

RELATIONSHIPS AMONG SELF-ESTEEM, PSYCHOLOGICAL AND COGNITIVE
FLEXIBILITY, AND PSYCHOLOGICAL SYMPTOMATOLOGY

Rawya M. Al-Jabari, B.A.

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APPROVED:

Amy R. Murrell, Major Professor
Randall J. Cox, Committee Member
Camilo Ruggero, Committee Member
Vicki Campbell, Chair of the Department of
Psychology
Mark Wardell, Dean of the Toulouse
Graduate School

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Previous findings on the relationship between self-esteem and psychological outcomes are inconsistent. Therefore it appears that self-esteem, while related to crucial variables, does not provide a clear, direct, and comprehensive prediction of psychological symptoms. Thus, it was hypothesized that the relationship between self-esteem and symptomatology would be moderated by broader measures of how one interacts with emotional and cognitive stimuli.

The purpose of this study was to examine the influence of self-esteem, psychological flexibility, and cognitive flexibility on psychological symptomatology. A sample of 82 undergraduate students at the University of North Texas completed self-report questionnaires measuring low self-esteem, psychological flexibility, measured inversely as inflexibility, cognitive flexibility, and psychological symptoms. Results of the study suggest that self-esteem ($\beta = -0.59, p < 0.001$) and flexibility (both psychological ($\beta = 0.36, p = 0.001$) and cognitive ($\beta = 0.21, p < 0.05$) are significant predictors of psychological symptoms. In other words, self-esteem is positively correlated with psychological symptoms, while psychological and cognitive flexibility are negatively correlated with psychological symptoms. Neither form of flexibility moderated the relationship between self-esteem and psychological symptoms in this sample. The findings of the current study are discussed as well as suggestions for further research related to self-esteem, psychological and cognitive flexibility, and their impact on psychological outcomes.

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CHAPTER 1

INTRODUCTION

Self-esteem is a heavily studied construct with more than 200 different scales and 15,000 empirical studies to investigate the construct (Scheff & Fearon, 2004). Crocker and Park (2004) stated that the “pursuit of self-esteem has become a central preoccupation in American culture” (p. 392). With this preoccupation comes a vast quantity of research: from school-wide initiatives to increase self-esteem in children, to the publishing of self-help books to maintain self-esteem in adulthood. The push to increase levels of self-esteem has to do with the positive mental health outcomes such as less anxiety, better adjustment, and enhanced self-regulation that are reported by many researchers (e.g. Benyamini, Leventhal, & Leventhal, 2004; Di Paula & Campbell, 2002; Makikangas, Kinnunen, & Feldt, 2004). Furthermore, individuals with high self-esteem rate their overall mental health higher, and perceive themselves to be healthier, than those with low self-esteem (Glendinning, 1998); thus, it is not surprising that low self-esteem, often co-occurs with symptoms of mental illness (Baumeister, et. al, 2003).

According to the National Institutes of Mental Health (NIMH), in 2008, 5% of the United States’ population was suffering from serious mental illness, excluding developmental and substance use disorders (World Health Organization [WHO], 2011). In addition to meeting diagnostic criteria for a mental illness according to the *Diagnostic and Statistical Manual of Mental Disorders (DSM-IV*; American Psychological Association, [APA], 2000), these individuals were limited in at least one major life activity. Additionally, in 2008, 58.7% of those with serious mental illness received treatment in the form of inpatient care, outpatient care, or psychotropic medication. Similarly, 13.4% of all individuals in the U.S. reported receiving treatment for mental health-related issues (WHO, 2011).

Given the relation between self-esteem and mental health, one can see how low self-esteem may not only lead to emotional costs, but to financial costs as well. These financial costs are measured directly and indirectly (Insel, 2008). Direct costs include medication, hospitalizations, and doctor visits. Indirect costs include reduction in labor for the economy, a decrease in degrees attained, and individuals requiring financial support from the government. Insel (2008) reported a total annual loss of earnings of \$193.2 billion for individuals with severe mental illness, and estimated an economic burden of those with severe mental illness to be close to \$317 billion annually.

It is understandable that society wants to improve mental health by enhancing self-esteem. An individual's quality of life may increase by decreasing mental health symptoms. This may then increase the number of individuals capable of working, or individuals choosing to gain further education, which in turn, helps to reduce economic costs to society. However, increased self-esteem is not the panacea to the abundance of mental health problems. There are inconsistent findings related to self-esteem research that make the relationship between self-esteem and psychological outcomes much more complicated. Although some findings suggest high self-esteem is beneficial and should be sought after (e.g., McFarlin & Blascovich, 1981), other research concludes that high self-esteem is associated with negative mental health related outcomes (e.g., Baumeister, Smart, & Boden, 1996). How could this be?

Perhaps the effects of self-esteem are context dependent. Perhaps self-esteem alone is not the only factor to mitigate negative health outcomes; instead, self-esteem may be beneficial when working with other factors to aid in healthy living. Psychological and cognitive flexibility promote healthy living by increasing awareness and encouraging adaptive coping skills (Dennis & Vander Wal, 2010; Kashdan & Rottenberg, 2010). Because of the mixed findings in the

relationship between self-esteem and psychological symptoms, flexibility may help clarify if the level of psychological symptoms changes given the same level of self-esteem as flexibility increases or decreases. As such, the current study proposed that psychological and cognitive flexibility would moderate the relationship between self-esteem and psychological symptoms, and investigated the impact of these variables on psychological symptoms.

Self-Esteem

William James (1890) first described self-esteem as an evaluative process. He argued that self-esteem could be measured as the ratio of one's successes to his or her pretensions. James (1890) defined pretensions as individuals' goals and aims, while their successes were defined as perception of attaining their goals. As such, self-esteem was conceptualized as fluctuating with respect to one's successes and failures. Many conceptualizations of self-esteem have emerged since the time of William James; quite a few of them refer to a similar evaluative process.

One of the most commonly used definitions of self-esteem is the understanding that it is an individual's positive or negative attitude toward his or her self as a whole (Rosenberg, 1979). Additionally, Rosenberg (1965) referred to self-esteem as the evaluation one makes towards the self in reference to self-worth, self-respect, and self-acceptance. Neff and Vonk (2009) describe self-esteem as an attitude toward oneself that is the result of an evaluative process in which personal abilities, performance, or characteristics are compared to the standards of others. If respect or approval of others is apparent, self-esteem is increased. As another view, Baumeister, Smart, and Boden (1996) succinctly define high self-esteem as a favorable global evaluation of oneself, with the term being synonymous to pride, egotism, arrogance, honor, and narcissism. Although many other definitions of self-esteem exist in the literature, the National Association for Self-Esteem (NASE; 2010) recognizes a general consensus that self-esteem is comprised of

cognitive, affective, and behavioral elements.

Self-Esteem and Similar Constructs

There are many constructs that are frequently studied and linked to self-esteem. Terms that commonly occur in literature searches, for example, are self-worth, self-efficacy, self-enhancement, and defensiveness. Because self-worth and self-efficacy are most directly relevant to the current study, these constructs will be discussed below. Thorough reviews of self-enhancement and defensiveness are beyond the scope of this paper. For an explanation of how self-esteem and self-enhancement overlap, see Brown, Collins and Schmidt (1998). These authors found that individuals with low self-esteem tend to avoid activities that would build a more positive view of themselves. Readers interested in defensiveness should refer to Jordan, Spencer, Zanna, Hoshino-Browne, and Correll (2003) who found that some individuals tend to deny low self-esteem and explicitly portray positive self-image and esteem while internally feeling bad about themselves. What is important to note about both of these studies - and about the constructs of self-enhancement and defensiveness, more broadly, - is characteristics associated with self related constructs may neither be clear nor generalizable to all situations and circumstances.

Self-worth, the value you place on yourself, is sometimes used interchangeably with self-esteem (Harter, 1999). Brown and Dutton (1995) found that in an undergraduate sample (N = 172), individuals' self-esteem influenced how ashamed and embarrassed they felt at failing an experimental task, rather than how happy or unhappy they were about failing or succeeding at the task. In the study, individuals with low self-esteem had lower feelings of self-worth when they failed in comparison to individuals with higher self-esteem who had also experienced failure. The individuals' self-esteems seemed to fluctuate with success or failure, which in turn

impacted the participants' self-placed value (Brown & Dutton, 1995). Self-evaluation seemed to be context dependent in this undergraduate sample, which is important to keep in mind when reflecting on the reported inconsistencies in the self-esteem literature.

Self-efficacy refers to an individual's belief about his/her specific abilities, while self-esteem relates to the broad feelings associated with one's self-worth (Sherer, Maddux, & Mercandante, 1982). Although both self-esteem and self-efficacy pertain to personality characteristics that are related to an individual's evaluation of him/her self or of personal ability in a specific context, the two constructs are distinct. Brockner (1998) also highlighted the distinctness of these two constructs by arguing that self-esteem concerns self-evaluations in a multitude of circumstances, while self-efficacy affects task-specific competence. Previous research indicates high self-esteem is correlated with high general self-efficacy and social self-efficacy (Sherer et al., 1982). For example, when an individual believes in himself or herself, he or she is more likely to regard him/her self highly and find personal worth (Brockner, 1979; Gist, & Mitchell, 1992; Kavanagh & Bower, 1985).

Though there are different types of self-efficacy, creative self-efficacy is focused on in this study. Creative self-efficacy is defined as "the belief one has the ability to produce creative outcomes" (Tierney & Farmer, 2002, p. 1138). The cognitive flexibility task in this study (discussed later) is creative in nature. It asks for divergent thinking and it was deemed more appropriate to measure self-efficacy in a way that was related to creative thinking, rather than a more general self-efficacy scale. Because of this, a creative self-efficacy measure was utilized and investigated in this study. There have been no published studies on the relationship between self-esteem and creative self-efficacy. However, in a presentation, Karwowski (2010), a researcher at the Academy of Special Education in Poland, reported a relationship between

creative self-efficacy and self-esteem. He developed and used the Creative Self Short Scale, which measures creative self-efficacy and found that individuals in his sample with higher levels of self-esteem (measured with the RSES) also had higher levels of self-efficacy $r = .32, p < .05$.

Understanding how these constructs relate to self-esteem as well as clarifying variants and levels of esteem may be highly beneficial. Kernis (2003) presented a theoretical perspective on optimal self-esteem. He stated that optimal and high self-esteem are conceptually different from one another. He described optimal self-esteem as the favorable feelings of self-worth that occur naturally when successfully dealing with life's challenges. This means that one is valued for who they are and not for what they achieve. Kernis (2003) theorized that high self-esteem fluctuated from being stable to unstable, and defensiveness may be disguised as high self-esteem, which adds to the instability of this type of measured self-esteem. Optimal self-esteem, on the other hand, is genuine, and stable, and it does not rely on self-evaluation.

Variables Associated with Self-Esteem

In addition to the variations in defining self-esteem, the literature is highly inconsistent in the reported effects of self-esteem on psychological symptoms (Jackson, 1984). Heilburn (1981) reports that high self-esteem is desirable and adaptive, potentially leading to positive adjustment (also see Taylor, 1989; Whitley, 1983). Individuals with high self-esteem believe they are intelligent, attractive, and popular (Baumeister, Campbell, Krueger, & Vohs, 2003), and some individuals with high self-esteem also appear to have higher self-confidence (McFarlin & Blascovich, 1981). High self-esteem is related to feeling included and being socially accepted by others (Crocker & Park, 2004). Additionally, individuals with high levels of self-esteem have less anxiety, in particular, less anxiety about death (Greenberg, Pyszczynski, & Solomon, 1986;

Solomon, Greenberg, & Pyszczynski, 1991), and they are less fearful of their vulnerability to death (Greenberg et al., 1993).

High self-esteem can be adaptive and useful in some contexts, however, in other contexts it is less helpful. Baumeister, Smart, and Boden (1996) report that individuals with a highly favorable self-appraisal are more likely to be violent, particularly when they feel threatened. For example, aggression emerged when an individual with high self-esteem received a less favorable appraisal from others (Baumeister, Smart, & Boden, 1996). This violence and aggression is used to self-enhance and self-promote the image of the violent individual at the cost of others (Baumeister, Tice, & Hutton, 1989). Further, Seligman (1995) argued that high self-esteem might be related to narcissism, self-absorption, and lack of concern for others. Importantly, Brown and Zeigler-Hill (2004) indicated the relationship between narcissism and self-esteem is found with specific self-esteem measures that relate self-esteem to dominance. When dominance is accounted for as a covariate in addition to the self-esteem measure, the relationship between self-esteem and narcissism is weak.

Additionally, Crocker, Thompson, McGraw, and Ingerman (1987) reported individuals with high self-esteem exhibit higher in-group preference, which may be related to more prejudice and discrimination. Furthermore, high self-esteem is associated with poor self-regulation (or the capacity to be aware and alter behavior) after a threat to an individual's sense of self (Baumeister, Smart, & Boden, 1996), delusional ideation (Colvin, Block, & Funder, 1995), pervasive self-serving biases (Blaine & Crocker, 1993), and the denial of responsibility for failure (Fitch, 1970).

Low self-esteem, on the other hand, seems to be consistently associated with less adaptive outcomes. Croaker and Luhtanen (2003) found that individuals with low self-esteem

reported more social anxiety, interpersonal difficulties, difficulties initiating and maintaining friendships, and feelings of social isolation. In addition, low self-esteem increases the likelihood of engaging in aggression, antisocial behavior, and delinquency (e.g., Donnellan, Trzesniewski, Robins, Moffitt, & Caspi 2005; Fergusson & Horwood, 2002; Sprott & Doob, 2000), perhaps making it more difficult to have social relationships with others. Blaine and Crocker (1993) reported that individuals with low self-esteem have negative self-concepts and are uncertain of how they view themselves. Further, individuals with low self-esteem report less academic achievement (Davies & Brember, 1999), poorer job performances (DiPaula & Campbell, 2002), more suicidal ideation in adulthood (Hirshfeld & Blumenthal, 1986), and provide fewer reasons for living in children 11 to 15 years old (Merwin & Ellis, 2004).

In children, adolescents, and the elderly, low self-esteem is related to depression and anxiety (Harter, 1999; Rosenberg, 1985, 1989; Rosenberg, Schooler, Schoenbach, & Rosenberg, 1995). For example, Civitci (2010) investigated the moderating role of global self-esteem on the relationship between life satisfaction domains (e.g., family, friends, and school) and depression in adolescents. Results of the study suggested that adolescents' (ages 11- to 15-years-old) self-reported self-esteem moderated the relationship between life satisfaction and depression within the sample. Furthermore, the more depressed an individual was, the lower they rated their familial satisfaction. The familial satisfaction relationship was found to be more significant in those with low self-esteem than in those with high self-esteem, indicating that self-esteem may act as a cushion between depression and family satisfaction (Civitci, 2010). Moreover, low self-esteem is related to perceived pessimism about the future and one's abilities and competence (Alicke, 1985; Brown, 1986; Campbell, 1986; Taylor & Brown, 1988). Individuals who endorse

low self-esteem report more negative future outlooks and have fewer beliefs in their efficacy and competence to achieve or attain desirable life pursuits.

Harter (1996) argued that values play an important role in self-evaluation. In order to experience “high self-esteem” one needs to feel competent in life areas that are self-determined to be important. Thus, high-self esteem from this perspective represents feelings of self-liking, respect and acceptance (Harter, 1996). For example, when individuals are unable to attain and behave in ways consistent with their values, alternate sources of action may be necessary to fulfill the need. Take an individual that values social interactions, if for some reason the individual could not fulfill their social interaction need/desire via physical contact with others, they may be inclined to find that interaction via different mediums of communication, like phone calls and social networking sites. To investigate this type of relationship, Ellison, Steinfield, and Lampe (2007) examined the relationship between Facebook use in undergraduate students and the formation and maintenance of resources accumulated through relationships with people, also known as social capital. Self-esteem and satisfaction at the undergraduate institute the participants were enrolled in were also measured to better understand how they relate to social capital. Researchers found that the undergraduates reporting low satisfaction and low self-esteem appeared to acquire the social benefits from relationships with others if they used Facebook more. These individuals found an alternate way to gain the social connection they desired through online social networking. However, there was little difference in acquiring social capital through using Facebook in students who reported high satisfaction and high self-esteem. Ellison, Steinfield, and Lampe suggest that in the context of low self-esteem, social capital is fulfilled via Facebook use. In the context of high self-esteem, Facebook use did not fulfill individuals’ social capital needs.

Context seems to be important in understanding the usefulness of self-esteem. For example, Brown (1986) reported individuals with high self-esteem believed they were superior to others in many different domains, and considered their futures brighter and more successful than others' (Taylor & Brown, 1988). This level of self-confidence may come off as egotism; however, it may be adaptive and necessary in some circumstances. In other words, high self-esteem may be associated with some constructs that may be perceived as positive (self-confidence), while others may be viewed as negative (egotism and narcissism) – or the qualities may change in valence depending on the context. Further, the degree to which an individual exhibits self-esteem may vary, and this may determine whether or not the associated outcomes are beneficial or problematic.

Although the research on the relationship between self-esteem and psychological symptoms is at times contradictory, the prevalence of these studies is not waning. Kernis (2003) argued that self-esteem is an important construct because it affects the way individuals feel about themselves. This then becomes an important component of an individual's environment and daily functioning. Due to the vast affect self-esteem has on a person's life, the quest for understanding its components is, and will likely continue, to be an important topic of interest.

Psychological Flexibility and Inflexibility

Another important concept in understanding the development of psychological symptoms is psychological flexibility. From an Acceptance and Commitment Therapy (ACT; Hayes, Strosahl, & Wilson, 1999; 2012) construal, psychological flexibility is an individual's ability to fully connect with the present moment and to behave in ways consistent with one's identified values. An individual's behavior can become the inverse, psychologically inflexible, when behaviors hinder contact with the present moment or with identified values (Hayes et al., 2012).

A Model to Assess and Promote Psychological Flexibility: ACT

ACT delineates six core processes that work together to promote psychological flexibility: acceptance, defusion, contact with the present moment, self-as-context, valuing, and committed action. Acceptance is the active and conscious willingness to experience private events, such as thoughts, feelings, bodily sensations, and the situations that evoke them, without attempting to change their form and frequency. Acceptance occurs along a continuum, with experiential avoidance at the opposite end. Experiential avoidance is an unwillingness to experience negatively evaluated (or otherwise uncomfortable) internal or external events as they are. Defusion entails detachment from unhelpful thoughts or other private events like feelings. The intended goal is to change the function of the private events so that they no longer rigidly influence behavior, while being careful not to alter the content or frequency at which those private events occur. Contact with the present moment refers to experiencing the world as it occurs, whether in the form of psychological or environmental events. Self-as-context refers to perspective awareness that one's self is separate from thoughts, feelings, and experiences. Values can be described as life directions that help guide our short-term and lifelong actions. Finally, committed action involves engaging in behavior that is consistent with identified values, regardless of the internal psychological or external barriers. By engaging in these six core processes, an individual is considered to be psychologically flexible (Hayes et al., 2012).

According to the ACT model, the six processes are not mutually exclusive; instead they are intertwined and overlap (Hayes et al., 2012). Thus, measuring one ACT-related process is difficult because of this overlap. Instead, much of the current research on maladaptive functioning tends to use measures of experiential avoidance as a proxy for psychological inflexibility (see Hayes et al., 2004, 2006 for a review). To measure experiential avoidance,

researchers have used different versions of the Acceptance and Action Questionnaire (AAQ), with the most recent version being the AAQ-II (Bond et al., 2011), the Avoidance and Fusion Questionnaire for Youth (AFQ-Y; Greco, Murrell, & Coyne, 2005), the Multidimensional Experiential Avoidance Questionnaire (MEAQ; Gamez, Chmielewski, Kotov, Ruggero, & Watson, 2011), as well as other disease and disorder specific measures like the Acceptance and Action Diabetes Questionnaire (AADQ; Gregg, Callaghan, Hayes, & Glenn-Lawson, 2007), and the Chronic Pain Acceptance Questionnaire (CPAQ; McCracken, Vowles, & Eccleston, 2004), to name a few. This study used the AFQ-Y as a measure of psychological flexibility. Although the name suggests it only measures experiential avoidance and fusion, because the core processes overlap, it has been shown to be a reliable and valid measure of psychological flexibility, or inflexibility, with an adult sample of university students (Schmalz & Murrell, 2010).

Variables Associated with Psychological Flexibility and Psychological Inflexibility

The use of experiential avoidance and acceptance measures has led to a mass of research on the correlates of these constructs, both positive and negative. For instance, there are benefits to being psychologically flexible that have been found in employment settings. Bond and Bunce (2003) reported that individuals with higher levels of psychological flexibility have better job performance over a one-year interval. In addition, Bond and Flaxman (2006) found that job control and psychological flexibility predicted employees' ability to learn, their mental well-being, and their job performance.

Psychological flexibility also benefits physical health and overall mental health. Feldner et al. (2006) found that individuals who were psychologically flexible showed a higher pain tolerance and a faster recovery period when they felt distressed. Undergraduate participants reported their level of flexibility using the AAQ and then completed a cold pressor task.

Participants were told to tell experimenters when they felt discomfort during the cold pressor task. Feldner and colleagues found that those that reported higher levels of experiential avoidance displayed lower levels of pain tolerance than the individuals that had lower levels of avoidance. Furthermore, McCracken, Vowles, and Eccleston (2005) found improvements in emotional, social, and physical functioning in their sample of individuals with complex chronic pain after an ACT intervention aimed at increasing psychological flexibility.

Ciarrochi, Bilich, and Godsel (2010) report that strengthening psychological flexibility through ACT improved mental health, well-being, and increased values-consistent behavior. Similarly, in a clinical trial of individuals with social anxiety, greater psychological flexibility was related to less distress and less impairment in daily functioning (Dalrymple & Herbert, 2007).

Impairment in daily functioning is one of the negative consequences often associated with psychological inflexibility. Psychological inflexibility has been linked with depression, anxiety, trauma, and other disorders (Hayes et al., 2004; Hayes, Luoma, Bond, Masuda, & Lillis, 2006). In depression, psychological inflexibility is often presented as a type of rigidity, associated with rumination and worry (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). A similar inability to interact with emotion has been found in at least one study conducted with individuals with generalized anxiety disorder (GAD). McLaughlin, Mennin, and Farach (2007) investigated emotional impulses and experiential avoidance among individuals with GAD as compared to controls. Results revealed that the individuals with GAD in a worry induction condition expressed more intense sadness than the control group when asked to view a sad movie clip. The researchers concluded that the individuals with GAD had a more difficult time

understanding, accepting, and managing their emotions as compared to the individuals in the control group.

Orcutt, Pickett, and Pope (2005) investigated the relationship between experiential avoidance, forgiveness, and trauma in a sample of undergraduate students who reported interpersonal distress. They found that individuals that reported more experiential avoidance also reported higher posttraumatic symptomology. Further, individuals that reported more forgiveness reported less posttraumatic symptoms. The way in which the individuals in the study related to the traumatic experience they experienced impacted their reported symptomology.

In clinical trials for borderline personality disorder treatment, participants who lacked psychological flexibility were more likely to have poor outcomes, terminate treatment earlier, and show a slower reduction in depressive symptoms (Berking, Neacsiu, Comtois, & Linehan, 2009). Success of treatment of several disorders that involve impulsive behavior likely depends on level of experiential avoidance, because - for example - level of substance use, eating disorders, and self-injurious behavior are all related to experiential avoidance, or psychological inflexibility (Howe-Martin, Murrell, & Guarnaccia, 2012).

Another good example of this relationship between impulsive behavior and experiential avoidance is trichotillomania. Begotka, Woods, and Wetterneck (2004) found that in individuals diagnosed with trichotillomania, higher reports of experiential avoidance were related to the severity of trichotillomania, the greater frequency and intensity of the urges to engage in the impulsive behavior. In both Berking and colleagues' (2009) study and Begotka and colleagues' (2004) study, inflexibility and avoidance seem to play an integral role in the maintenance of psychopathology. In addition to the aforementioned psychological issues, inflexibility is associated with poor attentional control in Attention Deficit-Hyperactivity Disorder (ADHD;

Barkley, 1997), and a disinhibited response style in substance abuse (Iacono, Carlson, Taylor, Elkins, & McGue, 1999).

Psychological Flexibility and Similar Constructs

According to Kashdan and Rottenberg (2010), psychological flexibility has been researched under different names like ego-resiliency, executive control, and self-regulation. These authors report that psychological flexibility is a comprehensive process that includes how a person changes his/her behavior based on context, optimizes the use of mental energy, shifts perspectives, and balances different wants, needs, and life roles and responsibilities. Previous terminologies have typically referred to some part of this umbrella construct. Ego-resilience, for example, is adapting one's inhibition and/or expression of impulses based on the current situational contexts (Block, 2002). Executive control is more limited as it always refers to the inhibition of an inappropriate response in a context that may elicit the response (Posner & Rothbart, 1998). The idea of self-regulation, on the other hand, is broader. Baumeister and Vohs (2007) state that self-regulation is one's ability to change his or her own behaviors to accommodate social and situational needs. In summary, all of these constructs are similar because they involve flexible response patterns to changing internal (thoughts, feelings, physical sensations, and memories) and external environments. The constructs could all be considered as some type of coping or emotion regulation strategy, and psychological flexibility is the generalized process that subsumes them. This flexibility, from an ACT perspective, does not include attempt to change or control the private events or environment (unless that is "workable"). Instead the goal is typically to accept what is presented, and continue to act in the service of personally chosen values.

Self-Esteem and Psychological Flexibility

Little research has been done on the relationship between self-esteem and psychological flexibility. However, Dykman (1998) studied the relationship between self-esteem and approach versus avoidance coping. As previously noted, psychological flexibility is often measured with experiential acceptance (or avoidance) measures; and, experiential avoidance appears to be an umbrella construct that includes avoidant coping (Kashdan, Barrios, Forsyth, & Steger, 2006). Thus, this study is of note. Results of Dykman's study indicated that the need to avoid feeling incompetent, unlovable, and the like - as well as the need to be externally validated – not only results in high self-esteem, but also in high levels of anxiety.

This seeming paradox can be explained by considering a hypothetical client with anxiety. Assume a college student seeks therapy because she feels she does not have many close relationships. She completes a self-esteem measure given to her by the intake clinician without raising any concern; however, her score on the anxiety measure is quite high. When asked about why she has come in for treatment, she says she wants a romantic relationship and more friendships. She also says that she only leaves her dorm room to go to class and that she does not speak to anyone in class. When asked why she does not talk to others, or go out, the client says she is worried she will look and sound stupid. When asked for more details about this, the client gets a bit defensive. She says she feels fine about herself. She talks about her good grades, her reassuring family members and how much they love her, and she mentions her one good friend since childhood who always tells her how smart and nice she is. She then says she is enrolled in psychology and she knows her staying in is avoidance and that her behavior is being reinforced because it helps her not feel anxious but that she really does want help!

Returning to the ACT model, it is evident how self-esteem is related to fusion and contact with the present moment for this client. She has become fused with the thought “I will sound stupid,” and this is very uncomfortable for her. So, she spends a good deal of time and effort doing things to avoid that thought and other painful thoughts and feelings. It is hard to remain in contact with the present moment, and to respond to current environmental contingencies under those circumstances. Her current behavior patterns have created barriers, preventing her from behaving in a flexible manner consistent with her value of meeting more people. With similar cases, clinicians and clinical researchers would work with individuals teaching them defusion techniques aimed at promoting psychological flexibility and decreasing barriers. While there are some published studies on social anxiety (e.g., Dalrymple & Herbert, 2007; Ossman, Wilson, Storaasli, & McNeill, 2006) at present, there are no published studies (of which this author is aware) that examine the relationship between self-esteem and psychological flexibility as described.

In this limited area of research, the way in which self-esteem and psychological flexibility relate has been understood and studied is through the use of acceptance and cognitive defusion. Hinton and Gaynor (2010) enhanced psychological flexibility in undergraduate students through cognitive defusion techniques. They aimed to shift the way individuals related to their negative thoughts without trying to change the content of the thoughts. Participants were randomly assigned to a cognitive defusion or a waitlist condition. Those in the cognitive defusion condition engaged in three, weekly one-hour, individual treatment sessions over the course of three weeks, along with 30-minute pre-, post-, and one-month follow up assessment sessions. The researchers found that individuals in the cognitive defusion condition experienced greater changes in their reported self-esteem, psychological symptoms, ability to take actions

despite having uncomfortable thoughts and feelings, and frequency of negative self-statements. The individuals in the cognitive defusion condition also reported a significant decrease in their negative thinking. Negative thinking was related to negative mood, emotional distress, and low self-esteem. The associations between the individual and the negative thoughts were weakened by the cognitive defusion techniques, which led to a reduction in negative thinking and internalization of negative thoughts.

In a similar study aimed at teaching cognitive fusion techniques, Masuda and colleagues (2009) investigated whether the duration of word repetition modified the discomfort and believability of negative self-referential thought. One way to defuse from thoughts is through vocalization. Rapidly repeating a thought or singing it out loud are two ways to defuse from thoughts. Rather than engage in weekly therapy sessions like in Hinton and Gaynor's study, individuals learned cognitive defusion techniques. The individuals in the study chose a negative self-relevant thought that was later turned into one word, for example, "I am stupid" turned into, "stupid." Then, each individual rated his/her emotional discomfort and then believability of the thought using a Likert-like scale that ranged from 0 (*not at all uncomfortable/believable*) to 100 (*very uncomfortable/believable*). Afterwards, the participants were randomly assigned into one of three conditions: cognitive defusion rationale training, cognitive defusion rationale training plus three second repetition, and cognitive defusion rationale training plus 20 second repetition. The researchers found that individuals in the rapid repetition condition reduced their believability and emotional discomfort to the thought when the defusion rationale was explained to them and they had brief training in defusion. The impact of word believability, but not emotional discomfort, varied across the three second repetition group and the 20 second repetition group. Masuda et al. (2009) concluded that the believability and emotional discomfort associated with

negative or disturbing thoughts could be reduced through rapid repetition. Furthermore, the time difference was associated with reduction in believability and emotional discomfort.

Zettle and Hayes (1986) conducted a randomized clinical trial comparing ACT and cognitive therapy. They reported that after 12 sessions of ACT for individuals with depression there was a significant decrease in the frequency of negative thoughts, which was similar to the individuals that received cognitive therapy. It is suggested that the psychological flexibility promoted by ACT was associated with a decrease in the frequency of negative thoughts. While ACT is not aimed to decrease the number of negative thoughts an individual experiences, symptom reduction does sometimes occur in the process of becoming more psychologically flexible as seen in the previously mentioned studies (Hinton & Gaynor, 2010; Masuda et al., 2009; Zettle & Hayes, 1986).

Although the authors of these studies (Hinton & Gaynor, 2010; Masuda et al., 2009; Zettle & Hayes, 1986) did not use the terminology “self-esteem,” the self-referential content selected for investigation and manipulation (both positive and negative thoughts) can be viewed in a similar fashion as the self-esteem construct. Self-esteem is thought to be the understanding of one’s self as a whole through positive and negative attitudes (Rosenberg, 1979). Individuals who regard themselves with positive attitudes are thought to have high self-esteem while others with negative attitudes about themselves are viewed to have low self-esteem.

Cognitive Flexibility

A different form of flexibility is cognitive flexibility. It generally refers to an individual’s ability to shift cognitive sets and adapt to one’s changing environment (Dennis & Vander Wal, 2010). Martin and Anderson (1998) reported that cognitive flexibility is comprised of three steps: awareness, willingness, and self-efficacy. An individual needs to be aware that given situations

provide options and alternatives from which to choose. Next, one needs to be agreeable to such adaptations, in multiple given situations. Finally, an individual needs to believe that he/she has the capacity to be flexible in any given situation. When an individual is not flexible, they are considered cognitively rigid. This generally refers to an individual maintaining a fixed thought process, attribution, or relationship (Scott, 1962).

The different measures utilized to measure cognitive flexibility range from self-report questionnaires, to performance-based tasks that require shifting one's attention and being flexible while rules change for a task. Frequently, research has used the following assessments to study cognitive flexibility: Alternate Uses Test (Wilson, Christensen, Merrifield, & Guilford, 1975), Cognitive Flexibility Inventory (Dennis & Vander Wal, 2010), the Cognitive Flexibility Scale (CFS; Martin, & Rubin, 1995), Stroop Color and Word Test (Golden, 1975), Trail Making Test Part B (TMT; Reitan, & Wolfson, 1993), Wisconsin Card Sorting Test (WCST; Berg, 1948). Psychometric information on such measures is difficult to gather. Dennis and Vander Wal (2010) reported the internal consistency of the CFS ranges from .76 to .77 with a test re-test reliability of .83, while Fals-Stewart (1992) reported that it is difficult to establish reliability estimates on tasks such as the Trail Making Test because of practice effects typically found in performance-based tasks.

There are some benefits to being cognitively flexible that span increased attentiveness to benefiting social interactions. Cegala (1981) indicated that individuals who are more cognitively flexible are more attentive, perceptive, and more responsive to social interactions than those who have less flexibility. Further, O'Keefe and Delia (1982) reported that those individuals who are more cognitively flexible are able to generate more hypotheses about how social interactions should progress; this then makes flexibility a component of effective social communication.

Martin and Anderson (1998) found that cognitive flexibility was significantly related to an individual's level of assertiveness and responsiveness in social settings. Participants filled out the Assertiveness-Responsiveness Measure and the Cognitive Flexibility Scale. The researchers found that individuals with a higher level of cognitive flexibility adapted more easily to their social environment and had more self-confidence while adapting to their situations than those who were less cognitively flexible.

Davis and Nolen-Hoeksema (2000) found some negative consequences related to being cognitively inflexible. They were interested in the relationship between rumination and cognitive inflexibility. Sixty-two individuals rated their level of rumination and were given the WCST. They found that individuals who ruminated were more likely to make perseverative errors on the WCST, and had more difficulty maintaining a set than individuals that did not report ruminative tendencies. Results suggest that perseveration may exacerbate unhelpful thoughts in individuals that are prone to ruminate. Additionally, Miranda and colleagues (2012) investigated the relationship between cognitive inflexibility and suicide attempts in individuals with and without a history of suicide attempt. They found that for individuals with a past history of suicide attempt, perseverative errors on the WCST predicted future suicidal ideation at a 6-month follow-up even after controlling for mood and anxiety diagnoses, hopelessness, and a baseline for suicidal ideation. Therefore, cognitive inflexibility in individuals with a history of suicidal attempts could be dangerous, and clinical researchers and clinicians need to be aware of this phenomenon.

Because cognitive inflexibility can have potentially dangerous outcomes, increasing flexibility may be beneficial. In effort to experimentally increase individuals' cognitive flexibility, Leung et al. (2012) had participants physically enact various metaphors before or

during attempts to solve different types of creative tasks. In five different studies, participants were asked to act out different metaphors such as “thinking outside the box,” “on one hand, then on the other hand,” and “put two and two together.” For example, participants were asked to hold out different hands to represent “on one hand, then on the other hand,” sit inside or outside of a box to represent “thinking outside the box,” and combine two objects to represent “put two and two together.” Participants did these tasks either before or during attempts to solve varying convergent or divergent tasks. Convergent tasks refer to an individual solving a task by coming up with the best or most creative solution, while divergent thinking tasks involve fluency (number of ideas), flexibility (ideas varying from each other), and originality (novelty; Leung et al., 2012). Overall findings suggested that by enacting the physical acts, individuals could overcome mental fixedness and rigidity. Participants in the metaphor enactment groups exhibited higher convergent and divergent thinking in the various creative tasks presented, suggesting that cognitive flexibility may be experimentally improved (Leung et al., 2012).

Cognitive Flexibility and Similar Constructs

Cognitive flexibility has been investigated under different names, such as open-mindedness, quick learning, and restructuring (Timarova, 2011). These terms refer to an individual’s ability to seek novel solutions to problems and be adaptive in various situations, which is the essence of cognitive flexibility. Another construct similar to cognitive flexibility is functional fixedness. Functional fixedness refers to an individual’s inability to inhibit using an object in one function due to its recent use in another function (Dunker, 1945). For example, one is functionally fixed when they are unable to notice they can use a cup as a pencil holder after seeing someone drink from a cup. Generally, in functional fixedness tasks, individuals must use familiar objects in a novel way to successfully solve a task.

Dunker (1945) developed the candle task to test functional fixedness. In the candle task, individuals are asked to mount three candles vertically on a screen with a number of objects lying in front of them on a table. The solution is to mount the candles to the box by melting wax on the box and sticking the candle to it, then to tack the boxes to the screen. Those individuals who solved the problem fastest were the ones identified as least functionally fixed. Additionally, Frank and Ramscar (2003) were able to successfully use written descriptions of the task to assess for functional fixedness, rather than having the objects on the table as was in the original task. The construct of functional fixedness, or cognitive inflexibility, has been researched in areas of problem solving, concept formation, decision making, and creative thinking (Taylor & McNemar, 1955).

Self-Esteem, Self-Efficacy and Cognitive Flexibility

The research relating cognitive flexibility and self-esteem is limited. There are some similarities between cognitive flexibility, self-efficacy, and self-esteem. Theoretically, self-efficacy is discussed when referring to cognitive flexibility because the two constructs are interconnected. Self-efficacy is the belief one has about his/her ability (Sherer et al., 1982). In Martin and Anderson's (1998) three part definition of cognitive flexibility, the individual may be able to recognize the alternatives in a given situation, but may not engage in alternate behavior unless they are confident in their own ability related to the behavior, i.e., self-efficacy. The belief in oneself to accomplish a given task could overlap with the definition of self-esteem, an individual's positive or negative attitude toward his or her self as a whole (Rosenberg, 1979). In any given context, one's belief in completing a task could be related to how an individual feels about his/herself. For example, Martin and Anderson (1998) assessed individuals' ($N = 101$) level of cognitive flexibility and their confidence in various social communication contexts. The

confidence scores were used as measures of self-efficacy in terms of an individual's belief in their ability related to social communication. They found people who are more cognitively flexible are also more confident in a variety of social communication tasks. That is, more flexibility was related to more self-efficacy in a communication task. It would have been interesting to see the self-esteem played in this relationship, as it has not been investigated in the current literature.

For the current study, due to the creative nature of the cognitive flexibility task used, the relationship between cognitive flexibility and creative self-efficacy was investigated. No reported research has compared the two constructs. Further, to date, it appears that no published research has neither investigated the relationship between psychological and cognitive flexibility, nor the role that self-esteem may play in that relationship.

Psychological Flexibility and Cognitive Flexibility

It appears that the relationship between cognitive flexibility and psychological flexibility (or inflexibility) has yet to be explored in the literature. Theoretically, it is expected that the two constructs are related because the constructs are similar. Specifically, it may be that both psychological and cognitive flexibility are two aspects of a more general type of flexibility. Cognitive flexibility deals with an individual's ability to adjust his or her problem solving plan as the demands of the task change. In an ACT model, psychological flexibility refers to an individual's ability to engage in behaviors that are consistent with one's identified values while being fully connected with the present moment (Hayes et al., 1999). Both constructs require that an individual be connected to the present moment in order to adapt and behave appropriately in the present situation. In essence, the way in which a flexible individual behaves is contextually based.

Psychological Symptomatology

When individuals are in a state of distress, one way to adapt to the changing environment is by developing psychological symptoms (Fortin, Hudon, Bayliss, Soubhi, & Lapointe, 2007). Distress can be related to difficulties in coping with everyday problems or making everyday decisions, as well as poor self-care and avoidance of stressful events (Fortin et al., 2007). There are a number of ways to measure the severity of individuals' psychological symptoms. Objective and projective self-report measures are the most widely used methods in the social and behavioral sciences for understanding an individual's psychological functioning. This study used a general psychological health self-report assessment to assess individuals' psychological symptomatology, the Symptom Checklist- 90 Revised (SCL-90-R). The 90-item measure allows for assessment in the following areas: somatization, obsessive-compulsive disorder, interpersonal issues, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism. As such, a review of the literature in these domains is provided below.

Somatization disorder consists of an individual reporting a lifetime history of at least four unexplained pain complaints (e.g., in the back, chest, joints), two unexplained non-pain gastrointestinal complaints (e.g., nausea, bloating), one unexplained sexual symptom (e.g., sexual dysfunction, irregular menstruation), and one pseudoneurological symptom (e.g., seizures, paralysis, numbness; APA, 2000). The physical symptoms cannot be attributed to medical conditions or to the use of drugs. The differential lifetime prevalence for somatization disorder is 0.2 to 2% in women and less than 0.2% in men. Somatization disorder is found to co-occur with major depression (Morrison & Herbstein, 1988; Tomasson, Kent, & Coryell, 1991; Swartz, Blazer, George, & Landerman, 1988) and Axis II personality disorder diagnoses (Morrison, 1989; Rost, Akins, Brown, & Smith, 1992; Stern, Murphy, & Bass, 1993). Research suggests

that an individual's degree of emotional distress and functional impairment is related to the number of unexplained physical symptoms (Katon et al., 1991).

Tull, Gratz, Salters, and Roemer (2004) investigated the relationship between experiential avoidance, posttraumatic symptom severity and psychological health, including depression, anxiety, and somatization. They found that experiential avoidance was associated with somatization disorder when controlling for posttraumatic symptoms in the sample. Avoiding internal experiences may be a factor in the presence of psychiatric symptoms in individuals exposed to traumatic events. Much of the research on somatization and cognitive flexibility describes how cognitive-behavioral therapy can be used to treat the disorder (Kroenke & Swindle, 2000; Martin, Rauh, Fichter, & Rief, 2007). However, further research is needed to investigate the relationship between one's level of cognitive flexibility and the course of somatization disorder.

Obsessive-compulsive disorder (OCD) is characterized by the presence of intrusive thoughts (obsessions) that produce anxiety and/or repetitive acts either physical or mental (compulsions) in order to reduce the anxiety caused by the obsessions (APA, 2000). OCD usually begins in adolescence or early adulthood, with males developing the disorder earlier than females. It has been shown to have a lifetime prevalence of 2.5% and a one-year prevalence of 0.5% to 2.1% in adults (APA, 2000). Neurological research proposes that the pathogenesis of OCD lies in the anatomy of the brain (Insel, 1992; McGuire, 1995). However, behavioral and cognitive theories regard OCD as a psychological disorder based on learning processes (Derisley, Libby, Clark, & Reynolds, 2005). Interventions for OCD include cognitive-behavioral therapy (CBT) and pharmacotherapy with serotonin reuptake inhibitors (SRIs; Lewin, Storch, Adkins, Murphy, & Geffken, 2005). Abramowitz, Lackey, and Wheaton (2008) argue

that experiential avoidance is a main characteristic of OCD. These researchers conducted the first empirical study investigating the relationship between experiential avoidance and obsessive and compulsive behaviors. They found that a group high on obsessions and compulsions had greater levels of experiential avoidance and obsessive beliefs than individuals in the low obsession and compulsions group. However, they reported that experiential avoidance did not explain OCD symptoms more than cognitive behavioral concepts. Chamberlain, Fineberg, Blackwell, Robbins, and Sahakian (2006) used the WCST to assess cognitive flexibility in a sample of people with OCD, trichotillomania, and healthy controls. They found that individuals with OCD had a more difficult time completing the WCST. They argued these participants had lower cognitive flexibility than both the individuals with trichotillomania and the healthy controls.

Interpersonal problems are described as recurrent difficulties in relating to other individuals (Horowitz, Rosenberg, & Bartholomew, 1993). The most common self-report measure of these difficulties is the Inventory of Interpersonal Problems (IIP; Horowitz, Alden, Wiggins, & Pincus, 2000). One way to better understand interpersonal problems is through the psychodynamic perspective. A psychodynamic conceptualization of interpersonal problems relates maladaptive relationship patterns to a defensive effort to avoid anxiety and protect one's self-image (Horowitz, Rosenberg, & Bartholomew, 1993). Horowitz and colleagues reported that a way of treating interpersonal problems is exploring the issues, clarifying the conflict, and then helping the individual role play alternative behaviors. It is also posited by Horowitz et al. (1993) that those who are more cognitively flexible have less interpersonal problems. Shih, Farn, and Ho (2008) report that interpersonal difficulties create a cognitive load on individuals and decrease one's ability to be cognitively flexible and think creatively.

Major depressive disorder (MDD) consists of feelings of sadness, despair, and

discouragement over a two-week period. There is a loss of interest or pleasure, a sense of failure, a lack of activity, feelings of guilt, low self-worth, disturbed sleep and/or appetite, low energy, and poor concentration (APA, 2000). The lifetime risk of developing major depressive disorder is between 10% to 25% for women, and 5% to 12% for men. Empirical studies on the cause of depression support the diathesis-stress model that suggests vulnerable individuals are more likely to become depressed when they are unable to cope with their environment or external stressors (Hammen & Garber, 2001). Some psychological theories make an effort to change and manipulate dysfunctional cognitions and behaviors (Beck et al., 1979) or focus on the disordered brain processes (Delgado & Moreno, 1999) in order to ameliorate the effects of depression.

From an ACT perspective, depression and its symptoms serve a function in an individual's life. Understanding the function of depression and changing an individual's behaviors in order to behave consistently with one's values is important in living a meaningful and fulfilling life. Furthermore, Zettle and Hayes (2002) report depression becomes pathological due to experiential avoidance and cognitive fusion and is not necessarily due to the thoughts or feelings themselves. There has been some research investigating the relationship between cognitive flexibility and the severity of depression. It has been found that individuals with MDD are cognitively inflexible, engage in behaviors such as rumination, and have more rigid thoughts (Deveney & Deldin, 2006). Much of the research with individuals with MDD suggests a decrease in cognitive flexibility because of impairments on the WCST (Austin, Ross, O'Carrol, Ebmeier, & Goodwin, 1992; Grant, Thase & Sweeney, 2001; Kindermann, Kalayam, Brown, Burdick, & Alexopoulos, 2000).

Generalized anxiety disorder (GAD) is marked by excessive worry, apprehension, tension, and anxiety about multiple activities for at least six months (APA, 2000). Additionally,

there is a one-year prevalence rate of 3%, and a lifetime prevalence rate of 5% for developing GAD (APA, 2000). Bourland and colleagues (2000) reported that older adults with GAD report a diminished quality of life. Massion, Warshaw, and Keller (1993) reported that adults with GAD in a psychiatric population also reported a diminished overall quality of life. Massion et al. (1993) found their sample reported poor emotional health, mild to moderate overall functioning impairment, and impaired social functioning. Furthermore, individuals with GAD reported personally significant impairment in their work and social roles (Henning, Turk, Mennin, Fresco, & Heimberg, 2007).

From an ACT perspective, GAD is maintained due to experiential avoidance, behavior restriction, and cognitive fusion with internal experiences (Hayes, Orsillo, & Roemer, 2010). Hayes et al. (2010) investigated whether helping individuals be more accepting of their internal experiences increased their engagement in behavior consistent with their values. They found that acceptance-based therapy increased the amount of time individuals spent accepting internal experiences and engaging in values consistent behavior. Participants also reported an increase in quality of life. There has been little to no research published on the relationship between cognitive flexibility and GAD. Much of the research compares the efficacy of cognitive therapy, or other types of therapies, on the reduction of symptoms in GAD (Barlow et al., 1984; Blowers, Cobb, & Mathews, 1987; Butler, Fennell, Robson, & Gelder, 1991).

Some researchers question the definition of hostility or anger. Smith (1992) reported a conceptual disagreement in the literature about the definition of hostility due to an unclear distinction between affect, behavior, and cognition. He defined hostility as a set of negative attitudes, beliefs, and judgments that relate to other people; these then make an individual believe that other people are untrustworthy and disloyal. Another popular definition defines hostility as

an affinity to desire harm on others, or feel anger towards others (Chaplin, 1982). Much of the research amassed in the area of health and hostility indicates there is a relationship between hostility and coronary heart disease and general mortality (Barefoot, Dodge, Peterson, Dahlstrom, & Williams, 1989; Chesney & Rosenman, 1985; Friedman, 1992; Johnson, 1990; Miller, Smith, Turner, Guijarro, & Hallet, 1996; Rozanski, Blumenthal, & Kaplan, 1999; VanderVoort, 1995). Conceptually from an ACT perspective, hostility may be indicative of experiential avoidance, although further research is needed due to conflicting findings.

Kashdan, Breen, Afram, and Terhar (2010) investigated the relationship between experiential avoidance, autobiographical memories relating to social anxiety, depression, and anger symptoms. The authors had undergraduate students recall experiences in which they felt curious, grateful, and anxious. The participants also completed various questionnaires relating to depression, anger, anxiety, experiential avoidance, and emotion regulation prior to the autobiographical memories task as well as at a three-month delay. They found that experiential avoidance was positively related to recalling autobiographical memories with people with social anxiety. However, experiential avoidance was not related to the expression of anger in this sample. The authors report they may not have found a relationship between experiential avoidance and anger because they relied on memories of anxiety in individuals. Unlike the previous study, Tull, Jakupcak, Paulson, Gratz (2007) investigated the aggressive behaviors in college students who have been exposed to interpersonal violence. They were interested in determining if experiential avoidance and emotional inexpressivity predicted if an individual engaged in aggressive behavior. The researchers found that both experiential avoidance and emotional inexpressivity significantly accounted for the amount of aggressive behavior one engaged in, above and beyond trait levels of anger. Thus, higher levels of experiential avoidance

and emotional inexpressivity are related to higher levels of aggression. The researchers propose that if an individual attempts to avoid their angry emotions, they may exacerbate the emotions and lead to more aggressive behaviors. With regard to cognitive flexibility, De Dreu and Weingart (2003) studied the level of flexibility in terms of social interactions. They reported that when individuals were in hypothetical hostile negotiation situations, they were more likely to exhibit cognitive inflexibility and less creative thinking than when they were not put in hostile situations that required negotiations. Thus, the addition of hostility increases the likelihood of cognitive inflexibility.

Phobic anxiety consists of individuals that present a fear that is excessive or unreasonable. This fear, which is cued by the presence or anticipation of the specific object or situation, interferes with their daily living (APA, 2000). For example, some phobias include a fear of flying, animals, or social situations. Another form of anxiety, social anxiety, involves social contexts and is defined as: the extreme fear of embarrassment or humiliation in social situations, which usually leads to avoidance of situations (APA, 2000). The adult lifetime prevalence of specific phobias range from 7.2 to 11.3%; however, prevalence for social anxiety ranges from 3 to 13% (APA, 2000). Dalrymple and Herbert (2007) conducted a pilot study where they used standard exposure-based treatment for social anxiety with ACT in a sample of individuals diagnosed with social anxiety disorder. In Dalrymple and Herbert's (2007) study, ACT consisted of learning how to experience fears and anxiety without trying to avoid them, in the service of behaving consistently with their values. They found that the individuals in the pilot study became willing to experience their once avoided private events. Additionally, individuals reported a decrease in avoidance behaviors compared to a reduction of their fear of the situation and private event; they were more likely to behave consistently with their values, regardless of

how they felt. Furthermore, the link between social anxiety and cognitive flexibility has not been investigated on its own, but it has been studied in individuals with schizophrenia. Lysaker and Hammersley, (2006) hypothesize that social anxiety found in those with schizophrenia is associated with cognitive inflexibility; people that are inflexible cannot adjust and adapt to the change in social situations and may then fear and avoid them. Impairments in the flexibility of abstract thoughts may lead to social anxiety in individuals who have schizophrenia, which then leads to misinterpretation of emotions and meanings in social interactions.

Paranoid ideation refers to individuals having thoughts that others are going to inflict harm on them or kill them. They are also related to feelings of deception, disloyalty, suspicion, and mistrust. Much of the research on paranoia incorporates some aspect of psychoticism, such as schizophrenia. Psychoticism, as Eysenck (1992) refers to it, is a trait representing impulsive behavior and unusual emotional expression. However, psychoticism may also be conceptualized by an individual experiencing visual and/or auditory hallucinations or delusions that lead to impaired insight. Bach and Hayes (2002) conducted brief therapy with inpatient individuals with psychotic experiences. Although an increase in symptoms was reported, after four ACT sessions, they found reductions in psychotic symptom believability and rehospitalization rates in individuals that received ACT treatment. ACT was used to increase psychological flexibility in individuals with psychotic symptoms. One component of paranoid ideation is the tendency to jump to conclusions. Interestingly, Freeman, Pugh, and Garety (2008) found that this combination (paranoid ideation and jumping to conclusions) may not lead to cognitive inflexibility, but further research is needed to investigate the relationship between cognitive flexibility and paranoid ideation.

Due to the broad range of symptoms, there is considerable comorbidity in psychological symptoms among disorders. Additionally, the classification system used, the DSM-IV-TR, separates disorders based on operationalized diagnostic criteria, categories of disorders are not mutually exclusive (Teesson, Degenhardt, Proudfoot, Hall, & Lynskey, 2005). Teesson and colleagues (2005) report comorbidity is complicated and is a major research issue. Although the SCL-90-R separates psychological symptoms into nine different categories, the current study used the global severity index (GSI) to assess psychological symptoms. Previous research has indicated that the GSI is the best indicator of an individual's current level of distress (Ransom, Ashton, Windover, & Heinberg, 2010).

Rational for Current Study

The relationship between self-esteem and psychological symptomatology is unclear. High self-esteem produces positive outcomes (e.g., confidence and popularity), but at the same time, it can produce negative outcomes (e.g., narcissism); therefore promoting self-esteem may not always be beneficial. Instead, what may be particularly important is the level of flexibility an individual exhibits in conjunction with their level of self-esteem.

This study investigated the relationships between self-esteem, psychological and cognitive flexibility, and psychological symptomatology. Specifically, the following hypotheses were tested:

Hypothesis 1

Self-esteem was expected to show a curvilinear relationship with psychological symptoms - individuals with more extreme scores on both the higher and lower ranges of self-esteem would report higher psychological symptomatology, while individuals whose scores were neither high nor low would report lower symptom scores.

Hypothesis 2

Flexibility, psychological and cognitive, was expected to relate to the other form of flexibility and psychological symptomatology in the following ways:

- A. Psychological flexibility would be significantly correlated with cognitive flexibility - individuals that were more psychologically flexible were expected to be more cognitively flexible.
- B. Psychological flexibility would be significantly correlated with psychological symptoms - individuals with high flexibility would report low psychological symptomatology scores, while individuals with low flexibility would report higher symptoms.
- C. Cognitive flexibility would be significantly correlated with psychological symptoms - individuals with high flexibility would report lower psychological symptomatology, while individuals with low flexibility would report higher symptom scores.
- D. Psychological flexibility would be more strongly correlated with psychological symptoms than cognitive flexibility, such that psychological flexibility would be a better negative predictor of psychological symptoms than cognitive flexibility.

Hypothesis 3

Flexibility, psychological and cognitive, would moderate the relationship between self-esteem and psychological symptoms.

- A. Psychological flexibility would moderate the effect that self-esteem has on psychological symptoms. Thus, given equal levels of self-esteem, higher levels of psychological flexibility would decrease the severity of psychological symptoms.

B. Cognitive flexibility would moderate the effect of self-esteem on psychological symptoms. Thus, given equal levels of self-esteem, higher levels of cognitive flexibility would decrease the severity of psychological symptoms.

CHAPTER 2

METHOD

Participants

The sample recruited for this study consisted of undergraduate students taking psychology courses at the University of North Texas who could opt to participate in research as partial fulfillment of course requirements or for extra credit. To be included in the study, participants had to be at least 18 years of age. No other specific inclusionary or exclusionary criteria were made. Though a power analysis for multiple regression analyses (Tabachnick & Fidell, 2001) based on similar areas of research (Moradi & Subich, 2004; Moore, Brody, & Dierberger, 2009) revealed that a sample size of 41 would ensure an 80% likelihood of detecting an effect size of 0.3, more participants were recruited than necessary to account for potential attrition, missing data, and/or violations of the assumptions of statistical analyses. A total of 88 participants completed at least some portion of the study. Several participants' data needed to be removed from the database for a variety of reasons, which are further addressed in the Results section. Data from participants that completed the study in its entirety were used in statistical analyses ($N = 82$). Descriptive information was similar to the general university population. With regard to gender, there were 49 female participants, 31 male participants, and 2 transgendered participants, 59.76%, 37.80%, and 2.44% respectively. The average age for the sample was 20.56 years ($SD = 2.27$, range = 18 to 28). The following ethnic demographic characteristics were observed in the sample: 45.1% White/Caucasian ($n = 37$), 23.2% African American/Black ($n = 19$), 17.1% Hispanic/Latino ($n = 14$), 8.5% Asian/Pacific Islander ($n = 7$), 2.4% Biracial ($n = 2$), 2.4% Native American ($n = 2$), 1.2%, Other ($n = 1$), and 0.0% Middle Eastern/Arab ($n=0$).

Information on annual income and other demographic characteristics were obtained and are presented in Table 1.

Table 1

Sample Descriptive Statistics (N = 82)

	Frequency	Percent
Gender		
Male	31	37.8
Female	49	59.8
Transgender	2	2.4
Ethnicity		
White/Caucasian	37	45.1
Hispanic/Latino	14	17.1
Black/African American	19	23.2
Biracial	2	2.4
Asian/Pacific Islander	7	8.5
Other	1	1.2
Middle Eastern/Arab	0	0
Native American	2	2.4
Annual Income		
Less than \$20,000	66	80.5
\$20,000 – \$50,000	11	13.4
\$50,000 – \$100,000	4	4.9
More than \$100,000	1	1.2
Education Level		
Freshman	23	28.0
Sophomore	15	18.3
Junior	21	25.6
Senior	23	28.0

Measures

Demographics Questionnaire

Participants completed a brief demographics questionnaire (see Appendix) to determine: age, gender, education level, socioeconomic status, and ethnicity. These variables were chosen based on previous research in the areas of self-esteem, psychological and cognitive flexibility, and health symptoms reporting differences based on these variables.

The Rosenberg Self-Esteem Scale

The RSES (Rosenberg, 1989) is a 10-item self-report measure used to assess an individual's global self-esteem. The measure uses a 4-point Likert-type scale, ranging from 1 (*strongly disagree*) to 4 (*strongly agree*); however, in this study the likert scale was coded as such: 0 (*strongly agree*) to 3 (*strongly disagree*). The measure avoids response bias by counterbalancing positively and negatively worded items. Higher scores in this study indicate lower levels of self-esteem on the RSES. Example items include "I feel I do not have much to be proud of" and "I feel that I have a number of good qualities" (Rosenberg, 1989). The items of the RSES were appropriately reverse-scored and summed to create the total score of the RSES, which was utilized in the current study to measure the participants' self-esteem.

Rosenberg (1965) first developed the scale on a sample of 5,024 adolescents in New York. Further use of the scale has supported its unidimensionality (Silbert & Tippet 1965; Crandal, 1973; McCarthy & Hoge 1982; Corwyn, 2000), while other studies have indicated there may be two factors, one based on positively worded items and one based on negatively worded items (Carmines & Zeller 1974; Shahani, Dipboye, & Phillips 1990).

Numerous studies have reported satisfactory findings of reliability and validity for the RSES. Rosenberg (1979) reported an internal consistency reliability of 0.92. Silbert and Tippet

(1965) used the measure with college students and found a two-week test-retest reliability of .88. Furthermore, the RSES has demonstrated high internal consistency and validity (Fleming & Courtney, 1984; Hoge & McCarthy, 1984). Robins, Hendin, and Trzeniewski (2001) report that the RSES and the Single-Item Self-Esteem Scale have a convergent correlation that ranged from .89 to .94 in their sample of 508 undergraduate students. Additionally, the RSES has demonstrated convergent validity with the Health Self-Image questionnaire (Silbert and Tippet, 1965), Coopersmith Self- Esteem Inventory (Crandal, 1973), and the Global Self-Worth scale (Hagbor, 1994) in a sample of college students and in high school students. Fleming and Courtney (1984) have reported discriminant validity between the RSES and one's gender, age, work experience, marital status, birth order, and grade point average. Internal consistency reliability for the current study was $\alpha = 0.87$.

The Avoidance and Fusion Questionnaire for Youth

The AFQ-Y (Greco et al., 2005) is a self-report measure used to assess psychological inflexibility produced by cognitive fusion, experiential avoidance, and ineffective behaviors when negatively evaluated private events occur. The scale has 17 items that assess dimensions of inflexibility by measuring cognitive fusion (e.g., "The bad things I think about myself must be true."), avoidance (e.g., "I push away thoughts and feelings that I don't like") and inaction or behavioral ineffectiveness when unwanted internal experiences occur (e.g., "My life won't be good until I feel happy"). Items are rated on a Likert-type scale that ranges from 0 ("not at all true") to 4 ("very true") with higher scores indicating greater psychological inflexibility (total score range = 0 to 68). The items of the AFQ-Y were summed to create the total score of the AFQ-Y, which was utilized in the current study to measure the participants' psychological inflexibility.

The AFQ-Y demonstrated adequate internal consistency reliability ($\alpha=.90$) in a validation study by Greco, Lambert, and Baer (2008). Although it was developed for children, Schmalz and Murrell (2010) found that it was psychometrically appropriate to use with adult undergraduate students. They reported strong construct validity and adequate reliability ($\alpha = .92$) in a sample of adults. The AFQ-Y also showed appropriate convergent validity with measures of experiential avoidance (AAQ-II) and psychological symptoms (SCL-90-R), and divergent validity in regard to measures of mindfulness (Kentucky Inventory of Mindfulness Skills; KIMS) and quality of life measures (Schmalz & Murrell, 2010). Fergus et al. (2012) replicated Schmalz and Murrell's (2010) results with another college sample, and they also found that it was psychometrically appropriate to use a clinical sample of people with anxiety disorders in an intensive outpatient anxiety treatment program. In the current study, the internal consistency reliability was $\alpha = 0.87$.

Functional Fixedness

Functional fixedness was measured using the candle task, a creative convergent thinking task. Individuals received a written description of the candle task, accompanied by pictures of the items. The description asked participants how to mount a candle to a wall using only a box of tacks, matches, and a candle. For this task, participants were given a maximum of 20 minutes to write out their solution. Similar to Carnevale and Probst's (1998) study, participants' solutions to the problem solving task was scored a 1 if their solution involved removing the tacks from the box, using the tacks to pin the box to the wall, and mounting the candle to the box. Participants did not have to mention melting the bottom of the candle to make it stick onto the box. All other answers were scored 0. A score of 1 indicated less functional fixedness and more cognitive flexibility, while a score of 0 indicated more functional fixedness and less cognitive flexibility. Additionally, time of completion (in seconds) was recorded. A composite candle score was

computed. Individuals that scored 1 had their completion time added to the 1, while those that scored a 0 had their completion time subtracted from 0. Scores fell on a continuum based on obtaining the correct answer and the time in which the task was completed. Negative scores indicated the participant did not obtain the correct answer, and positive scores meant the participant did answer the task correctly. Additionally, the composite score revealed the length of time the individual engaged in the task. The absolute value of the composite candle score indicated more time taken to complete the task, and less time indicated completing the task in a shorter duration.

Symptom Checklist-90-R

The SCL-90-R (Derogatis, 1994) is a 90-item self-report measure designed to identify a range of psychological problems. Each item is rated on a Likert-type scale of distress ranging from 0 (*not at all*) to 4 (*extremely*). Each item is divided into nine categories of symptoms: somatization, obsessive-compulsive, interpersonal sensitivity, hostility, depression, anxiety, paranoid ideation, phobic anxiety and psychoticism. There are also three global indices measuring overall psychological distress: the Global Severity Index (GSI), the Positive Symptom Total (PST) and the Positive Symptom Distress Index (PDSI; Derogatis, Rickels, & Rock, 1976).

The reliability and validity of the GSI has been well established (Derogatis, 1994; Derogatis, Lipman, & Covi, 1973; Derogatis, Rickels, & Rock, 1976). The scores on the nine-symptom dimensions are expressed as a profile of symptoms, and scores greater than 1 suggest possible psychopathology. The GSI is calculated as the average score of the 90 items on the questionnaire. Martinez, Stilerman, and Waldo (2005) reported the measure has good internal consistency for the individual subscales; however the GSI was not investigated. They reported Cronbach's alpha that ranged from .65 to .81 for each of the subscales of the SCL-90-R, in a

sample of 205 college students. The SCL-90-R has an adequate test-retest reliability that ranged from .78 to .90 after one week for a sample of 94 mixed psychiatric outpatients; again, the test-retest reliability for the GSI was not reported (Derogatis, 1983). The SCL-90-R also showed appropriate convergent validity with measures of personality like the Minnesota Multiphasic Personality Inventory (MMPI; Derogatis et al., 1976) and the Middlesex Hospital Questionnaire (Boleloucky & Horvath, 1974), and adequate discriminant validity with the SCL-90-R being able to distinguish between individuals with dysthymia, anxiety disorders, and anorexia nervosa (Rief & Fichter, 1992). Overall, the literature supports the reliability of the SCL-90-R, but the validity is more controversial, especially the discriminant validity (Holi, 2003). The psychometric properties mentioned previously apply to the nine categories of symptoms rather than the GSI, which was utilized in this study. Moreover, the psychometric properties for the GSI have not been previously reported. For the current study, internal consistency reliability was $\alpha = 0.98$. The items were appropriately scored to create the GSI of the SCL-90-R, which was utilized in the current study to measure the participants' psychological symptomology.

Creative self-efficacy

The creative self-efficacy questionnaire (Tierney & Farmer, 2002) is a three-question measure used to assess an individual's creative self-efficacy. The three items are (a) "I am good at coming up with new ideas," (b) "I have a lot of good ideas," and (c) "I have a good imagination." Each item is rated on a Likert-type scale ranging from 1-*strongly disagree* to 5-*strongly agree*. Higher scores indicate higher levels of self-efficacy on producing creative outcomes, while lower scores indicate lower levels of creative self-efficacy. The items of the creative self-efficacy measure were appropriately summed to create the total creative self-efficacy score, which was utilized in the current study to measure the participants' creative self-

efficacy. For the current study, the measure was used to explore the relationship between creative self-efficacy and completing the functional fixedness – cognitive flexibility – task. Previous research reports good internal consistency, with a Cronbach’s alpha of .86 between the three items in middle school and secondary school students (N = 1,322; Beghetto, 2006), and test-retest reliability with Cronbach’s alpha at .74 to .81 in adults (Tierney & Farmer, 2011). The internal consistency reliability for the current study was 0.85.

Procedure

All participants were assigned a unique identification number at the beginning of the study, and all questionnaires were coded with this number. Upon arrival, each participant was first asked to read and sign a copy of the Informed Consent Form (see Appendix A). The procedure was done in the same way to ensure standardization. Additionally, participants completed the self-esteem measure first in order to minimize socially desirable responding, and to decrease the likelihood that one’s flexibility or psychological symptoms would influence their subsequent self-reported level of esteem. Therefore, all participants completed the survey in the following order: the demographics questionnaire (see Appendix B), self-esteem measure, psychological flexibility measure, psychological symptoms measure, cognitive flexibility task, and finally, the creative self-efficacy measure. A master list linking participant identification numbers with participant names was destroyed after all data had been collected and all participants had received proper credit for their participation.

CHAPTER 3

RESULTS

Preliminary Data Analyses

General screening guidelines set forth by Tabachnick and Fidell (2001) were utilized. The distribution and pattern of missing data was first evaluated. Eighty-eight individuals participated in the study; however, two individuals did not complete measures pertinent to hypothesis testing (Rosenberg Self-Esteem Scale [RSES] or Symptom Checklist-90-Revised [SCL-90-R]) and were removed from the sample. Nine other participants had one missing data point on different questions of the AFQ-Y. These individuals were dummy coded for missing data versus no missing data and an independent sample *t*-test comparing the two groups suggested the individuals were missing data at random rather than due to a pattern. Their mean AFQ-Y item score was imputed in place of the missing data point.

Standardized scores and frequency histograms were examined for univariate outliers on variables relevant to hypothesis testing: the total scores for the AFQ-Y, RSES, creative self-efficacy, the SCL-90-R GSI, Composite Candle score, and age. The suggested *Z*-score of +/- 3.29 was used as the value of significance (Tabachnick & Fidell, 2011). Three cases were found to be outliers due to the age of the participant, and one was found to be extreme on the composite candle score (time to complete the functional fixedness task). These cases were highly extreme and not characteristic of the collected sample. These four cases were removed from further data analysis. After the removal of these data points, there were no further univariate or multivariate outliers, as measured by the Mahalanobis distance values.

Skewness and kurtosis data were then examined according to procedures outlined by Tabachnik and Fidell (2001) for the same variables listed above. Using the calculation for

excessive skewness and kurtosis (skewness/standard error of skewness and kurtosis/standard error of kurtosis), an absolute value of 3.3 or greater was used to determine significant deviations from normality. Results indicated that creative self-efficacy total scores deviated significantly from normality and exhibited moderate negative skewness. Therefore, the creative self-efficacy total scores were squared, and the variable subsequently met the assumption of normality.

Hypothesis Testing

Prior to hypothesis testing, the assumptions for multiple regression were assessed through graphic exploration and/or through statistical analysis. In order to conduct the regression analyses, preliminary analyses were conducted to ensure that there were no violations of the assumptions of linearity, homoscedasticity, and homogeneity of error variance. A series of correlations were conducted to test the assumption of multicollinearity (see Table 2). No variables utilized in hypothesis testing were found to have correlations large than .7, which suggests no multicollinearity among the variables in the current study (Tabachnick & Fidell, 2001). Additionally, the correlation coefficients, tolerance, and variance inflation factor (VIF) were examined. The tolerance coefficient was found to be greater than .20 and VIF was found to be below 4, indicating that the assumption of multicollinearity was not violated (Howell, 2010).

Finally, the assumptions of linearity, homoscedasticity, and homogeneity of error variance were further examined for each regression equation with a series of scatterplots. Normal probability plots and standardized residual scatterplots were visually examined to determine if assumptions of linearity, homoscedasticity, and homogeneity of error variance were met. Visual inspection of these plots suggested significant heteroscedasticity, which was related to the nonlinear distribution of the total RSES scores. Therefore, the total RSES variable was squared in order to reduce deviations from normality, as suggested by Tabachnik and Fidell (2001).

Heteroscedasticity was reduced after the transformation; however, visual inspection of scatterplots indicated that the relationships between the independent and dependent variables were less than ideal. Given that minor deviations from linearity tend to weaken, rather than invalidate, the likelihood of statistical significance in regression analyses, it was deemed appropriate to proceed with the analyses.

Table 2

Testing Multicollinearity Among Variables of Interest

Measure	1	2	3	4	5
1 Creative Self-Efficacy	--				
2 Composite Candle Score	.058	--			
3 Total RSES	.275*	-.043	--		
4 AFQ-Y	.024	.102	-.597***	--	
5 SCL-90-R GSI	-.040	.237*	-.592***	.583***	--

Note. * $p < .05$, *** $p < .001$

Table 3

Descriptive Statistics for Variables of Interest

Scale	N	Min. (observed)	Max (observed)	Mean	SD
Total AFQ-Y	82	0	48	17.49	10.17
Total RSES	82	10	30	22.69	4.90
SCL-90-R GSI	82	29	80	59.57	11.48
Functional Fixedness – Candle Task Time of Completion (seconds)	82	39	455	189.18	89.14
Creative Self-Efficacy	82	3	15	11.46	2.69
Age	82	18	28	20.56	2.27

Note. AFQ-Y = Avoidance and Fusion Questionnaire - Youth. RSES = Rosenberg Self-Esteem Scale.

Hypothesis 1

The hypothesis that self-esteem would show a curvilinear relationship with psychological symptoms was analyzed through a nonlinear regression. A hierarchical regression was used to test the significance of the nonlinear regression. The predictor variable was the total score of the RSES, and the dependent variable was the SCL-90-R GSI. The first block contained the total RSES score. The second block contained the squared total RSES score. The total RSES score entered into step 1 explained 34.5% of the total variance in psychological symptoms, $R^2 = 0.35$, $\text{Adj. } R^2 = 0.35$, $\beta = -1.39$, $p < 0.001$. The squared RSES score entered in step 2 did not explain any further variance in psychological symptoms, $\Delta R^2 = .00$, $\Delta F = 0.05$, $p = 0.83$. The data did not support hypothesis 1. See Table 4.

Table 4

Summary Nonlinear Regression Analysis for the Relationship Between of Self-Esteem on Psychological Symptoms

Variable	Model 1			Model 2		
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
Self-Esteem	-1.393	.211	-.594***	-1.052	1.580	-.449
Self-Esteem Squared				-.008	.036	-.147
R^2		.353			.354	
<i>Adj. R</i> ²		.345			.337	
R^2 Change		.353			0.00	
<i>F</i> for change in R^2		43.73***			0.0487	

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

Hypothesis 2a

Hypothesis 2A stated that psychological flexibility would be significantly correlated with cognitive flexibility, such that individuals who are more psychologically flexible are also more cognitively flexible. A Pearson's product moment correlation was conducted between the Total Score of the AFQ-Y and the composite candle score, $r = 0.10$, $p = 0.18$. The hypothesis that psychological flexibility and cognitive flexibility would be positively correlated was not supported. See Table 5.

Hypothesis 2b

The hypothesis that psychological flexibility would be significantly correlated with psychological symptoms was analyzed using a Pearson's product moment correlation. The total score of the AFQ-Y and the SCL-90-R GSI were correlated, $r = 0.58, p < 0.001$. As such, the hypothesis that psychological flexibility and psychological symptoms would be significantly related was supported. See Table 5.

Hypothesis 2c

The hypothesis that cognitive flexibility will be significantly correlated with psychological symptoms was analyzed using a Pearson's product moment correlation. The composite candle score and the SCL-90-R GSI were correlated, $r = 0.24, p < 0.05$. As such, the hypothesis that cognitive flexibility and psychological symptoms would be significantly related was supported. See Table 5.

Table 5

Summary of Correlations Among Variables of Interest Used in Analyses

Scale	1	2	3
Total AFQ-Y			
Composite Candle	.102		
SCL – 90 – R GSI	.58***	-.24*	

Note. AFQ–Y = Avoidance and Fusion Questionnaire - Youth. SCL – 90 – R GSI = Symptom Checklist – Revised Global Severity Index. *** $p < .001$. * $p < .05$

Hypothesis 2d

A Fisher's Z transformation was computed to compare the correlations between psychological flexibility and psychological symptoms, and cognitive flexibility and

psychological symptoms, to assess which was a better predictor of psychological symptoms. The Fisher r-to-z transformation indicated that psychological flexibility was a better predictor of psychological symptoms than cognitive flexibility, $Z = 2.67, p < 0.01$. The hypothesis that psychological flexibility would be more strongly correlated to psychological symptoms than cognitive flexibility was supported.

Hypothesis 3

Two separate hierarchical regression analyses were conducted to test hypotheses 3A and 3B - that psychological flexibility (3A) and cognitive flexibility (3B) would moderate the relationship between self-esteem and psychological symptoms.

The moderation analysis was conducted as outlined in Frazier, Tix, and Barron (2004). In the first step of the analysis, the predictor variables (the squared total score of the RSES, the AFQ-Y, composite candle score) were standardized by subtracting the sample means of the variable from each respective variable and dividing by the standard deviation to produce revised sample means of zero. After standardizing each variable, two product terms were created, one for each hierarchical regression analysis, in order to represent the interaction between the independent variable (squared total RSES score) and the moderator variables (total AFQ-Y score, composite candle score). The first product term was created by multiplying the standardized squared RSES score variable with the standardized AFQ-Y score variable (3A), and then the second was created by multiplying the standardized squared RSES score variable with the standardized composite candle score (3B; Frazier, Tix, & Barron, 2004).

The final step of the moderation analysis was to conduct two hierarchical multiple regressions. For hypothesis 3A, the predictor variables (squared total RSES and total AFQ-Y) were entered into the regression equation through a series of specified blocks. The first

step/block of the regression contained the standardized squared total self-esteem score (RSES). The second step contained the standardized psychological flexibility total score (AFQ-Y). The third step contained the product term (squared total RSES score and total AFQ-Y score). The SCL-90-R GSI served as the dependent variable. The self-esteem score explained 34.2% of the variance in the psychological symptoms score ($R^2 = 0.35$, $\text{Adj } R^2 = 0.34$, $\beta = -0.59$, $p < 0.001$). After the entry of psychological flexibility score, the total variance explained by the model was 41.8% ($\text{Adj. } R^2 = 0.42$, $\Delta R^2 = 0.08$, $\beta = 0.36$, $\Delta F = 11.48$, $p < 0.001$). Psychological flexibility accounted for an additional 8.2% of the variance in psychological symptoms, above and beyond that of self-esteem.

The product term was entered in the final step of the analysis. After the entry of the product term, the total variance explained by the model as a whole was 42.7% ($\text{Adj. } R^2 = 0.43$, $\Delta R^2 = 0.015$, $\beta = -0.13$, $\Delta F = 2.14$, $p = 0.15$). While the model as a whole was significant, there was not a significant proportion of the variance explained by the interaction of self-esteem and psychological flexibility total scores. Psychological flexibility, therefore, did not moderate the interaction between self-esteem and psychological symptoms, as the product term did not significantly contribute to the variance. As such, hypothesis 3A was not supported.

The second hierarchical multiple regression tested whether or not cognitive flexibility moderated the relationship between self-esteem and psychological symptoms. For hypothesis 3B, the predictor variables (squared total RSES and the composite candle score) were entered into the regression equation through a series of specified blocks. The first step/block of the regression contained the standardized squared total self-esteem score (RSES). The second step contained the standardized cognitive flexibility score (composite candle score). The third step contained the product term (squared total RSES score and composite candle score). The SCL-90-R GSI served

as the dependent variable. The self-esteem score explained 34.2% of the variance in the psychological symptoms score ($R^2 = 0.35$, $\text{Adj } R^2 = 0.34$, $\beta = -0.59$, $p < 0.001$). After the entry of cognitive flexibility score, the total variance explained by the model was 38% ($\text{Adj. } R^2 = 0.38$, $\Delta R^2 = 0.05$, $\beta = 0.21$, $\Delta F = 5.86$, $p < 0.05$). Cognitive flexibility accounted for an additional 3.8% of the variance in psychological symptoms, above and beyond that of self-esteem.

In the final step of the analysis, the product term was entered. After the entry of the product term, the total variance explained by the model as a whole was still 38% ($\text{Adj. } R^2 = 0.38$, $\Delta R^2 = 0.005$, $\beta = -0.07$, $\Delta F = 0.65$, $p = 0.42$). While the model as a whole was significant, there was not a significant proportion of the variance explained by the interaction of self-esteem and cognitive flexibility. Cognitive flexibility did not moderate the interaction between self-esteem and psychological symptoms, as the product term did not significantly contribute to the variance. Hypothesis 3B was not supported (see Tables 6 and 7).

Table 6

Summary Regression Moderation Analysis for Psychological Flexibility as a Moderator for the Impact of Self-Esteem on Psychological Symptoms

Variable	Model 1			Model 2			Model 3		
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
Self-Esteem	-.592	.090	-.592***	-.378	.106	-.378***	-.370	.105	-.370***
Psychological Flexibility				.358	.106	.358***	.352	.105	.352***
Self-Esteem X Psychological Flexibility							-.129	.088	-.124
R^2		.350			.433			.448	
<i>Adj. R</i> ²		.342			.418			.427	
R^2 Change		.350			.082			.015	
<i>F</i> for change in R^2		43.12***			11.48***			2.14	

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

Table 7

Summary Regression Moderation Analysis for Cognitive Flexibility as a Moderator for the Impact of Self-Esteem on Psychological Symptoms

Variable	Model 1			Model 2			Model 3		
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
Self-Esteem	-.592	.090	-.592***	-.583	.088	-.583***	-.581	.088	-.581***
Cognitive Flexibility				.212	.088	.212*	.218	.088	.218*
Self-Esteem X Cognitive Flexibility							-.075	.093	-.071
R^2		.350			.395			.400	
<i>Adj. R</i> ²		.342			.380			.377	
R^2 Change		.350			.045			.005	
<i>F</i> for change in R^2		43.12***			5.86*			.651	

Note. *** $p < .001$. * $p < .05$

Exploratory Analyses

In addition to the main hypotheses, several exploratory analyses were conducted to examine the relationship between self-esteem, psychological flexibility, cognitive flexibility, self-efficacy, and psychological symptoms.

The relationships between self-esteem and creative self-efficacy, and cognitive flexibility and creative self-efficacy were examined without a priori hypotheses. A Pearson's product moment correlation was conducted between the squared total score of the RSES and the total score for creative self-efficacy. There was a significant positive correlation between self-esteem

and creative self-efficacy ($r = 0.28, p = 0.01$). Furthermore, a Pearson's product moment correlation was conducted between the composite candle score and the total score of the creative self-efficacy; in this sample, no statistically significant relationship between cognitive flexibility and creative self-efficacy was found ($r = 0.06, p = 0.60$).

No a priori hypotheses were made regarding the relationship between experiential avoidance and self-esteem. A Pearson's product moment correlation was conducted between the total score of the AFQ-Y and the total score of the RSES ($r = -0.60, p < 0.001$). This suggests a negative relationship between psychological flexibility and self-esteem, such that people with low self-esteem reported being more psychologically flexible than the individuals with higher self-esteem.

Lastly, an independent samples *t*-test was utilized to assess differences in cognitive flexibility based on education level. Participants were divided based on education level. This sample contained only freshman, sophomore, junior, and senior undergraduate university students. Two groups were formed: freshman and sophomores, and juniors and seniors. Sample sizes were 38 and 44, respectively. Independent samples *t*-tests indicated there was a significant difference in cognitive flexibility scores between freshman and sophomores, and juniors and seniors, $t(80) = 2.19, p = 0.03$. Specifically, in this sample, the freshman and sophomores had higher cognitive flexibility scores than the junior and senior university students. See Table 8.

Table 8

Analysis of Variance for Education Level and Cognitive Flexibility

<i>Education Level</i>	<i>N</i>	<i>M</i>	<i>SD</i>	<i>Comparison t(df)</i>
Freshman + Sophomore	38	32.03	187.43	2.19 (80)*
Junior + Senior	44	-67.23	218.58	

Note. * $p < .05$

CHAPTER 4

DISCUSSION

The purpose of the current study was to explore the relationships among self-esteem, psychological flexibility, cognitive flexibility, and psychological symptoms. Since previous research had revealed inconsistent findings related to self-esteem and health outcomes (e.g., Heilburn, 1981; Greenberg et al., 1993; Seligman, 1995), the proposed model predicted that an individual's level of flexibility (psychological and cognitive) would moderate the relationship between self-esteem and psychological symptoms. However, results failed to support a moderating relationship in this sample. The results of hypothesis testing, general implications, limitations, and future directions for research are explored below.

It was hypothesized that self-esteem would demonstrate a curvilinear relationship with psychological symptoms, such that individuals with self-esteem scores at high and low extremes would report more psychological symptoms. Results indicated that a linear model was a better fit ($\Delta R^2 = 0.35, p < 0.001$), as there was no evidence of a curvilinear relationship ($\Delta R^2 = ns$) between self-esteem and psychological symptoms. The next set of hypotheses assessed the relationship between flexibility (psychological and cognitive) and psychological symptoms. First, it was hypothesized that psychological and cognitive flexibility would be positively correlated. They were not, statistically speaking ($r = 0.10, p = 0.18$). It was further hypothesized that psychological flexibility would be negatively correlated with psychological symptoms, and cognitive flexibility would be negatively correlated with psychological symptoms. Both of these hypotheses were supported ($r = .58, p < 0.001; r = .24, p < 0.05$). Subsequently, it was hypothesized that psychological flexibility would be a better negative predictor of psychological symptoms than cognitive flexibility. This was also supported ($z = 2.67, p < 0.01$). Lastly, it was

hypothesized that psychological flexibility and cognitive flexibility (separately) would moderate the relationship between self-esteem and psychological symptoms. Neither psychological flexibility ($\Delta R^2 = 0.08, p = 0.15$) nor cognitive flexibility ($\Delta R^2 = 0.005, p = 0.42$), however, moderated the relationship between self-esteem and psychological symptoms.

Self-esteem and Psychological Symptoms

In the current sample, self-esteem was not curvilinearly related to psychological symptoms. There was, however, a moderate negative correlation between self-esteem and psychological symptoms. In this sample of participants, those who had higher levels of self-esteem tended to have higher reports of psychological symptoms, consistent with the area in the self-esteem literature that indicates high self-esteem is related to negative outcomes. In addition, exploratory analyses revealed that individuals reporting higher self-esteem also indicated lower levels of psychological flexibility than those with lower levels of self-esteem. This finding is consistent with the notion that high self-esteem may be related to narcissism, self-absorption, and lack of concern for others (Seligman, 1995). Many different factors could have impacted this relationship. One such factor could be that the individuals with high self-esteem were more aware and attuned to the symptoms they are endorsing.

However, this finding is not consistent with research that reports that high self-esteem is related to good adjustment and more self-confidence while low self-esteem is related to negative outcomes and self views (Heilburn, 1981; Taylor, 1989; Whitley, 1983; McFarlin & Blascovich, 1981; Blaine & Crocker, 1993). The individuals with low self-esteem actually reported lower levels of psychological symptomology. These individuals could, indeed, not be experiencing symptoms or not be attuned to recognizing them when they are present. In this sample, the existence and endorsement of low self-esteem did not dictate the endorsement of symptomology.

It is important to note an individual's level of social desirability was not accounted for to aid in the interpretation of this finding. There is a possibility that individuals did not want to disclose negative self-views and chose to present themselves in a more favorable way. This could have been accounted for had there been a social desirability scale. Perhaps future research could expand and shed some light on the current finding.

Flexibility and Psychological Symptoms

Psychological Flexibility and Cognitive Flexibility

To date, there have been no published studies exploring the relationship between psychological flexibility and cognitive flexibility. Because the constructs are similar, it was expected that they would be positively correlated, and that they were two aspects of a general type of flexibility. However, in this sample of individuals, there was no statistically significant relationship between psychological flexibility and cognitive flexibility.

There are several potential explanations for the lack of significance. First, the nature of the relationship may not be as hypothesized. Perhaps psychological flexibility and cognitive flexibility are conceptually different and affect individuals differently. As the demands of a task change, one's ability to adjust his or her problem solving plan is associated with higher cognitive flexibility. Psychological flexibility refers to an individual's ability to be fully connected with the present moment and engage in behaviors that are consistent with one's identified values (Hayes et al., 2012). Additionally, psychological flexibility involves emotionality, while cognitive flexibility is specific to problem solving. While both constructs require that an individual be connected to the present moment in order to adapt and behave appropriately in the present situation, it may be more or less difficult to be aware of different options, which may lead to different levels of flexibility. Individual differences may impact the ease or difficulty of being

flexible. For example, perhaps an individual's creativity, interest/investment in the task, level of stress, and time constraints could influence awareness of different problem solving or behavioral options in the moment. Additionally, being more aware and attuned to different problem solving actions may be inherently different than being aware of and acting on different value consistent behaviors.

Another explanation for the lack of significant relationship might be the way these constructs were measured in the current study. Psychological flexibility was measured using a self-report measure, while cognitive flexibility was measured using a convergent creative problem solving task. The method by which they were assessed may have impacted the way the measures were compared to each other. Future research may wish to use more appropriately comparable measures, for example, two self-report measures, or two interactive tasks that require psychological flexibility and cognitive flexibility.

Furthermore, another possibility for the present finding relates to the limited sample in which this study was based. All of the participants in the study were intelligent and achieving college students who were admitted into a public four-year-university, rather than a more varied sample of individuals from the community. Also, in the sample, participants appeared to be functioning well enough to participate in a research study regardless of the level of distress they reported, which for most participants was not extreme. Additionally, the range of cognitive flexibility was limited; there were no extremes in cognitive flexibility based on individuals' understanding of the task. This limitation in variability may have impacted the present findings.

Psychological Flexibility and Psychological Symptoms

Psychological flexibility was significantly correlated with reported psychological symptoms. More psychologically flexible individuals in this sample reported fewer symptoms

than those that were less flexible. This is consistent with the research findings that psychologically flexible individuals also tend to be more open and accepting of emotional experiences (Kashdan & Rottenberg, 2010) and emotional expression (Bonanno, Papa, Lalande, Westphal, & Coifman, 2004), rather than avoiding emotional experiences and potentially exacerbating issues that interfere with values consistent behavior (Kashdan, Barrios, Forsyth, & Steger, 2006; Wilson & Murrell, 2004). Conversely, an absence of flexibility is related to various forms of psychopathology (Kashdan & Rottenberg, 2010), such as social anxiety (Dalrymple & Herbert, 2007), depression (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008), GAD (McLaughlin, Mennin, & Farach, 2007), ADHD (Barkley, 1997), and substance abuse (Iacono, Carlson, Taylor, Elkins, & McGue, 1999).

Cognitive Flexibility and Psychological Symptoms

Cognitive flexibility was significantly correlated with reported psychological symptoms. More cognitively flexible individuals in this sample reported fewer psychological symptoms than those that were less cognitively flexible. This finding is expected given that much of the literature in this area indicates cognitively flexible individuals are able to generate more possibilities in certain situations that might be upsetting (O'Keefe & Delia, 1982). Those individuals who are more rigid in their thinking are more likely to evidence symptoms of psychopathology (Dennis & Vander Wal, 2010).

Psychological Flexibility versus Cognitive Flexibility

In the prediction of psychological symptoms, psychological flexibility was found to be a stronger negative predictor of symptoms than was cognitive flexibility, which is a novel finding. There are several possible explanations for this result.

When individuals encounter situations that make psychological distress likely to arise, there are multiple options for coping, including problem-focused coping and emotion-focused coping (Folkman & Lazarus, 1980). Folkman and Lazarus state that problem-focused coping is more likely to be effective when the stressful situation is believed to be solvable, while emotion-focused coping is more likely to be effective when the stressful situation is more long-term and less can be done to fix the problem. Perhaps as individuals are experiencing psychological distress, they are evaluating which type of coping would be more beneficial in their given situation. They are, in essence, weighing options for flexible responding. Moreover, individuals may be flexible or inflexible. In fact, they may not even be aware of different actions or outcomes to engage in for the given situation. Furthermore, there may be some distressing circumstances that elicit less flexibility than others. For example, if an individual was given an ultimatum with no room for compromise, that may bring forth fewer ways of handling the situation. After appraising a distressing situation, an individual may choose a type of coping strategy (or flexibility type) based on the situation.

The cognitive flexibility task used in this study was very problem-focused in nature; however, the psychological distress measure utilized may tap more into distress that is more relevant to emotion-focused coping, which would be perhaps better addressed by psychological flexibility. Indeed, there may be instances where being more problem-focused is more adaptable for a distressing situation. As examples, consider the woman who needs to change her driving route to get to work on time because of a traffic jam or the new father who changes his sleep schedule to adjust to the birth of a child. These changes are crucial to flexible responding and are not solely, but highly, cognitive in nature. Those situations would probably be better assessed with a different outcome measure.

Another explanation for the current finding could be related to the generalizability of psychological flexibility. Since it pertains to value consistent behavior, it can span many different areas of life an individual finds valuable, like family, parenting, social relationships, spirituality, education, and employment to name a few. While cognitive flexibility may be less generalizable, the current study did not find a significant relationship between these types of flexibility. As such, the constructs may measure distinct constructs, which may relate to outcomes in different ways.

As stated before, it is important to note that the methods used to assess these constructs differed. Psychological flexibility and psychological symptoms were assessed through self-report measures, while the creative cognitive flexibility task was a convergent creative problem solving task. Future research should replicate this finding using comparable measures to account for the difference in assessing the constructs.

Self-esteem, Flexibility, and Psychological Symptoms

In the current study, it was hypothesized that psychological and cognitive flexibility would moderate the relationship between self-esteem and psychological symptoms. This hypothesis was not supported. Given equal levels of self-esteem, individuals with higher levels of psychological and cognitive flexibility did not demonstrate significantly fewer psychological symptoms, as was expected. Instead, self-esteem, psychological flexibility, and cognitive flexibility were found to be significant negative predictors of psychological symptomology. By using the combination of constructs, we can aid in psychological treatment to help promote flexibility. One way to encourage increased flexibility is through ACT, as it aims to increase mindful awareness in the present moment to help individuals be more conscious of different behavioral choices they have in their current situations.

There are several possible reasons that may account for the lack of moderation. One reason could be that the relationship between flexibility and psychological symptoms is more complex than was measured by the current study. Perhaps the current measures of flexibility, psychological and cognitive, were too broad and more specific forms of flexibility would explain the self-reported presentation of psychological symptoms.

Another difficulty pertains to the study's design as it relates to testing for moderation, including an inaccurate representation of the strength of the hypothesized effect (i.e., power) and the issues related to statistical power for testing interaction effects (Whisman & McClelland, 2005). Another issue relates to the reliability and error that inadvertently occurs when measuring the variables of choice. This happens when the individual constructs are measured with some error, their interaction term is deemed to have more error as well (Frazier, Tix, & Barron, 2004; Whisman & McClelland, 2005). There may have been some error in the cognitive flexibility measure. Although it was a theoretically sound choice for measuring cognitive flexibility, the cognitive flexibility task used has a lack of research regarding reliability and validity.

Exploratory analyses

Self-esteem and Creative Self-efficacy

The published trend in the literature generally shows that high self-esteem is correlated with high self-efficacy (Brockner, 1979; Gist, & Mitchell, 1992; Kavanagh & Bower, 1985; Sherer et al., 1982). This trend also applies to creative self-efficacy and self-esteem, as reported in the presentation by Karwowski (2010) who found that individuals with higher levels of self-esteem had higher levels of self-efficacy. In the current study, this trend was not supported. The individuals that endorsed lower self-esteem actually reported higher creative self-efficacy than those that endorsed higher self-esteem. One potential explanation for this finding may be that

individuals in this sample with a low self-evaluation rated their creativity as higher as a way to overcompensate for feeling low about themselves. Perhaps the individuals with lower self-esteem are not generalizing their low self-evaluation to all aspects of their functioning. The opposite may be true for those with high self-esteem- they feel good about themselves, such that they do not feel like they need to overcompensate in other areas of their functioning.

Alternatively, they may be more willing to accept their lack of creativity as measured, and it not impact how they feel about themselves. Additionally, there was no measure of social desirability to assess if individuals were engaging in impression management on any of the measures.

An alternative reason for this finding may be related to the order in which the measures were administered. Self-esteem was assessed first and the creative self-efficacy was assessed after completing the cognitive flexibility task. An individual's perceived performance may have impacted the way in which they felt about their performance. So someone who felt good about him/herself may have changed personal beliefs about creative self-efficacy after completing the cognitive flexibility task. Additionally, the creative self-efficacy measure was different than the one utilized in Karwowski's (2010) reported study. Perhaps the two questionnaires measured two different aspects of the same construct. A further investigation on the similarities and differences of the two measures is warranted to help further understand this finding. Lastly, the self-efficacy measure used in this study measured a very broad definition of creativity as the three questions referred to beliefs about coming up with ideas and having an imagination. This may have elicited higher self-appraisals on the questions by many individuals.

Cognitive Flexibility and Creative Self-efficacy

In theory, self-efficacy and cognitive flexibility are related and interconnected (Martin & Anderson, 1998). Few studies have investigated this relationship, but Martin and Anderson

(1998) report that cognitive flexibility was related to more self-efficacy when communicating in different circumstances. Because the cognitive flexibility task in this study was a creative task, creative self-efficacy was assessed rather than a more general self-efficacy measure. To date, there have been no studies investigating the role of cognitive flexibility and creative self-efficacy. When tested, the current study did not find a significant relationship between cognitive flexibility and creative self-efficacy. The lack of significance may be due to the difference in the classification of the task. Perhaps the cognitive flexibility candle task was not a creative task, making the creative self-efficacy measure inapplicable and not the best measure of efficacy for the task.

Psychological Flexibility and Self-esteem

Although there have been no formal studies examining the relationship between self-esteem and psychological flexibility, there has been research published on constructs similar to self-esteem as it relates to psychological flexibility. For example, psychological flexibility has been invoked through the use of defusion techniques to shift the way in which individuals relate to their self-referenced thoughts, judgments, and emotions (Hinton & Gaynor, 2010). By fostering psychological flexibility, one becomes less attached to “positive” and “negative” self-evaluations. The current study found that those with lower rated self-esteem reported higher levels of psychological flexibility than those with higher levels of self-esteem. Perhaps being psychologically flexible allows an individual to have a balanced and realistic view that allows them to be detached from needing to present themselves in an overly positive way. An individual may acknowledge their flaws, yet not be attached to their evaluation for it to get in their way.

Education Level and Cognitive Flexibility

Wecker, Kramer, Hallam, and Delis (2005), found that in their sample of 719 (age range: 20 to 89) the older the individuals were, the poorer their performance was on tasks measuring cognitive switching tasks (e.g., of the D-KEFS Trail Making Test, verbal and design fluency) even after controlling for confounding factors like visual scanning, motor speed, fluency, and demographic factors like education, gender, and IQ. In the current study, there were minor differences to make note of regarding education level and cognitive flexibility. The juniors and seniors exhibited less cognitive flexibility than freshman and sophomores. This implies that the freshman and sophomore students in the sample answered the candle task correctly and in less time than the juniors and seniors. However, this finding could also be due to participants' level of investment in their education or in the task itself, feeling tired, their enjoyment of cognitive activity, or various other external factors that could have impacted their level of effort on the cognitive flexibility task.

General Implications

The current findings add to the understanding of factors involved in self-reported symptomology. Further research is needed to clarify the underlying mechanisms of self-esteem and the reasons for the inconsistencies in research findings. One way to do this is for researchers to investigate the multi-dimensional model of self-esteem to gain a better understanding of the inconsistencies found in health outcome research. Further, there is research on different facets of self-esteem such as defensive self-esteem (O'Brien & Epstein, 1988), the stability of self-esteem (Kernis, Cornell, Sun, Berry, & Harlow, 1993), optimal self-esteem (Kernis, 2003), and fragile self-esteem (Kernis, Paradise, Whitaker, Wheatman, & Goldman, 2000), to name a few. Perhaps these factors intertwine and overlap in ways to help understand individuals and the connection between distress and self-image.

Interestingly, more research is needed to compare the similarities and differences among cognitive and psychological flexibility. It was evident from this study that both impacted reported psychological symptoms, and perhaps their impact was different since they did not explain the same amount of variance in psychological symptoms. It would be interesting to better understand the uniqueness that each type of flexibility accounts for in understanding health symptoms. In theory, psychological and cognitive flexibility have some similarities. A flexible individual is thought to connect to the present moment in order to adapt and behave appropriately in the situation at hand. Both forms of flexibility are contextually based and dependent on one's environment. However, there are some differences in flexibility that may have been accounted for in this study due to the lack of significant correlation between the two constructs. Again, as stated previously, this could be due to the method by which the constructs were measured - a self-report measure versus a creative convergent thinking task.

Additionally, a general developmental model of cognitive flexibility may warrant further exploration. In the current study, juniors and seniors exhibited a little less cognitive flexibility than freshman and sophomores. Much of the research on the development of cognitive flexibility explores age differences related to childhood to young adulthood (Huizinga, & van der Molen, 2007; Crone, Bunge, van der Molen, & Ridderinkhof, 2006; Crone, Ridderinkhof, Worm, Somsen, & Molen, 2004). These researchers suggest age-related improvement on tasks measuring cognitive flexibility, like the WCST, in children aged 8 to 9-year-olds, 11 to 12-year-olds, 13 to 15-year-olds and 18 to 25-year-olds (Crone, 2004). Perhaps exploring the differences in a wider age range of adults may reveal a declining pattern in cognitive flexibility.

The applied implications of the current study pertain to the advancement of flexibility and the emphasis in the research, academic, and therapeutic realms on enhancing self-esteem

(Crocker & Park, 2004). With as much emphasis being paid to self-esteem and its importance as individuals develop, it is surprising that there is still so much controversy in the definition, measurement, and implications (Baumeister, Campbell, Krueger, & Vohs, 2003). This study showed that the higher one reported self-esteem, the more psychological symptoms endorsed, and the more cognitively inflexible an individual was, the more symptoms endorsed. Perhaps it would be beneficial to teach individuals to be more open to their experiences and receptive to the different circumstances life may bring their way, rather than to emphasize the need to evaluate oneself favorably.

One way to do this is through ACT. ACT promotes psychological flexibility through the hexaflex: acceptance, cognitive defusion, contact with the present moment, self-as-context, valuing, and committed action (Hayes, et al., 2012). There have been 62 randomized control trials as of June 20, 2012 investigating the effectiveness of ACT and various outcomes, like depression (Zettle & Hayes, 1986), self-harm behavior in women with Borderline Personality Disorder (Gratz & Gunderson, 2006), trichotillomania (Woods, Wetterneck, & Flessner, 2006), OCD (Twohig, et al., 2010), and test anxiety (Brown, et al., 2011) to name a few of the topics researched. By teaching and promoting flexibility, individuals can be more present and aware of their behavior and can choose to act in ways that are consistent with their identified values. This way, they are living the type of life they want without hindered by thoughts, feelings, physical sensations, and memories that keep them from their valued life.

To further support this emphasis in teaching flexibility, rather than esteem, the current study found that those individuals endorsing higher self-esteem, reported more psychological symptoms and those with more psychological flexibility reported less psychological symptoms. This could be of particular clinical importance when a client presents with severe depression and

is unhappy with him or her self and current life state. Rather than focusing on symptom reduction such as reducing and challenging the negative thoughts about the self and level of unhappiness related to ones' life, an ACT perspective will aim to highlight the usefulness of tactics an individual has used thus far (like different forms of avoidance). Additionally, it aims to increase behaviors that are more flexible and in direct contact with an individual's values in the presence of the private events (thoughts, feelings, and physical sensations) associated with depression (Zettle, 2007).

General Limitations and Future Directions

Limitations for the current study will be presented in the following order - those related to choice of measures, participants and their characteristics, the study design, and statistical analyses. Based on these limitations, directions for future research in this domain will be presented.

As previously discussed, a self-report measure assessed psychological flexibility, while a creative problem solving task measured cognitive flexibility. The inconsistent manner of measuring different constructs may have impacted the generalizability or the comparability of these two constructs by adding unnecessary error variance in the measurement. Error variance may be decreased in future studies by measuring both constructs in a similar, comparable fashion, by utilizing two self-report measures, or two creative tasks measuring flexibility. Although the candle task is designed to measure cognitive flexibility, further research focused on exploring its construct validity is warranted in light of the current results. For example, future researchers may compare and correlate other creative problem solving tasks to the candle task. In addition, it may be worthwhile to assess self-report measures of cognitive flexibility to the functional fixedness task in order to explore their comparability. In relation to this, it may be

beneficial to explore other forms of psychological flexibility, in addition to the ACT definition of psychological flexibility, as described in Kashdan and Rottenberg (2010). For example, measures of ego-resiliency could also be explored to help further understand the relationship between cognitive flexibility and psychological flexibility, in addition to further developing the psychological flexibility literature.

Participant variables may have impacted the current findings. An individual's level of esteem is related to internal and external contextual factors, such as one's need to present in a socially desirable manner and current life events. To account for this, future research may want to include a measure, like Crowne and Marlowe's (1960) Social Desirability Scale, to account for socially desirable responses. Unusual life stressors may have impacted how individuals feel about themselves; for example, participants may have found out they passed or failed a test before participation in the research study, which may have impacted their self-view and how they felt about themselves in the moment. Others may have been unwilling to endorse psychological symptoms as an attempt to appear and be viewed favorably by others. This study did not account for these factors when considering an individual's self-esteem. Future studies could include ways to incorporate these factors to better inform the self-report of esteem. One way to do this is by asking individuals if anything stressful or exciting happened to them within a certain timeframe and controlling for that variability in their self-report measures.

Additionally, further research should be conducted with larger samples of participants to increase the probability of finding an effect if one truly exists. The current study was limited in external validity due to the convenience sample which consisted of undergraduate students, mostly white females, rather than a more varied sample including individuals from the community. The participants in this study were earning credit for a class requirement or extra

credit. This is biased in that there may be something different about the type of person choosing to sign up for a study versus the student that chose to not do research studies. Also, the participants' major was not attained on the demographics questionnaire. Future studies may investigate whether or not there are differences in flexibility, esteem, and creativity based on self-declared majors. There was a difference in cognitive flexibility based on school classification; it would be interesting to see if one exists based on major degree sought. More specifically, it would be interesting to investigate if there were students that were majoring in the arts or creative writing that differed in the cognitive flexibility task than say, those that are engineering or science majors. Intuitively, perhaps those majoring in art would find more novel ways to solve the cognitive flexibility task, while those with an engineering background may solve the task more efficiently and in less novel ways.

Another limitation to consider is the current study was cross-sectional and only captured the effects of self-esteem, flexibility, and psychological symptoms at one point in time, rather than observing the longitudinal development and change of self-esteem and its related consequences. Future studies may investigate the changing relationship of self-esteem and symptoms across time under different contexts. This could help in understanding how an individual's report of self-esteem and symptomology changes as well as the extent to which their level of flexibility also changes. In addition to this, other limitations with cross sectional research include the inability to infer causation between variables, and missing crucial confounding factors (due to a lack of manipulation of a key variable) that may help to explain the finding between self-esteem, flexibility, and psychological symptoms. It may have been more informative to assess individuals' level of narcissism and social desirability as these factors impact self-esteem.

In future studies, it may be interesting to investigate self-esteem categorically, rather than continuously. For example, Merwin and Wilson (2005) divided self-esteem scores based on the median split; this formed high and low groups around the median of the self-esteem variable. Another way to examine high and low groups is to use data from the first and last quartile of participants. By creating more robust high and low self-esteem groups, it is possible to compare the means on levels of flexibility and psychological symptoms between the two groups. However, these alternative ways of categorizing continuous data come with their own pitfalls, like lowering power, decreasing the measured effect, and wrongfully inferred relationship between variables (MacCallum, Zhang, Preacher, & Rucker, 2002).

The current study suggests further directions for clinical practice. The moderately strong relationship between psychological flexibility and self-esteem suggests individuals that are characterized to have lower self-esteem are present and aware of their behaviors and can choose to behave in a more flexible manner. Rather than focusing on raising individuals' self-esteem, it may be beneficial to help those seeking psychological services become more aware of their life values and work on being open to different possibilities for behaving in ways consistent with the kind of persons they want to be, and encouraging flexibility towards themselves when they may not behave in that way.

A more longitudinal course of future implications relates to incorporating the teaching of psychological flexibility techniques- either in place of, or in addition to some of the self-esteem initiatives in school settings. However, before that goal can be reached, a few major steps must be taken. One, a treatment protocol increasing psychological flexibility in children in the school setting must be created and incorporated. Once that has been established and the effectiveness of the treatment can be explored. Next, it may be important to compare the effectiveness of the self-

esteem based initiatives in the school setting with a psychological flexibility based initiative. Different health outcomes could be followed in this sample of individuals to gather longitudinal effects of both types of initiatives. Lastly, beginning nation-wide exploration may be the final step in increasing the positive effects of psychological flexibility.

Conclusion

This study is the first of its kind and investigated constructs that have not been studied together before. Specifically, the relationships between self-esteem, psychological and cognitive flexibility, and psychological symptoms were explored. Self-esteem, psychological flexibility, and cognitive flexibility were found to be significant predictors of psychological symptoms, and psychological flexibility was found to be a better predictor of psychological symptoms than was cognitive flexibility. Within the undergraduate sample, neither psychological flexibility nor cognitive flexibility moderated the relationship between self-esteem and psychological symptoms. Self-esteem positively correlated with psychological symptoms, while psychological and cognitive flexibility negatively correlated with psychological symptoms.

Self-esteem, while important and related to psychological health, does not provide a clear and complete prediction of psychological outcomes and symptomology. There are many previous findings on the relationship between self-esteem and psychological outcomes, which are inconsistent and contradictory. Rather, in addition to self-esteem, it appears that how an individual responds and interacts to emotions and cognitive stimuli helps predict psychological outcomes and symptomology. With such a strong emphasis on improving and understanding the development of self-esteem in children and adults, data from this study suggest that improving and encouraging flexibility may have a beneficial impact on individuals' psychological symptomology.

APPENDIX A
INFORMED CONSENT

University of North Texas Institutional Review Board

Informed Consent Form

Before agreeing to participate in this research study, it is important that you read and understand the following explanation of the purpose, benefits and risks of the study and how it will be conducted.

Title of Study: Relationships Among Self-Esteem, Thinking and Feeling, and Psychological Symptoms

Principal Investigator: Amy R. Murrell, Ph.D., University of North Texas (UNT) Department of Psychology.

Purpose of the Study: You are being asked to participate in a research study looking at the relationship between self-esteem, thinking and feeling, and how they relate to psychological symptoms.

Study Procedures: If you decide to volunteer, you will complete a series of paper and pencil questionnaires about yourself, your thinking, and feelings in Terrill Hall room 328. The total time for this study is approximately 2 hours.

Foreseeable Risks: Answering questions about your self-esteem or symptomology may be distressing. We do not expect the level of distress you might feel to be any greater than you would feel in your daily life. Also, answering questions about your thinking and feeling might be frustrating. If you do become emotionally distressed, you may stop doing the study. There will be no negative consequences for withdrawal.

Benefits to the Subjects or Others: There will not be any direct benefits of this research to you, other than the experience of being involved in a study. There is a potential benefit to our understanding of complex human behavior and information from this study may be used to develop promoting an individual to think and feel freely in the present moment.

Compensation for Participants: If you are enrolled in an undergraduate psychology course at UNT you will receive four research credits for participation in this study. Students may also choose to write research summaries to earn research credits in lieu of participating in studies. Your decision to participate or to withdraw from the study will have no effect on your standing in this course or your course grade.

Procedures for Maintaining Confidentiality of Research Records: Your name will not be attached to any materials used except for this consent form. You will be assigned a participant number at the beginning of the experiment. This number will be placed on a master list that connects your number to your name. After the study is complete, we will destroy the master list. At that point, there will be no way to connect your name to surveys or data files. All of your materials will be attached to your participant number and not your name. Your informed consent, and the data from this experiment, will be kept in a file cabinet in a locked room in Dr. Amy Murrell's lab in Terrill Hall. Your name will not be used in any research reports or publications that result from this study, nor will your participation be disclosed to any unauthorized persons.

Questions about the Study: If you have any questions about the study, you may contact the Contextual Psychology Lab at (940) 369-8826, or Rawya Al-Jabari at rawyaal-jabari@my.unt.edu or Dr. Amy Murrell at amurrell@unt.edu. Dr. Amy Murrell is a faculty member of the UNT Psychology Department and the sponsor for this project.

Review for the Protection of Participants: This research study has been reviewed and approved by the UNT Institutional Review Board (IRB). The UNT IRB can be contacted at (940) 565-3940 with any questions regarding the rights of research subjects.

Research Participants' Rights:

Your signature below indicates that you have read or have had read to you all of the above and that you confirm all of the following:

- Amy Murrell, Rawya Al-Jabari, or a research assistant working on this project has explained the study to you and answered all of your questions. You have been told the possible benefits and the potential risks and/or discomforts of the study.
- You understand that you do not have to take part in this study, and your refusal to participate or your decision to withdraw will involve no penalty or loss of rights or benefits. The study personnel may choose to stop your participation at any time.
- You understand why the study is being conducted and how it will be performed.
- You understand your rights as a research participant and you voluntarily consent to participate in this study.
- You have been told you will receive a copy of this form.

Printed Name of Participant

Signature of Participant

Date

For the Principal Investigator or Designee:

I certify that I have reviewed the contents of this form with the subject signing above. I have explained the possible benefits and the potential risks and/or discomforts of the study. It is my opinion that the participant understood the explanation.

Signature of Principal Investigator or Designee

Date

APPENDIX B
DEMOGRAPHICS QUESTIONNAIRE

Demographics Questionnaire

1. Age (in years): _____

2. Birthday: _____

3. What is your current level of education? (please circle)

Freshman Sophomore Junior Senior Post-Bachelor's degree
Other _____

4. Sex:

- Male
- Female
- transgender

5. Your approximate yearly income:

- <20,000
- 20,000-50,000
- 50,001-100,000
- >100,000

6. Your ethnicity is:

- Asian/Pacific Islander
- Black/African American
- Hispanic/Latino
- Middle Eastern/Arab
- Native American
- White/Caucasian
- Biracial, please specify _____
- Other, please specify _____

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