

SELF-DISCREPANCY AS A TRANSDIAGNOSTIC FACTOR

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SELF-DISCREPANCY AS A TRANSDIAGNOSTIC FACTOR

Self-discrepancy as a transdiagnostic factor related to fear- and distress-based disorders

by

Jabeene Bhimji

A dissertation

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SELF-DISCREPANCY AS A TRANSDIAGNOSTIC FACTOR

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Self-discrepancy as a transdiagnostic factor related to fear- and distress-based disorders

Dissertation Abstract – Idaho State University (2018)

The transdiagnostic approach to psychopathology focuses on identifying and treating commonalities across psychological disorders (e.g., symptoms, behaviors, processes). Application of this approach enhances our understanding of the mechanisms underlying psychological disorders and enhances treatment effectiveness and efficiency. The current study aimed to investigate the self-regulatory processes underlying fear- and distress-based disorders, a taxonomy of emotional disorders developed through application of the transdiagnostic approach. Informed by Self-Discrepancy Theory, two distinct types of discrepancy (actual – ought and actual – ideal discrepancy) were used to predict symptom severity across fear- and distress-based disorders, respectively. Additionally, indicators of dispositional behavioral motivation tendencies were evaluated as exploratory moderators. As such, a transdiagnostic model capable of addressing multifinality and divergent trajectories was proposed, with discrepancy being evaluated as a common variable that increases risk for multiple disorders, and behavioral inhibition and activation being evaluated as individual differences impacting this relationship. Two online samples (one college and one nation-wide community) completed self-report questionnaires for compensation (N = 353). Structural equation modeling was used to analyze the data and test the proposed models. Findings supported a transdiagnostic model in which discrepancy between one's actual and ideal self-concept predicted symptom severity across distress-based disorders, and discrepancy between one's actual and ought self-concept predicted symptom severity across fear-based disorders. No significant moderation was observed, indicating that the best fitting model addressed only multifinality. While not without limitations,

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findings from the current study have implications for intervention and prompt further research on self-regulation as a transdiagnostic process.

Key Words: Self - discrepancy, self-regulation, transdiagnostic research, fear-based disorders, distress-based disorders

Chapter 1

Literature Review

Introduction

The field of clinical psychology currently identifies psychological disorders based on a categorical system, with diagnoses being determined by the presence or absence of specific symptoms. More recently, however, an increasing emphasis has been placed on a dimensional approach to psychopathology (classifying clinical presentation based on “quantification of attributes rather than assignment to categories” Kraemer, Noda, & O’Hara, 2004, p.17). This can be observed by several dimensional specifiers within the Diagnostic and Statistical Manual Fifth Edition (DSM-5), as well as the changing emphasis in clinical research over the past several years (American Psychiatric Association, 2013). In attempts to understand psychological dysfunction more fully, researchers have begun to place special attention on mechanisms underlying psychopathology. Mechanisms that have warranted such investigation have included research on genetic markers, cognitive processes, emotion regulation, self-regulation, sleep, and anxiety sensitivity, to name a few (Goldstein & Walker, 2014; Kashdan & Rottenberg, 2010; Lenzenweger, 2013; Naragon-Gainey, 2010) .

The current study was developed with the aim of adding to the wealth of research that is being conducted on transdiagnostic processes that contribute to the development and maintenance of psychopathology. Specifically, this study aims to investigate self-regulatory mechanisms using a transdiagnostic approach (looking at self-regulation processes as they relate to multiple psychological disorders simultaneously). Self-Discrepancy Theory (SDT), a theory of self-regulation, posits that when individuals experience differences between their current states and desired end-states, they encounter varying emotional responses (e.g., dejection or

threat/agitation related emotions; Higgins, Klein, & Strauman, 1985). While there have been attempts to understand these distinct emotional responses using transdiagnostic models of psychopathology, none have been effective in capturing them in their entirety. The goal of the current study is to examine SDT in relation to the fear- and distress-based taxonomy of internalizing disorders; a taxonomy developed using a transdiagnostic approach (Krueger, 1999). This is a distinct transdiagnostic taxonomy that closely maps on to the emotional responses outlined within SDT and was developed based on observations of how various emotional disorders co-vary with one another. By investigating self-discrepancies as they relate to this taxonomy, we may gain a more thorough understanding of how transdiagnostic self-regulatory processes impact emotional well-being, and how they may be addressed in treatment most effectively. It is an additional goal of the current study to gain a more thorough understanding of how individual differences in behavioral tendencies interact with these discrepancies to predict symptom severity across fear- and distress-based disorders. The proposed research questions are as follows: Do different types of self-discrepancies predict symptom severity across fear- and distress-based disorders? And is this relationship moderated by reinforcement sensitivity, as measured by Behavioral Inhibition System (BIS)/Behavioral Activation System (BAS) scales? In addressing these research questions, we aspire to develop a transdiagnostic model of self-regulation that accounts for both “multifinality” and “divergent trajectories” of emotional disorders. That is, we hope to gain a more thorough understanding of the mechanisms that not only contribute to symptom severity across the clusters of emotional disorders outlined in the taxonomy (multifinality), but also individual differences that buffer against the development of emotional disorders (divergent trajectories).

The following review serves to provide a basis for understanding the literature supporting the proposed study. First, the transdiagnostic approach to psychopathology will be presented, along with transdiagnostic models of psychopathology to exemplify the approach. Next, existing models of organizing internalizing disorders that are influenced by the transdiagnostic approach will be presented. Third, an introduction to self-regulation will be presented and the importance of self-concept on psychological well-being will be discussed. Fourth, SDT will be described in depth, and research examining the relationship between SDT and psychopathology will be presented. Finally, an integrative summary will be provided, highlighting existing gaps in the literature that will be addressed by the proposed study and the current study's purpose and hypotheses will be presented.

The Transdiagnostic Approach to Psychopathology

Over time, psychopathology has been conceptualized using various approaches. While early psychologists looked for root causes to explain general psychological distress, current approaches tend to conceptualize psychopathology from a categorical standpoint, which emphasizes differences between various forms of mental illness rather than their similarities. Clusters of symptoms currently define psychological disorders, and criteria have been developed to determine whether or not an individual's psychological difficulties can be understood within the context of a particular label (Krueger & Piasecki, 2002). Though the current taxonomy for understanding mental illness is categorical in nature, this has vacillated over the course of history.

Claude Bernard, father of experimental psychology, proposed that psychological disorders resulted from dysfunction in quantity of behavior, rather than a quality of behavior (Bickel, Johnson, Koffarnus, MacKillop, & Murphy, 2014). That is to say that a particular

behavior is not inherently dysfunctional (qualitative variable), rather abnormal frequency, intensity, and duration of a behavior (quantitative variables) contributes to psychopathology. This framework lent itself to the development of a dimensional approach to psychopathology (Bickel et al., 2014), which emphasizes quantity of thoughts, feelings, and behaviors rather than quality. The shift towards a dimensional approach was further influenced by the observation that psychological disorders, especially mood and anxiety disorders, are often highly comorbid with one another (Wilamowska et al., 2010). This observation highlighted the unclear distinctions across psychological disorders and the decreased utility of the prototypical categorical approach to psychopathology. In a large study, 1,127 adult outpatients (age 18-64) were assessed for lifetime and current diagnoses of anxiety and mood disorders, as defined in the Diagnostic and Statistics Manual, Fourth Edition (DSM-IV; American Psychiatric Association, 2000). Findings demonstrated that 55% of patients presenting with a current anxiety disorder diagnosis also presented with at least one other anxiety or mood disorder. When considering lifetime diagnoses, this percentage rose to 76% (Brown, Campbell, Lehman, Grisham, & Mancill, 2001). These statistics emphasize the large degree of overlap across internalizing disorders (typically defined as affective and anxiety disorders; Krueger, 1999). All of the above stated findings have influenced researchers and clinicians alike to revisit the notion of identifying and treating underlying mechanisms spanning across emotional disorders; this movement has been labeled the transdiagnostic approach.

Another factor contributing to the shift towards a transdiagnostic approach to psychopathology comes from the observation that treatments designed to target a specific disorder often result in decreased symptom severity of comorbid disorders as well (Wilamowska et al., 2010). For example, one study investigated 55 patients with a primary diagnosis of

Generalized Anxiety Disorder (GAD), and found that for those who had successfully completed therapy, symptom severity of additional diagnoses was significantly decreased at 12-month follow up (Borkovec, Abel, & Newman, 1995). Similarly, a study investigating the impact on comorbid conditions using cognitive-behavioral treatment for panic disorder found substantial decreases in symptom severity of comorbid conditions at post-treatment (Tsao, Lewin, & Craske, 1998). Research investigating neurological structures and activation as it relates to psychopathology has provided further evidence for the utility of the transdiagnostic approach. Several studies have demonstrated that increased bottom up processing, paired with dysregulation of cortical inhibition of the amygdala response is common across a variety of disorders including social anxiety disorder (SAD), GAD, post-traumatic stress disorder (PTSD), specific phobia and depression (Goldapple et al., 2004; Paulesu et al., 2010; Wilamowska et al., 2010). These observations and empirical findings highlight the commonalities underlying internalizing disorders that are highly comorbid with one another. This research has bolstered movement towards further development and support for the transdiagnostic approach to psychopathology. While the “transdiagnostic approach” is a contemporary label for a particular type of investigation surrounding psychopathology, research on underlying factors of psychopathology has been conducted for several decades. The use of this new term aids in communication among researchers and clinicians.

Theoretical rationale for the transdiagnostic approach largely stems from the work of Barlow, who from the early 1990’s initiated research towards the development of the “triple vulnerability model” (Barlow, 2000; Barlow, 2014; Barlow, 1991). This model proposes that there are commonalities in etiology across psychological disorders, and that three distinct vulnerabilities contribute to the manifestation of psychopathology. The three vulnerabilities

outlined in this model are generalized biological vulnerabilities, generalized psychological vulnerabilities, and specific psychological vulnerabilities established in early learning (Barlow, 2000; Suárez, Bennett, Goldstein, & Barlow, 2008). While generalized biological vulnerabilities are thought to be heritable, non-specific contributors to the development of negative affect (e.g., genetic contributors), generalized psychological vulnerabilities stem from early life experiences and contribute to the general belief that negative life events are uncontrollable or unpredictable (e.g., early childhood neglect; Barlow, 2014). Should an individual experience both generalized biological and psychological vulnerabilities, GAD and/or depression often manifest. However, should an individual encounter more specific learning experiences, distinct psychopathologies may emerge. For example, in the development of panic disorder, the triple vulnerabilities model would suggest that a genetic contribution towards negative affect (generalized biological vulnerability), paired with a decreased sense of control over the experience of emotions (generalized psychological vulnerability) and high sensitivity to physiological signs of anxiety as a result of early learning (specific psychological vulnerability) would interact with one another in the development of this specific manifestation of psychopathology (Bentley et al., 2013). This model has largely guided research on transdiagnostic models of psychopathology, as well as transdiagnostic treatments (Barlow, 2011; Nolen-Hoeksema & Watkins, 2011).

An initiative titled the Research Domain Criteria (RDoC) Project, funded by the National Institute of Mental Health (NIMH) has been instrumental in the development of new research projects focused on this transdiagnostic approach to psychopathology (Simmons & Quinn, 2013). In the development of the RDoC, several domains were emphasized as potential areas of interest for transdiagnostic research. These domains include negative valence systems (acute threat, potential threat), positive valence systems (approach motivation, reward valuation),

cognitive systems (attention, perception), cognitive effortful control (goal selection, performance monitoring), and several others. Further, the RDoC emphasizes the need to evaluate these domains across multiple levels of analysis. That is, emphasis on investigation across biological, behavioral, and self-report research methods is a crucial component to the approach, as this in-depth investigation serves to elucidate a more thorough understanding of the etiology of psychopathology, as well as the factors that determine how and why psychopathology manifests.

Utility of the Transdiagnostic Approach

Transdiagnostic research as it relates to psychopathology is beneficial to the field for several reasons. Transdiagnostic research is crucial to understanding etiological factors associated across psychopathologies, so as to prevent the manifestation of psychological disorders. For example, studies have demonstrated the presence of common risk factors across various forms of psychopathology, highlighting important variables to target for prevention of multiple disorders. These risk factors include negative thinking, parental features (e.g., parenting style, history of mental health, etc.), responses to stress, and temperamental variables (Arditte, Shaw, & Timpano, 2016; Dozois, Seeds, & Collins, 2009). Not only does use of the approach further our understanding of psychopathology, but it also offers clinical utility.

There are several advantages for using transdiagnostic models of psychopathology in treatment over traditional disorder-specific models. While there is clear evidence supporting the approach as a whole, use of transdiagnostic models enhances our understanding of processes (biological, cognitive, behavioral, etc.) underlying psychological disorders that frequently co-occur, and guide us towards a more parsimonious understanding of psychopathology. The ability of transdiagnostic models to identify psychological processes related to multiple disorders may simplify training in treating these disorders, and also shorten treatment length thereby decreasing

attrition (Mansell, Harvey, Watkins, & Shafran, 2009). For example, a patient may present with both anxiety and depression. Rather than focusing on treating symptoms of anxiety followed by treatment for symptoms of depression, a clinician could utilize a transdiagnostic approach and target the underlying process of repetitive negative thinking which is present in both anxiety and depression. That is, transdiagnostic treatment would then address both presenting issues and could result in improvement of both disorders but in a shorter time frame than traditional models wherein each disorder would be treated separately. While often times we see decreases in symptom severity of comorbid conditions when treating a primary diagnosis, understanding the processes underlying multiple disorders may streamline treatment, and further enhance effectiveness (Borkovec et al., 1995; Tsao et al., 1998).

One well-validated treatment for emotional disorders is the Unified Protocol for Transdiagnostic Treatment for Emotional Disorders (UP; Barlow, 2011). This protocol uses five core treatment modules to target transdiagnostic processes: increasing present focused emotional awareness, increasing flexible thinking, identifying and preventing tendencies towards emotional avoidance, altering maladaptive emotion-driven behaviors, increasing awareness and tolerance to physiological symptoms of emotions, and emotional exposures (Farchione et al., 2012). Several studies investigating the efficacy of this treatment have emerged with convincing results. A randomized controlled trial applied the protocol with high degrees of standardization (Farchione et al., 2012). While the primary diagnosis of participants was an anxiety disorder, the 37 participants presented with a variety of psychological disorders with varying degrees of comorbidity. Participants were randomly assigned to a treatment or 16-week wait-list control group. Symptoms of anxiety, depression, negative affect (NA), and functional impairment were assessed before treatment, immediately following treatment, and at 6-month follow up. Results

showed decreases on clinical severity ratings for principal diagnoses ($p < .001$), as well as on general measures of anxiety ($p = .034$), depression ($p < .001$), clinician-rated anxiety ($p < .001$), clinician-rated depression ($p = .089$), functional impairment ($p < .001$), and NA ($p = .001$). Increased positive affect (PA), conceptualized as “pleasurable engagement with the environment” and subjectively experienced as increases in positive emotions (Watson, Clark, & Carey, 1988 p.347), was also observed following treatment ($p = .001$). Furthermore, treatment had a substantial impact on comorbid diagnoses. Notably, while at pre-treatment, 47% of comorbid diagnoses were rated as subclinical, this number increased to 76% at 6-month follow-up, demonstrating efficacy of transdiagnostic treatments on decreasing symptom severity of comorbid conditions over time (Farchione et al., 2012). A follow-up study evaluating the efficacy of the UP after 24 months found that the gains made as a result of treatment were sustained over an extended time frame. Clinical severity of principal diagnoses from pre-treatment to post-treatment was significantly decreased at 24-month follow up ($p < .001$), as was the number of clinical diagnoses ($p < .001$; Bullis, Fortune, Farchione, & Barlow, 2014).

Taken together, the literature supports the benefits of the transdiagnostic approach for both the understanding and treatment of psychopathology. By enhancing our knowledge on mechanisms underlying psychopathology, prevention and treatment can be executed more effectively. In addition to identifying risk factors in psychopathology development, results from transdiagnostic research may further our understanding psychopathology on a broad level, allowing us to target mechanisms underlying multiple disorders, and treating psychopathology more efficiently. Now that support for contributing to transdiagnostic research and intervention has been presented, I will move on to discuss the development of transdiagnostic models of psychopathology, as this is an aim of the current study.

Transdiagnostic Models of Psychopathology

A heuristic for developing transdiagnostic models. According to a widely cited heuristic for developing transdiagnostic models, transdiagnostic models are thought to be of theoretical and practical value when they can account for multifinality and divergent trajectories (Nolen-Hoeksema & Watkins, 2011). “Multifinality” refers to the process by which certain transdiagnostic variables simultaneously increase risk for multiple different types of psychological disorders, whereas “divergent trajectories” refers to the why the same transdiagnostic factor can lead to different forms of psychopathology across individuals and over time. The capacity for a model to elucidate issues of multifinality and divergent trajectories depends on which level of transdiagnostic risk factors are incorporated into the model; distal risk factors, proximal risk factors, and/or moderating risk factors (Nolen-Hoeksema & Watkins, 2011).

Distal risk factors refer to risk factors that are either environmental or biological in nature, and are relatively distant (in time) from the manifestation of a disorder. Distal risk factors can be understood as risk factors that are out of the control of the individual possessing them. Furthermore, distal risk factors can be understood as factors contributing to multifinality. That is, a distal risk factor is often responsible for increased likelihood of developing several forms of psychopathology. Examples of distal risk factors include early childhood abuse or neglect, early social stressors, biological underpinnings, family history of mental illness, and so forth. Though an individual may possess distal risk factors, the manifestation of psychological symptoms only occurs upon interactions with more proximal risk factors.

Proximal risk factors are within-person variables that are more closely related in time to symptom development and the manifestation of psychopathology (Nolen-Hoeksema & Watkins,

2011). Often times, the presence of distal risk factors act as catalysts for proximal risk factors. For example, early life experiences (distal factors) may play a significant role in the development of specific cognitive processing biases (proximal factors) that contribute to the manifestation of psychopathology. Proximal risk factors, such as cognitive processing bias, may contribute to the development of depressive symptoms. However, this same factor may contribute to the development of social anxiety should different moderating risk factors be present. In this sense, proximal risk factors further contribute to multifinality. Investigating the interaction between proximal and moderating risk factors, however, can elucidate the divergent trajectories that result in the manifestation of specific psychological disorders.

Moderating risk factors play a role in determining which particular symptoms will manifest as a result of proximal risk factors. That is, moderating risk factors may increase the likelihood that proximal risk factors lead to specific symptoms and/or influence symptom severity. Moderating risk factors are typically observed to work in three ways. They may work to raise concerns or themes that proximal factors act upon (e.g., social stress), they might shape responses through conditioning (e.g., exposure to and reinforcement of substance use), or they may determine reinforcement value of certain stimuli (e.g., high reward sensitivity to food), thereby impacting the manifestation of symptoms (Nolen-Hoeksema & Watkins, 2011).

There are generally three underlying mechanisms linking distal and proximal risk factors. First, distal risk factors may shape how an individual responds to their environment. Second, distal factors can shape cognitions associated with self-beliefs, schemas and self-images, so as to create proximal factors (Cicchetti & Toth, 2005). Finally, conditioning and learning may play a role in linking distal and proximal risk factors. For example, parents with various forms of psychopathology may not have effective coping skills and thus may not be able to teach effective

coping skills to their offspring. Thereby the proximal factor of ineffective coping may influence the manifestation of psychopathology in that offspring (Eisenberg, Spinrad, & Eggum, 2010).

Moderating risk factors then play a role in determining the specific symptoms that manifest.

As an example, imagine an individual who experienced abuse in early life, and was raised by parents with an over-controlling parenting style (distal risk factors). This has led to dysregulation in his stress response, a sense that the world is dangerous, and an underlying belief that he is unprepared to cope with life stressors. Based on these mechanisms, this individual has developed the tendency to engage in negative repetitive thought patterns (proximal risk factor). Should this individual be experiencing life events associated with failures (moderator), he may be more likely to develop depressive symptoms. In contrast, should this individual be experiencing life events related to social stressors (moderator), it might be the case that anxiety symptoms are more likely to manifest (Nolen-Hoeksema & Watkins, 2011).

This section serves to outline important factors to consider when developing a transdiagnostic model for various forms of psychopathology. Now that I have outlined important components of transdiagnostic models, I will highlight two prominent transdiagnostic models of psychopathology to serve as models for the current study.

Cognitive emotion regulation strategies: A transdiagnostic model. A widely cited transdiagnostic model of psychopathology (the cognitive emotion regulation strategies model) examines the relationship between cognitive emotion regulation strategies and psychological symptoms related to depression, anxiety, and eating disorders (Aldao & Nolen-Hoeksema, 2010). Cognitive emotion regulation strategies refer to cognitive strategies implemented to alter one's emotional experience. Typical strategies outlined in scientific literature include rumination, suppression, dampening, reappraisal and problem-solving (Aldao & Nolen-Hoeksema, 2010;

Feldman, Joormann, & Johnson, 2008). Some of these strategies are understood to be more adaptive than others. For example, rumination and suppression are commonly labeled as maladaptive strategies, while problem solving and reappraisal are typically understood to be more adaptive. This determination is largely due to the relationship between “maladaptive strategies” and psychopathology, as well as the relationship between “adaptive” strategies and healthy psychological functioning (Aldao & Nolen-Hoeksema, 2010). Notably, the “adaptiveness” of an emotion regulation strategy is dependent on context, in that while suppression may be an adaptive skill for an individual undergoing abuse, it may contribute to substantial psychopathology several years later, when this individual is no longer in an abusive environment. “Adaptiveness” largely depends on the match between strategy and context. Therefore, it is notable that while there is no steadfast rule with regard to which strategies are conceptualized as adaptive versus maladaptive, they are most frequently conceptualized this way in the literature due to their broad associations with psychological well-being (Geenen, van Ooijen-van der Linden, Lumley, Bijlsma, & van Middendorp, 2012).

Various cognitive emotion regulation strategies have been examined across a wide variety of psychological symptoms related to depression, eating disorders, and anxiety. This research finds that not all cognitive emotion regulation strategies are significantly correlated, and that the latent variable of “Cognitive Emotion Regulation” is best characterized by rumination, suppression, and reappraisal. Furthermore, it has been demonstrated that maladaptive emotion regulation strategies (rumination and suppression) are positively correlated across symptoms of depression, anxiety, and eating disorders. In contrast, adaptive emotion regulation strategies (reappraisal and problem solving) are negatively correlated with these symptoms of psychopathology. An important finding was also observed that adaptive cognitive emotion

regulation strategies showed a weaker relationship with psychopathology than maladaptive cognitive emotion regulation strategies. That is, the presence of maladaptive strategies is more damaging to psychological well-being than adaptive strategies are protective (Aldao & Nolen-Hoeksema, 2010; Aldao, Nolen-Hoeksema, & Schweizer, 2010). This model looked at proximal risk factors (e.g., cognitive emotion regulation strategies) as they relate to symptoms of eating disorders, depression, and anxiety. By examining how these strategies related to psychopathology transdiagnostically, this model examined multifinality.

Repetitive negative thinking and affective disorders. One particular transdiagnostic model that has been widely cited (the repetitive negative thinking model) relates repetitive negative thinking to symptoms of affective disorders including depression, social anxiety, body dysmorphic disorder (BDD), and obsessive-compulsive disorder (OCD) (Arditte, Shaw, et al., 2016). This model was developed by observing similar tendencies towards both rumination (typical of depressive disorders) and worry (typical of anxiety disorders) across depressive and anxiety-related disorders. That is, individuals who suffer from major depressive disorder (MDD), GAD, and SAD typically report similar amounts of worry and rumination (McEvoy, Watson, Watkins, & Nathan, 2013).

Based on the similarities between worry and rumination, and their high tendency to co-occur across affective disorders, Arditte and colleagues (2016) examined the latent construct of “Repetitive Negative Thinking”, and explored its utility in predicting symptoms of depression, social anxiety, BDD, and OCD. Findings supported the transdiagnostic utility of repetitive negative thinking, as the construct significantly predicted symptoms across all investigated affective disorders. This model once again explored a proximal risk factor (e.g., repetitive negative thinking) contributing to affective disorder and highlighted the multifinality associated

with repetitive negative thinking.

The relationship between the cognitive emotion regulation strategies model and the repetitive negative thinking model becomes clear when we consider the likeness between rumination and repetitive negative thinking. Noting this relationship (as rumination is one particular form of repetitive negative thinking) it is apparent that the two transdiagnostic models inform one another, thereby pushing the field towards understanding how these transdiagnostic processes contribute to psychopathology. Notably, while these models possess similarities and differences, they do not act as competing models. Independently, each model enhances our understanding of underlying processes occurring across emotional disorders.

These models underscore the importance of examining mechanisms underlying psychopathology using a transdiagnostic approach. While the aforementioned cognitive processes have been examined using this approach, other mechanisms of similar importance to psychological well-being (e.g., self-regulation processes, motivational processes) remain largely unexplored using a transdiagnostic approach. Now that I have provided examples of transdiagnostic models and highlighted the capacity for models to influence one another, I will outline different methods of organizing psychological disorders that have largely benefited from transdiagnostic models of psychopathology.

The Organization of Psychopathology Using a Transdiagnostic Approach

There are several proposed methods of organizing psychopathology based on a transdiagnostic approach. While some of these taxonomies were established prior to the transdiagnostic movement, others that were developed decades prior continue to be updated and used within the context of transdiagnostic research and clinical practice. Prior to discussing particular taxonomies of psychological disorders, I will discuss the importance of re-evaluating

the organization of psychological disorders.

The Diagnostic and Statistical Manuals, for several iterations, have organized psychopathologies based on phenomenological features (David Watson, O'Hara, & Stuart, 2008). That is, disorders have typically been grouped with one another if they seemingly fit together based on observable features. For example, depressive disorders are characterized by disturbances in mood, whereas anxiety disorders are characterized by symptoms of anxiety and avoidance (David Watson et al., 2008). Early classification systems emphasized the relationship between distinct emotions and specific maladaptive responses that occurred as a result. This reductionist view of psychological health was largely undermined by observations of comorbidity across distinct categories of psychological disorders, and by contemporary research acknowledging the importance of positive and negative affect (PA, NA) to the development of psychopathology (David Watson et al., 1988). NA was empirically demonstrated to underlie all psychological disorders characterized by emotions such as fear, sadness, threat, guilt, and so forth. While this scientific discovery did not undercut the need for distinction across mood and anxiety disorders, it prompted thought regarding the similarities across internalizing disorders. The investigation of underlying factors contributing to psychopathology more broadly prompted researchers and clinicians alike to question the organization of the DSM, and explore other methods of organizing psychological disorders with increased accuracy and empirical support (Clark & Watson, 2006; Krueger, 1999; Watson et al., 2008; Wright et al., 2013). As the purpose of identifying and labeling psychological disorders is to enhance treatment success and ameliorate communication among mental health professionals, the scientific exploration of taxonomies is crucial to the field. In turn, the use of new transdiagnostic literature to enhance these taxonomies is an important step in providing the best care for patients and communicating

underlying psychological processes contributing to psychological disorders.

As indicated, several taxonomies for categorizing internalizing disorders emerged following the identification of similarities across mood and anxiety disorders. Notably, however, these systems of organization were largely rooted in early literature and were not influenced by the wealth of transdiagnostic research that exists today. These taxonomies, however, are instrumental for transdiagnostic research, as they provide excellent starting points for organizing psychopathology based on underlying features and mechanisms. It is also notable that these taxonomies continue to be investigated and refined by transdiagnostic researchers, demonstrating their utility to the field (Bruch, Rivet, & Laurenti, 2000; Wright et al., 2013). Now that I have discussed the development and utility of transdiagnostic taxonomies of psychological disorders, I will outline two specific taxonomies that continue to be examined in the transdiagnostic field.

The tripartite model of emotional distress. Clarke and Watson first proposed the tripartite model of emotional distress in 1991. This model primarily uses dimensions of affect (NA, PA) in understanding the organization of psychopathologies, and builds off of these dimensions to more accurately capture the unique features of anxiety and depression (Watson & Tellegen, 1985). The tripartite model posits three distinct factors associated with emotional distress: general distress, nonspecific symptoms of depression (e.g., feeling sad, anhedonia), and nonspecific symptoms of anxiety (e.g., feeling nervous, physiological hyperarousal).

The motivation for developing a new model of anxiety and depression largely stemmed from research investigating comorbidity rates, as well as affective underpinnings of psychological distress (Clark & Watson, 1991; Watson et al., 1988, 2008). In their initial steps to evaluate some of the underlying factors of anxiety and mood disorders, a factor analysis was completed on the 10 most commonly used anxiety and depression measures: the Beck

Depression Inventory (BDI), Costello-Comrey scales for depression and anxiety (CC-D, CC-A), Minnesota Multiphasic Personality Inventory Depression Scale (MMPI-D), a composite of five MMPI-based anxiety and NA markers identified by Watson and Clark in 1984 (MMPI-A), State-Trait Anxiety Inventory Trait Anxiety Scale (STAI-T), Institute for Personality and Ability Testing Anxiety Scale (IPAT), Multiple Affect Adjective Check List Depression and Anxiety scales (MAACL-D, MAACL-A) and the Zung Self-rating Depression Scale (Zung – SDS; Clark, Watson, Becker & Kleinman, 1991). Factor analysis revealed that all measures loaded on to two distinct factors: generalized NA/distress (largely indicated by the BDI and MMPI anxiety scales) and fearful mood (largely indicated by the CC-A).

Though two factors were evident following analysis, these two factors did not effectively account for the unique experience of depression. Lack of a distinctive depression-related factor prompted further analyses of self and clinical ratings of neurotic symptoms. Review of symptom-level analyses, conducted by Clark and colleagues (1991) revealed two distinctive patterns. While one of these patterns largely reflected their initial findings (two factors: general distress and anxiety), another pattern exhibited a three-factor model. Within this model a broad factor of general distress was observed, as well as distinctive factors for depression and anxiety. The identified depression factor was characterized by loss of interest, crying, anhedonia, hopelessness, loneliness, suicide ideation, and depressed mood, while the identified anxiety factor was characterized by feelings of tension, nervousness, shakiness, and panic (Clark & Watson, 1991). These three factors parallel findings related to affect across internalizing disorders (Watson et al., 1988). While NA has been largely observed across internalizing disorders, mapping on to the factor of general distress, decreased PA has predominantly been observed across depressive disorders, linking this affective dimension to the depressive factor

observed by Clark and Watson. Clark and Watson also specify physiological hyperarousal as a unique contributor to the experience of anxiety. Taken together, these studies supported a tripartite model to best understand anxiety and depressive disorders. These three factors best accounted for the commonalities across internalizing disorders, while also explaining the differences between anxiety and depression, and therefore became the three components of the tripartite model of emotional distress.

Following its development, these same investigators sought to test the newly proposed tripartite model of emotional distress. They did so by administering a 90-item mood and anxiety symptom questionnaire (MASQ; Watson, Weber, et al., 1995) to five different samples (3 student, 1 adult, 1 patient) and conducting factor analyses on the results. Across samples, the three distinct factors of the tripartite model were supported, providing further evidence for the validity of this model (David Watson, Clark, et al., 1995). While these findings were observed over 20 years ago, they continue to be explored and investigated, with substantial evidence suggesting the utility of this framework in contemporary research (Brown, Chorpita, & Barlow, 2015; Bruch et al., 2000; Hughes et al., 2006; Laurent & Ettelson, 2001)

A more recent study investigated the utility of the tripartite model in understanding structural relationships among dimensions of DSM-IV mood and anxiety disorders (Brown et al., 2015). It was hypothesized that anxiety and depressive disorders could be conceptualized using the tripartite model. Specifically, it was hypothesized that a significant path between the higher-order factor of NA and all internalizing disorders would be observed. This would account for the general distress factor of the tripartite model. Next, it was hypothesized that a significant path from the higher-order factor of PA to depression would be observed, accounting for the distinct depression factor in the tripartite model (characterized by low PA). Finally, it was hypothesized

that DSM-IV anxiety disorders (GAD, OCD, panic disorder with agoraphobia, social phobia) would have significant paths with the lower order factor of autonomic arousal, accounting for the physiological hyperarousal component of the tripartite model. Findings supported this organization of DSM-IV disorders; with model fit indices indicating good fit [χ^2 (255) = 579.36, comparative fit index (CFI) = .94, incremental fit index IFI = .94, root-mean-square error of approximation (RMSEA) = .06, goodness of fit index (GFI) = .89]. Findings also indicated NA was most highly correlated with GAD and depression, consistent with past literature, and in line with predictions from the triple vulnerability model which posits that both depression and generalized anxiety disorder are indicators of overarching psychological distress (Barlow, 2014). Notably, contrary to previous accounts, this study revealed that SAD, similarly to depression, was observed to have a distinct relationship with PA (low PA associated with SAD). This finding suggests that using affect to organize internalizing disorders may not entirely capture the structure of psychological disorders, as social anxiety and depression, while correlated, do not fit within the same latent structure according to the model.

While using affective dimensions to understand psychopathology is one meaningful way of doing so, it is not without drawbacks. The tripartite model fails to explain the high degree of comorbidity between GAD and depression, as well as the shared influence of PA on both depression and social anxiety. Other taxonomies have been developed to address some of the limitations of the tripartite model. The fear- and distress-based disorder taxonomy was developed through the examination of how psychological disorders co-vary with one another.

The fear- and distress-based disorder taxonomy. In contrast with the previous model which was developed based on dimensions of affect, the fear- and distress-based disorder taxonomy, initially proposed by Krueger (1999), was developed based on patterns of

comorbidity observed across internalizing disorders. High rates of comorbidity prompted Krueger to evaluate the parsimony of the current classification system, and empirically evaluate overarching themes that present across highly comorbid disorders (Krueger, 1999). Initial development of this taxonomy was based on confirmatory factor analysis of 10 common mental disorders (major depression, dysthymia, GAD, SAD, simple/specific phobia, agoraphobia, panic disorder, alcohol dependence, drug dependence and antisocial personality). Confirmatory factor analysis was used to identify correlations among psychological disorders by empirically demonstrating the presence of a smaller number of latent constructs. The sample of 8,098 individuals was drawn from the National Comorbidity Survey, which focused on lifetime prevalence rates of psychological disorders. Krueger examined a wide range of psychological disorders, which were not limited to internalizing disorders.

As a means of determining the optimal organization of these disorders, Krueger compared several models with one another. These models possessed 1 to 4 latent factors, and indices of model fit were examined across models. While his 1-factor model examined all of the above-indicated disorders as a unified factor, his 2-factor model examined internalizing disorders (affective and anxiety disorders) and externalizing disorders (antisocial personality, substance use, alcohol use). His 3-factor model, in contrast, was a variant of his two-factor model, in which externalizing disorders constituted one factors, and internalizing disorders were bisected into anxious-misery (or distress-based) disorders and fear-based disorders. Krueger's 4-factor model was largely derived from the organization characteristic of the DSM, in that affective disorders (depression and dysthymia), anxiety disorders (GAD, panic disorder, agoraphobia, SAD, and specific phobia), substance use disorders (alcohol, drug), and antisocial behavior disorders (antisocial personality disorder) were examined independently.

Results demonstrated good indices of model fit using the 3-factor model, supporting the anxious-misery (distress) and fear distinction across internalizing disorders. These model indices were far superior to other models. Model fit was determined by examining root mean residual scores (RMR), the Chi-square goodness of fit statistic (χ^2), and the Bayesian information criterion (BIC). Notably, though these four models were examined in the entire sample, in random split halves of the sample, and across genders, results consistently supported the 3-factor model. Notably, the 3-factor model was the only model to produce a negative BIC score, which is an indicator of good fit compared to other models.

Since Krueger's identification of two distinct internalizing factors (fear-based and distress-based), much research has been conducted with hopes of further confirming the structure of common psychological disorders, and furthering the understanding of anxious-misery (distress) and fear-based disorders. One such study conducted a similar confirmatory factor analysis, however it explored the latent structure of 12-month DSM-III-R (Diagnostic and Statistics Manual, Third Edition, Revised) diagnoses (Vollebergh et al., 2001). As such, the study sought to explore the stability of underlying latent structures of psychological disorders over a 12-month period. While previous research had investigated the latent structure of internalizing disorders in a cross-sectional manner (at one time point), this study sought to explore the stability of this structure. This study, conducted in the Netherlands, used the Netherlands Mental Health Survey and Incidence Study (NEMESIS) data, where two diagnostic interviews occurred 12 months from one another. Several models were tested with regard to the structure of the evaluated psychological disorders, with one of these models closely resembling Krueger's. The best fitting model identified 3 latent structures, observed to be stable over a 12-month period. While one latent structure was specific to substance use disorders, a latent factor

incorporating depression, dysthymia and GAD was found (distress), as was a factor that accounted for specific/simple phobia, social phobia, agoraphobia, and panic disorder (fear). Another nation-wide survey in Australia found support for a similar structure of internalizing disorders as well, further bolstering evidence for the anxious-misery (distress) and fear-based disorder distinction (Slade & Watson, 2006). It is notable that while Krueger's initial model did not examine all psychological disorders with internalizing symptoms, replications have been conducted to examine the placement of disorders such as PTSD. For example, a replication by Cox in 2002 found that PTSD best loaded on to the latent variable of distress. However, PTSD was the weakest indicator of the latent construct, with a factor loading of only -.39 in contrast with GAD, depression and dysthymia, whose factor loadings ranged from -.64 to -.83 (Cox, Clara, & Enns, 2002).

Examining this proposed structure across a biological level of analysis, a study by Kendler in 2003 using twin data to examine genetic risk associated with psychiatric disorder found that the structure of genetic risk factors largely resembled the structure of common psychological disorders as proposed by Krueger (Kendler, Prescott, Myers, & Neale, 2003). Furthermore, a review published by Watson (2005) compiled evidence across a range of studies to examine the empirical evidence supporting the restructuring of internalizing disorders. He posited that current evidence suggests internalizing disorders should fall under 3 subclasses: distress-based disorders (dysthymia, depression, GAD, PTSD), fear-based disorders (panic disorder, agoraphobia, social phobia, and specific phobia), and bipolar disorders (bipolar I, bipolar II, and cyclothymia). While noting that there is much room for further study (e.g., determining the placement of OCD), a large conglomeration of literature supports these distinctions.

To highlight the remaining need for continued research on how psychological processes relate to the structure of psychological disorders, a recently published review evaluated whether differences in cognitive and behavioral mechanisms underlying psychological disorders (including threat cue conditioning, stress reactivity, and information processing biases) were consistent with the distinction between anxious-misery (distress) and fear-based disorders, or if they were consistent with the current separation of anxiety and depressive disorders (Craske et al., 2009). While consistencies with the dichotomous taxonomy (fear, anxious-misery) were found, including a distinctly different relationship between GAD and physiological arousal in comparison with other anxiety disorders, they largely concluded that literature was lacking to comprehensively evaluate the utility of the fear- and anxious-misery taxonomy. This is largely due to the lack of studies examining depression and anxiety together as they relate to cognitive processes, due to the long-held distinction between the two categories of disorders across DSM iterations. Notably, this review highlighted several distinctions in psychological processes across anxiety disorders, further emphasizing the need for research on how psychological processes relate to internalizing disorders more broadly. For example, differences in stress reactivity were observed across anxiety disorders, in that while literature supports elevated anticipatory anxiety in response to generic threat in PTSD and panic disorder, other anxiety disorders are characterized by elevated acute fear to disorder-specific threat (PTSD, SAD, specific phobia). This review concluded by emphasizing the need for comparative research regarding how psychological processes distinguish anxiety and depressive disorders to further our understanding and treatment of internalizing disorders.

The current study seeks to help fill this research need by examining some of the psychological processes underlying distress- and fear-based disorders. Specifically, the cognitive

process of interest within the current study relates to self-regulation. Self-regulation is a vast construct that spans multiple levels of analysis. Nevertheless, the construct provides rich ground for investigation with regard to how cognitive self-regulatory processes are related to emotional disorders. Self-regulation will now be described and discussed.

Self-Regulation

Self-regulation is broadly defined as “a coordinated set of psychological processes guiding goal-directed behavior” (Klenk, Strauman, & Higgins, 2011 p.935). An essential component of self-regulation is the process of self-corrective adjustment that aids an individual in serving their goals. Broadly speaking, these goals can be understood as desired end-states, and can be achieved by means of obtaining desired end-states, or avoiding undesirable end-states (Vohs & Baumeister, 2011). Given this broad definition of self-regulation, it is not surprising that self-regulatory processes have been examined across various fields of psychology, including personality, developmental, cognitive, clinical, and social psychology, to name a few (Vohs & Baumeister, 2011). The focus of the proposed study is emotions as they relate to cognitive self-regulatory processes. Specifically, the current study aims to evaluate how regulation around self-concept can impact psychological outcomes. Self-concept can be understood as a multifaceted construct, referring to what comes to mind when one thinks of the self, one’s own personality, and what an individual believes is true of the self (Leary & Tangney, 2012). Self-concept is an important self-regulatory tool, as it provides a basis for individuals to engage in reflection and decision-making based on beliefs about the self. As such, individuals who maintain an incoherent self-concept (e.g. self-representation varies across social roles and contexts) have been shown to experience more negative affect than those who exhibit a more coherent and developed self-concept. Similarly, individuals who experience more congruence with regard to

how their current-self-concept relates to their ideal or “ought” concept experience greater psychological well-being (Higgins et al., 1985). The understanding of self-concept is essential to the understanding of self-regulation, as this reflects one’s self-representation.

Self-discrepancy theory (SDT), a theory of self-regulation as it relates to self-concept congruence, emphasizes self-regulatory processes as mechanisms by which one obtains pleasure and avoids pain (Higgins, 1997). This theory has demonstrated an association between failure to achieve approach-related goals and feeling of sadness, and failure to achieve avoidance-related goals and feelings of agitation or threat (Higgins, 1997). Notably, approach and avoidance motivation are important constructs outlined in the RDoC project, constituting domains that likely contribute to underlying mechanisms crosscutting various psychopathologies. Studies have been conducted examining this theory in relation to specific psychological disorders, however there is a dearth of literature examining this theory using a transdiagnostic approach. Therefore, research further investigating this theory using a transdiagnostic approach is needed as a means of advancing our understanding of how motivational mechanisms are associated with psychopathology, broadly. Self-discrepancy theory will now be reviewed in greater depth.

Self-Discrepancy Theory. SDT was initially proposed by Higgins in 1983, and was developed for the purpose of understanding variability of emotional responses to the same or similar experiences across individuals (Higgins, 1985; Higgins, 1987; Van Lange, Kruglanski, & Higgins, 2012). Through observation, Higgins noted that while some individuals respond to an aversive situation with distinct feelings characteristic of depression, others respond with emotions more closely associated with anxiety. He proposed that though individuals may maintain the same goals, the representations of these goals vary across individuals. According to SDT, the standards that guide our self-regulation are called “self-guides” (Higgins, 1987). This

theory proposes two different self-guides: ideal self-guides, and ought self-guides. For example, imagine two distinct individuals who both maintain a goal of receiving above 90% on an examination. If person A is guided by hopes and aspirations, they are understood to have an “ideal self-guide”. In contrast, if person B is guided by a sense of duty or obligation, they are said to have an “ought self-guide” according to SDT.

When life events occur that are at odds with a person’s self-guide (e.g., a negative life event), SDT proposes that this event prompts an individual to reflect on their current self-concept in relation to their self-guide. When a discrepancy between one’s “actual” self-concept and self-guide is experienced (a self-discrepancy), negative emotions arise. Self-concept can be understood as one’s self-representation, based off of experiences with one’s environment and significant others. While self-concept is not a tangible entity, it can often be inferred from an individual’s response to situations, and is useful in predicting future behavior (Markus & Wurf, 1987). Self-concept is often understood to be structured, multifaceted, developmental, hierarchical, stable, differentiable and evaluative (Shavelson, Hubner, & Stanton, 1976). It is comprised of several self-representations (cognitive representation of the self), which differentially impact information processing and behavior depending on their importance to the self-concept. Self-representations can exist in relation to current experiences, past or expected future experiences, desired experiences, and so forth. Theorists have proposed that while some self-representations are central to the self-concept, others are peripheral, and do less to guide thoughts and actions (Markus & Wurf, 1987). Notably, while research on the structure of the self-concept and self-regulation are presumed to be directly related, they are “pursued in virtually non-overlapping literatures” (Markus & Wurf, 1987, p. 307), rendering extensive discussion regarding the structure of the self-concept out of the scope of this literature review.

Varying emotion experiences result when an individual experiences a discrepancy with their “ought” or “ideal” self-guide (Vohs & Baumeister, 2011). Specifically, failure to achieve approach-related goals (ideal self-guide) results in dejection related emotions such as disappointment and sadness, and failure to achieve avoidance-related goals (ought self-guide) is more closely associated with fear related emotions such as worry, and nervousness. Thus in the above example, if person A and person B both failed to meet their goal of achieving at least 90% on an examination, SDT would predict that person A would feel sad and disappointed while person B would feel nervous and worried. Higgins further proposed that larger discrepancies would be associated with more intense feelings of discomfort.

Based on experience, ideal or ought self-guides may be more accessible. What contributes to the accessibility of these self-guides? Researchers have explored the impact of parenting style on self-guide accessibility, and has found that the way in which parents respond to their child impacts the accessibility of self-guides (Van Lange et al., 2012). That is, if parents consistently respond in a way that highlights failures to achieve hopes and aspirations (e.g., “you didn’t achieve what you could have”), ideal self-guides become strong in that individual. In other words, parenting styles that emphasize the absence of positive outcomes in the presence of failure engender strong ideal self-guides. In contrast, if parents consistently respond in a manner that emphasized failures to fulfill duties and obligations (e.g., “you should have achieved that goal”), ought self-guides become stronger in that individual. In other words, critical parenting styles that highlight aversive consequences as a result of failures tend to engender strong ought self-guides. Over time, these self-guides, modeled by parents and others important to the individual, become internalized, and influence how the individual responds to their own failures to meet goals. While thus far we have discussed self-guides as they relate to the standpoint of the

individual, SDT also discusses self-guides from the vantage point of another individual. That is, while one may consider their own “ought” self-guides, they may also consider the self-guides of significant others in the face of an aversive event, which uniquely contributes to the emotional experience (Higgins, 1987; Higgins, Klein, & Strauman, 1985; Van Lange et al., 2012). For example, an individual may experience a substantial discrepancy between their actual self-concept and their perception of what a parent or spouse expects their self-concept to be. While often time’s “ought” self-guides are internalized based on social expectation, considering the expectations of significant others may allow for a more comprehensive view of the discrepancy between one’s actual self and “ought” self-guide.

Self-Discrepancy Theory and psychopathology. There have been several attempts to understand psychopathology through SDT. A study conducted by Higgins, Klein, and Strauman (1985) immediately followed the initial development of SDT. Noting that actual-ideal discrepancies were characterized by dejection-related emotions, and that actual-ought discrepancies were characterized by agitation and threat-related emotions, these researchers sought to understand how self-discrepancies mapped on to characteristics of depression and anxiety. Fifty-two students were subjects in this study, and were asked to complete the Selves Questionnaire (Higgins et al., 1985). This questionnaire (see chapter 2 for detailed information) was administered to assess for self-concept across domains (actual, ideal, ought) and across standpoint (self, other). Each domain of the self can be understood from one’s own standpoint (e.g., ideal: own), or the standpoint of another (e.g., ideal: other). The BDI, Blatt Depressive Experiences Questionnaire, Emotions Questionnaire (adapted from the Multiple Affect Adjective Check List) and Hopkins Symptom Checklist subscales were administered to assess for broad symptoms of depression and anxiety. Several findings were notable. Firstly, actual-ideal and

actual-ought discrepancies showed high correlation with one another. For example, actual: own – ought: own discrepancies were highly correlated with actual: own – ideal: own discrepancies ($r = .76, p < .001$), actual: own – ideal: other discrepancies ($r = .69, p < .001$) and actual: own – ought: other discrepancies ($r = .59, p < .001$). Secondly, when examining the correlation between actual- ideal discrepancies and symptoms of emotional functioning (pooled from own and other perspectives, partialling out pooled actual – ought discrepancies), this kind of discrepancy was associated with dejection-related emotions, as predicted by SDT. Third, when examining the correlation between actual- ought discrepancies and symptoms of emotional functioning (pooled from own and other perspectives, partialling out pooled actual – ideal discrepancies), this kind of discrepancy was associated with agitation and threat-related emotions, as predicted by SDT. While this study broadly investigated the relationship between self-discrepancies and symptoms of psychopathology, the study did not look at distinctive features of psychological disorders (Higgins et al., 1985). It is possible, therefore, that nuances that are more specific to a particular manifestation of anxiety (e.g., social anxiety, panic disorder) were not captured in the symptoms that were investigated.

A study that followed aimed to address this issue by examining the association between self-discrepancies with specific disorders: social anxiety and dysthymia. This study, by Weilage and Hope (1999) hypothesized that actual: own – ideal: own discrepancies would be associated with depressive symptoms, and that actual: own – ought: other discrepancies would be associated with social anxiety symptoms. This study was largely a replication of a similar study conducted by Strauman, which demonstrated that individuals with social phobia exhibited large discrepancies between actual: own - ought-other domains, and those with depression exhibited large discrepancies between actual: own – ideal: own domains (Strauman, 1989). The study

sought to extend findings by exploring how discrepancies related to comorbid disorders. Findings demonstrated that individuals with comorbid social phobia and depression had greater actual: own – ideal: own discrepancies than individuals with only a diagnosis of social phobia or normal controls. Interestingly, individuals with dysthymia alone did not exhibit larger actual: own – ideal: own discrepancies than normal controls. Findings also revealed that individuals with social phobia, as well as those with comorbid social phobia and depression exhibited larger discrepancies across actual: own – ought: other domains than normal controls. Notably, individuals with a diagnosis of dysthymia alone also exhibited larger discrepancies across these domains. While these studies examined discrepancies across specific manifestations of psychopathology, some domains and standpoints were not included in their analyses. For example, actual: own – ideal: other domains were not investigated as they pertain to dysthymia, potentially missing valuable data regarding the self-regulatory processes contributing to this disorder.

A study by Scott and O'Hara examined depressive and anxiety disorders as they relate to different forms of self-discrepancy. This study looked at clinically depressed students (meeting criteria for dysthymia or a major depressive episode), clinically anxious students (meeting criteria for GAD, social phobia, panic attacks, agoraphobia, or obsessive-compulsive disorder), a group of students meeting criteria for comorbid depression and anxiety, and a normal control group. The DSM –Third Edition Revised was utilized in formulating diagnoses. The Selves Questionnaire was used in the assessment of self-discrepancies, and actual: own, ideal: own, and ought: other domains were assessed. Findings demonstrated support for the hypothesis that clinically depressed individuals (either singular or comorbid diagnoses) would exhibit larger actual: own – ideal: own discrepancies than individuals with an anxiety disorder or normal

controls. Findings also supported the hypothesis that those with anxiety disorders (either singular or comorbid diagnoses) would exhibit larger actual: own – ought: other discrepancies than individuals with depressive disorders or normal controls. While this study explored a heterogeneous clinical sample, the study did not aid in the understanding of processes underlying comorbid disorders. That is, while the study demonstrated that individuals with comorbid anxiety and depression exhibit increased discrepancies across both actual: own – ideal: own, and actual: own – ought: other domains, little information was revealed regarding the nature of these comorbidities (which comorbidities were characterized by which discrepancies), thereby overlooking important transdiagnostic self-regulatory processes underlying comorbid disorders. Once again, important other domains were not investigated (e.g., ought: own, ideal: other), which may play a critical role across psychopathologies (Scott & O'Hara, 1993).

A more recent and sophisticated study examining the relationship between self-discrepancies and specific emotions used structural equation modeling and developed more comprehensive latent variables to capture self-discrepancies (Phillips & Silvia, 2010). Notably, the latent variable “Self-Discrepancy” was established by use of a modified Selves Questionnaire, a visual analogue scale of global self-discrepancy, and an adjectives rating scale. Furthermore, this study evaluated only the standpoint of the self, and did not include the perception of others across domains. This study examined how discrepancies predicted scores across measures of depressive and anxious affect (Depression and Anxiety Stress Scale; DASS and the Mood and Anxiety Symptom Questionnaire; MASQ). Findings demonstrated that symptoms of depression were associated with both actual: own – ideal: own and actual: own – ought: own discrepancies. In contrast, symptoms of anxiety were distinctly associated with actual: own – ought: own discrepancies.

As is evidenced by the highlighted findings, there have been several attempts to understand the relationship between self-discrepancies and psychopathology. Notably, however, across studies there has been a high degree of variability in how discrepancies have been defined (e.g., domains and standpoints assessed), measures used, and statistical methods implemented. Regardless, there is clear interest within the scientific community to further the understanding of how self-discrepancies impact psychological well-being. Furthermore, it appears that across studies, a general consensus exists that various types of discrepancies relate to different kinds of emotional experiences. Recently, transdiagnostic and self-discrepancy research have merged, further advancing our understanding of the relationship between psychopathology and self-discrepancies.

SDT and the tripartite model of emotional distress. In a study conducted by Bruch and colleagues (2000), SDT was investigated in conjunction with the tripartite model of emotional distress. This study hypothesized that actual: own – ideal: own discrepancies would relate to depressive components of the tripartite model (anhedonia), and actual: own – ought: other discrepancies would relate to anxiety specific components of the tripartite model (physiological hyperarousal). It was further hypothesized that the general distress component of the tripartite model would have a stronger relationship with actual: own – ideal: own discrepancies (Bruch et al., 2000). Findings demonstrated that, as hypothesized, actual : own – ideal : own discrepancies (controlling for actual: own – ought: other discrepancies) were significantly correlated with both general indicators of distress ($r = .38, p < .001$) as well as symptoms specific to the depressive component of the tripartite model ($r = .22, p < .03$). In contrast, actual: own – ought: other discrepancies (controlling for actual: own- ideal: own discrepancies) were not significantly associated with specific features of anxiety ($r = .04$), which is contrary to what would be

predicted by SDT. Unexpectedly, this form of discrepancy showed a significant relationship with specific features of depression ($r = .24$), which is contrary to previous findings, as well as what would be predicted by SDT. While it is unclear as to why the latter two findings were observed, it should be noted that the “ought” domain was only evaluated from the standpoint of a significant other and not of the self. Lack of evaluation of the actual: own - ought: own discrepancy might have impacted the observed relationship between the evaluated “ought” discrepancy and features of the tripartite model. Specifically, SDT does not purport any claims with regard to how the actual: own – ought: other discrepancy should relate to emotions in isolation, as it is unclear as to whether the “ought” discrepancy from the standpoint of a significant other has been internalized by the subject.

It appears that the varying emotions produced as a result of self-discrepancies cannot be fully captured by use of the tripartite model. Specifically, it appears that actual: own – ought: other discrepancies do not produce symptoms specifically related with physiological hyperarousal. These findings underscore the notion that, with regard to self-discrepancies, physiological hyperarousal does not appear to be a distinctive feature of the emotional response elicited by actual-ought discrepancies. While the tripartite model for understanding psychological disorders does not appear to be the optimal way to understand self-discrepancies, few other studies have examined SDT as it relates to the transdiagnostic approach to psychopathology. Given the high degree of support that exists for organizing psychopathologies based on the fear- and distress- based disorder taxonomy of psychopathology, investigating SDT as it related to this transdiagnostic taxonomy (rather than the tripartite model) may aid in elucidating some of the self-regulatory processes underlying these clusters of disorders.

While examining self-discrepancy in the context of the fear- and distress-based disorder

taxonomy will further our understanding of how discrepancies contribute to multifinality of emotional disorders, identifying individual differences that might impact this relationship is also of interest. Investigating both proximal factors and moderating variables will foster the development of a transdiagnostic model that addresses both multifinality and divergent trajectories. Behavioral inhibition and approach systems relate to dispositional differences in approach and avoidance motivation and will be explored as moderators of interest in the context of the current study.

BIS/BAS as Potential Moderating Variables.

In order to establish a transdiagnostic model with the capacity to explain both multifinality as well as divergent trajectories, individual differences that moderate the relationship between discrepancy and symptom severity must be incorporated into the model. A dispositional individual difference that has been studied widely in the context of emotional disorders and the transdiagnostic approach is behavioral approach and behavioral inhibition systems.

The behavioral approach system (BAS) and behavioral inhibition system (BIS) were proposed by Gray to conceptualize and measure sensitivity to reward and punishment, respectively (Bijttebier, Beck, Claes, & Vandereycken, 2009; Gray, 1982). The theory pertaining to the sensitivity of these motivation systems has been labeled the Reinforcement Sensitivity Theory (RST). These systems represent motivational systems that influence behavioral tendencies based on outcome. Individuals with high levels of BAS tend to be more sensitive reward, and in turn have a greater tendency to engage in approach related behaviors. Conversely, individuals with high levels of BIS tend to be more sensitive to punishment, and therefore have a greater tendency to engage in avoidance/inhibition related behaviors. The measure typically used

to assess these constructs (BIS/BAS scale; Carver & White, 1994) looks at dispositional levels of BIS and BAS. In the context of the current study, BIS and BAS are present as exploratory moderating variables due to their relationship with various psychopathologies and their theoretical relevance within the context of self-discrepancy.

The association between BIS/BAS and various forms of psychopathology have been empirically demonstrated. According to RST, individuals who experience extremes on BIS and BAS dimensions have a higher likelihood of developing psychopathology. Different manifestations of psychopathology can often be observed depending on where individuals fall on these dimensions (Bijttebier et al., 2009). Research has consistently demonstrated, for example, that individuals who endorse depressive symptoms tend also to report lower BAS (Bijttebier et al., 2009; Kasch, Rottenberg, Arnow, & Gotlib, 2002). Additionally, high levels of BIS and low BAS has been demonstrated to have significant indirect effects on social anxiety by way of cognitive biases (Kimbrel, Nelson-Gray, & Mitchell, 2012). In contrast, elevated BIS has been associated with a slew of anxiety disorders, including social anxiety disorder, panic disorder, and generalized anxiety disorder (Johnson, Turner, & Iwata, 2003). The relevance of these dimensions to personality development and temperament render them important transdiagnostic constructs, as elevations and extremes on these dimensions cross cut multiple disorders simultaneously.

As discrepancy between ideal and actual self-concept is related to a desire to approach a rewarding state, and discrepancy between ought and actual self-concept is related to a desired to avoid an aversive end-state, it may be the case that individual differences in behavioral motivation tendencies may differentially influence the impact of cognitive processes related to self-discrepancy on emotion-related outcomes. In addition to the theoretical relationship between

constructs, BIS and BAS are commonly examined within transdiagnostic research to assess for individual differences in behavioral tendencies and reward sensitivity (Brown & Barlow, 2009; Degnan & Fox, 2007; Leen-Feldner, Zvolensky, Feldner, & Lejuez, 2004). BIS and BAS have also been examined as moderators in the context of emotion-focused research (Ravaja, 2004; Windsor, Anstey, Butterworth, & Rodgers, 2008). In the context of the current study, BIS/BAS scales are highly useful in that they have both been widely used in transdiagnostic research, have been used to evaluate for moderation in the context of emotion-focused research, and can contribute to developing a transdiagnostic model capable of addressing both multifinality and divergent trajectories. The use of this measure will allow for an effective assessment of how individual differences in behavioral motivation tendencies influence the relationship between self-discrepancy and internalizing disorders, while allowing for the current study to be understood in the context of pre-existing transdiagnostic studies.

Current Study

Purpose. The current study aims to investigate congruence between SDT and the fear- and distress-based disorder taxonomy of psychological disorders. While the scientific community has exhibited clear interest in understanding how SDT relates to various psychopathologies, past studies lack consistency in findings and methods, and have yet to fully capture self-discrepancies within a transdiagnostic model. As a means of working towards a parsimonious understanding of how SDT relates to psychopathology, the current study aims to investigate how actual – ideal and actual-ought discrepancies broadly relate to the fear- and distress-based disorders, with distress-based disorders being indicated by generalized anxiety disorder and depression (exclusion of dysthymia elaborated in procedures), and fear-based disorders being indicated by panic disorder, social anxiety disorder, and agoraphobia. Gaining a

more thorough sense of which psychopathologies are characterized by specific self-discrepancies may guide researchers towards understanding the underlying transdiagnostic self-regulation processes contributing to these disorders. Furthermore, examining these models within two populations will further enhance generalizability of the findings. While attempts have been made to understand self-discrepancies using the tripartite model of emotional distress, the model was unable to fully account for all aspects of SDT. While this does not negate the utility of this model, it may be the case that this self-regulatory process in particular is related to psychopathology in a way that is not captured by this model. Understanding how SDT relates to various forms of psychopathology can provide further insight as to the underlying self-regulatory processes occurring across internalizing disorders.

By examining actual-ideal and actual-ought discrepancies (pooled across own and other standpoints), as they relate to fear- and distress-based disorders, we may gain a more comprehensive understanding of what kind of discrepancies are most detrimental across internalizing disorders. This study also aims to include moderating variables that evaluate for behavioral motivation tendencies. As BIS and BAS have been widely researched as transdiagnostic factors associated with psychopathology, the inclusion of BIS/BAS scales lends themselves to understanding self-discrepancy in relation to other well-established transdiagnostic factors. By understanding how BIS and BAS moderate the relationship between self-discrepancies and emotional disorders, we may begin to understand the divergent trajectories associated with self-discrepancy as a transdiagnostic process.

By examining this self-regulatory process across fear- and distress-based disorders, and including moderating factors that may impact symptom severity, the proposed study will investigate a transdiagnostic model using proximal risk factors (self-discrepancies) and

moderators (BIS/BAS) to account for both multifinality as well as divergent trajectories as they relate to processes associated with self-regulation.

Findings from the study may serve the field of clinical psychology in several ways. Not only would these findings contribute to the wealth of research aimed at understanding how self-discrepancies impact emotional well-being, this study may provide further insight with regard to treatment goals across internalizing disorders. While several modes of intervention are geared towards understanding underlying conflicts and decreasing intrapersonal discrepancies (e.g. psychoanalytic, humanistic, acceptance and commitment therapy), further understanding these underlying processes across disorders may narrow treatment targets and further enhance efficacy of treatment. In addition, the identification of psychological processes that underlie fear- and distress-based disorders may enhance our understanding of the processes that differentiate these clusters, giving further credence and utility to the taxonomies.

Hypotheses. The current study will test the following hypotheses:

- H1. Actual – ideal discrepancies (pooled across own and other standpoints) will predict symptom severity across distress-based disorders above and beyond actual-ought discrepancies.
- H2. Actual- ought discrepancies (pooled across own and other standpoints) will predict symptom severity across fear-based disorders above and beyond actual-ideal discrepancies.
- H3. BAS sensitivity will moderate the relationships between actual-ideal discrepancy and symptom severity of distress-based disorders. It is predicted that as BAS increases, the relationship between actual-ideal discrepancy and symptom severity of distress-based disorders will strengthen.
- H4. BIS sensitivity will moderate the relationship between actual-ought discrepancy and symptom severity across fear-based disorders. It is predicted that as BIS increases, the

relationship between actual-ought discrepancy and symptom severity of fear-based disorder will strengthen.

H5. No group differences in structural paths will be observed between MTurk and SONA groups given the theoretical basis for the research question. While demographics may significantly vary between groups, the nature of the relationship between self-discrepancy and symptom severity are not expected to differ significantly.

Chapter 2

Methods

Participants

In order to ensure high data quality, as well as diversity within the sample, data was obtained from both a national online community sample as well as a university sample. For further information regarding Amazon's Mechanical Turk (MTurk) and the Idaho State University research participation system (SONA), refer to Appendix I. The purpose of using an online community data collection method was to obtain a sample that was largely representative of the North American adult population, enhancing generalizability of findings. While it is often the case that data collection occurs within college samples, engaging in online data collection, and specifically data collection using Amazon's Mechanical Turk (MTurk) allowed for data collection of a more diverse nature with regard to age, gender, race, socio-economic status, and geography (Casler, Bickel, & Hackett, 2013). The inclusion of a university sample served to circumvent unforeseeable errors in online community data collection such as incomplete forms, thereby ensuring high quality data collection. In addition, several past studies on self-discrepancies as they relate to psychopathology have been conducted using university samples (Bruch et al., 2000; Scott & O'Hara, 1993; Strauman & Higgins, 1988). Literature thereby supported obtaining significant findings in the university sample, with the inclusion of an online community sample serving to enhance ecological validity and generalizability of findings, should they be observed. It should be noted that significant differences in measurement and structural equation models between samples were not expected based on research findings suggesting that while MTurk samples are more demographically diverse than university samples, results related to psychological research questions do not differ between these samples (Casler et al., 2013).

Participants provided informed consent prior to participating and were informed that they would receive either financial compensation or research credit for their participation, depending on sample. Based on the nature of the online study, developed on the Qualtrics platform, there were no instances of missing data due to participants being required to complete each section before moving on to the next. Validity checks placed within the study in the form of directive questions embedded within questionnaires (e.g. “select option 4”) were failed by 18 MTurk participants, and 29 SONA participants, and therefore these participants’ data were not used during analyses. This resulted in a sample size of 353 participants.

Across both samples (Total N = 353), participants were 109 male (30.90%), 242 female (68.80%), and 2 “other” gendered (0.60%) adults, ranging between the ages of 18 to 65 ($M = 30.54$, $SD = 11.27$). While the preponderance of SONA participants fell in the 18-24 year age range (37%, $n = 131$), the MTurk sample demonstrated more age variability, with most participants identifying between the ages of 25 and 34 (20%, $n = 71$). Across samples, approximately 91% of participants identified as “non-Hispanic or Latino” (MTurk 47.31%, $n = 167$, SONA 43.34%, $n = 153$), and 82.4% of the sample identified as White/Caucasian (MTurk 41.36%, $n = 146$, SONA 41.10%, $n = 145$). Further, and more detailed demographic information for each sample (e.g. income, education, relationship status) can be found in Table 1. Differences between samples will be evaluated during analyses of descriptive statistics.

Table 1
Demographic frequencies

Variable (as coded)	n MTurk	n SONA	N Total	Percent total (%)
Gender				
Male (1)	74	35	109	30.90
Female (2)	106	136	242	68.80
Transgendered (3)	0	0	0	0.00
Other (4)	2	0	2	0.60
Age				
18-24 (1)	22	131	153	43.30
25-34 (2)	71	27	98	27.80
35-44 (3)	48	9	57	16.10
45-54 (4)	25	3	28	7.90
55-64 (5)	11	1	12	3.40
65+ (6)	5	0	5	1.40
Ethnicity				
Hispanic or Latino (1)	15	18	33	9.30
Not Hispanic or Latino (2)	167	153	320	90.70
Race				
American Indian/Alaska Native (1)	2	1	3	0.80
Asian (2)	11	2	13	3.70
Black/ African American (3)	11	1	12	3.40
Native Hawaiian/ Other Pacific Islander (4)	0	0	0	0.00
White/ Caucasian (5)	146	145	291	82.40
More than 1 race (6)	10	12	22	6.20
Other (7)	2	10	12	3.40
Income				
Less than \$25,000 (1)	42	78	120	34.00
\$25,000 to \$34,000 (2)	33	29	62	17.60
\$35,000 to \$49,999 (3)	26	15	41	11.60
\$50,000 to \$74,999 (4)	45	24	69	19.50
\$75,000 to \$99,999 (5)	21	8	29	8.20
\$100,000 or more (6)	15	17	32	9.10
Education				
Some high school (1)	2	1	3	0.80
High school graduate (2)	19	19	38	10.80
Some college (3)	36	113	149	42.20
Associate degree (4)	25	22	47	13.30
Professional degree (5)	15	0	15	4.20
Undergraduate degree (6)	65	14	79	22.40
Graduate Degree (7)	20	2	22	6.20
Relationship status				
Single (1)	48	61	109	30.90
Committed relationship (2)	42	62	104	29.50
Married (3)	75	40	115	32.60
Divorced (4)	11	7	18	5.10
Separated (5)	3	1	4	1.10
Widowed (6)	3	0	3	0.80

Note. N Total = 353 (n MTurk= 182, n SONA = 171). Percentages rounded to the nearest tenth.

Procedures

Data collection began following the approval of the Human Subjects Committee. Using the Qualtrics online survey platform, MTurk and SONA participants were presented with study information and were given the opportunity to provide informed consent for participation. During the consenting procedure, participants were informed of the uses of their data, compensation (financial or class credit), and risks of the study, including potential emotional distress caused by sensitive questions about psychological well-being. Furthermore, participants indicated their voluntary desire to participate in the study, and were instructed not to participate in the study should they feel uncomfortable disclosing sensitive information. The online surveys were programmed so that each item of a measure required an answer prior to moving on to the subsequent survey. This was made clear to participants during consent. Privacy policies were outlined, and participants were instructed to not disclose personal information including their real names, addresses, and contact information. Participants were presented with the contact information of the principal investigator and the Human Subjects Committee at ISU.

Following consent, individuals were presented with the Selves Questionnaire (Higgins et al., 1985). While this measure was initially developed for paper-pencil administration, several studies have successfully utilized computer adaptations of the measure (Higgins, Shah, & Friedman, 1997; Shah, Higgins, & Friedman, 1998; Shah & Higgins, 2001). Domains of the self were defined, and standpoints were made clear during administration so that participants were aware of which domain was being assessed (actual, ideal, ought) and from which standpoint (own, other). As this measure is idiographic in nature, individuals were prompted to list six attributes per domain: standpoint combination (excluding the actual: other domain, which has not typically been assessed in previous studies that have examined SDT). The actual domain was

assessed first, followed by the ideal: own and ideal: other domains. This was followed by the assessment of the ought: own and ought: other domains. The Selves Questionnaire was administered prior to symptom severity measures so as to ensure that priming effects from symptom severity measures did not skew attributes identified on the Selves Questionnaire. Scoring of self-discrepancies is outlined in more detail in the discussion on measures.

These measures of discrepancy were followed by measures of symptom severity across fear- and distress-based disorders (see Measures section). Symptom severity measures were counterbalanced, so as to control for order effects. Brief measures of depression, generalized anxiety disorder, agoraphobia, panic disorder and social anxiety disorder were administered. Depression, dysthymia and generalized anxiety disorder have consistently been demonstrated to be indicators of distress-based disorders, however due to the lack of self-report measures assessing specifically for dysthymia, and due to symptom overlap between depression and dysthymia, only depression and generalized anxiety disorder were used as indicators of distress-based disorders in this study. Social anxiety disorder, panic disorder and agoraphobia were used as indicators of fear-based disorders (Krueger & Markon, 2006; Slade & Watson, 2006; Watson, 2005). Measures of psychopathology were followed by the collection of demographic information. Age, gender, race, ethnicity, annual household income, education, and relationship status were assessed.

Throughout the administration of the online surveys, valid responding was assessed by the inclusion of data quality checks. Research by Mason and Suri (2011) found that the inclusion of a “captcha” question with a verifiable answer that must be entered by the participant greatly increased data quality and reduced invalid responses (Mason & Suri, 2012). The inclusion of such a question ensured that the survey was not being completed by a computer. In order to

further ensure that participants were attending to the content of survey questions, each symptom severity measure included an item that directed the participant on how to answer the item (e.g., “select answer number 1”). This item was included as a data quality check, ensuring that participants were responding based on the content of the items and not at random.

As it was anticipated that the survey, in its totality, would be completed within 60 minutes, MTurk participants were provided 1 dollar for completion of the study (Raines, Allan, Oglesby, Short, & Schmidt, 2015). In contrast, undergraduate participants were assigned 1 credit for 30 minutes of research participation (as per typical SONA protocol).

Measures

The Selves Questionnaire. The Selves Questionnaire (see Appendix A), developed by Higgins and colleagues (1985) has been the primary measure used for assessing self-concept discrepancies. As individuals are typically asked to list “up to 10” attributes when completing this measure, individuals were asked to list six attributes associated with different domains of the self-concept, so as to capture a range of self-representations within the self-concept and to keep the number of attributes consistent across participants. Identifying a specific number of attributes has been done in previous studies, and as few as three per domain have been used in previous studies (Brockner, Paruchuri, Idson, & Higgins, 2002; Haws, Dholakia, & Bearden, 2010).

First, participants were asked to list six attributes that they felt they actually possessed. Next, they were asked to list six attributes they felt they would ideally like to possess, and six attributes they felt a significant other would like them to ideally possess. Next, participants were asked to complete the same procedure across the “ought” domain. That is, they were asked to identify six attributes they “ought” to possess, and identify six attributes a significant other felt they “ought” to possess. Instructions indicated that the “other” being considered must be

important to the individual – someone whose opinion mattered. All discrepancy scores were developed using the actual: own domain as a point of comparison.

Scoring of this measure was completed by comparing attributes listed across self-concept domains. When attributes across domains were the same or synonymous with one another, they were considered to be a “match”. In contrast, when attributes across domains were opposite or antonymous of one another, this would be considered a “mismatch”. As in previous studies, synonyms and antonyms were operationally defined in terms of a computerized thesaurus (Bruch et al., 2000). The current study utilized Thesaurus.com, which has established its database using Roget’s 21st Century Thesaurus. Discrepancy scores, as operationalized by Higgins, were determined by subtracting number of “matches” from number of “mismatches”. For example, when an individual identified the attribute of “outgoing” in their actual: own domain, and “extraverted” in their ideal: own domain, this would be considered a match. However, when they identified the attribute “reserved” in their ideal: own domain, this would be considered a mismatch. Highest levels of discrepancies would be identified by a score of +6 (6 mismatches minus 0 matches), whereas greatest congruence would be indicated by a score of -6 (0 mismatches minus 6 matches). Attributes neither antonymous nor synonymous with those listed in the actual: own domain were considered neither a match nor a mismatch, and were omitted from the development of the discrepancy score, as is typical for this measure.

As mentioned previously, all domain: standpoint combinations were contrasted with the actual: own domain in the development of discrepancy scores. This resulted in four overall discrepancies: actual: own – ideal: own, actual: own – ideal: other, actual: own – ought: own, and actual: own – ought: other. In order to pool actual-ideal and actual-ought discrepancies across standpoints, discrepancy scores were summed to represent two distinct overall-

discrepancy scores (actual-ideal, actual-ought), which were used in the prediction of symptom severity across fear- and distress-based disorders (Higgins et al., 1985). Therefore, greatest discrepancy across domains *and* standpoints would be indicated by a score of +12, and greatest congruency would be indicated by a score of -12. While pooling discrepancy scores across standpoints is consistent with standard protocol, visual inspection of the data was also completed to ensure adequate justification for pooling discrepancy scores. Visual inspection revealed consistency between discrepancy scores across standpoints in both evaluated domains. Discrepancy scores across own and other standpoints for the ideal domain were significantly correlated at $p < .01$ ($r = 0.46$). Similarly, scores across standpoints for the ought domain were significant correlated at $p < .01$ ($r = 0.54$). Significant correlations justified the pooling of discrepancy scores across standpoints for both the ideal and ought domains.

In past studies, the Selves Questionnaire has shown strong psychometric properties for evaluating overall self-discrepancies. In a study by Scott and O'Hara (1993), the measure was demonstrated to have strong test-retest reliability ($r = .60, p < .001$). This measure has also shown strong interrater reliability when scored by independent raters using computerized thesauruses ($r = .92, p < .001$; Scott & O'Hara, 1993). In the current study, this measure was scored by two independent raters using a computerized thesaurus. Reliability in scoring was established by ensuring that both raters obtained the same discrepancy score for 5 individual participants. Upon reliability being established, scores were then checked at random intervals (approximately every 20 participants) to ensure sustained reliability of raters. At these intervals, discrepancy scores determined by independent raters were within 1 point of each other at most.

Center for Epidemiological Studies Depression Scale (CES-D Scale). The Center for Epidemiological Studies Depression Scale (CES-D Scale; see Appendix B) is a self-report

measure developed by Radloff (1977) used in screening for depressive symptomology within the general population (Radloff, 1977). Items within this scale were derived from previously validated depression scales. Components assessed by this measure include depressed mood, feelings of guilt, worthlessness, helplessness, hopelessness, psychomotor retardation, sleep disturbance and loss of appetite. The measure was largely selected due to the fact that it does not address the tendency for self-harm or suicide ideation. High endorsement of self-harm and suicide related items would require immediate follow-up with research participants, and this was not possible given the data collection methods of the study. The scale consists of 20 items, and possible responses fall along a 4-point scale (0 = rarely or none of the time, less than 1 day; 4 = most or all of time, 5-7 days).

Individuals were asked to reflect on their previous week, and use this time frame to guide their responses. This scale includes items that require backwards scoring so as to capture and challenge response-set tendencies, such as the tendency to always highly endorse items. This scale has been demonstrated to show high internal consistency in the general population using the split-halves method ($r = 0.85$). Furthermore, it has been shown to have acceptable test-retest stability, as well as good concurrent validity by clinical and self-report criteria. Evidence exists to support construct validity of the measure. Furthermore, this measure maintains these psychometrics properties across demographic variables including race, socioeconomic status, and age (Crockett, Randall, Shen, Russell, & Driscoll, 2005; Roberts, 1980) making it a useful measure to assess depressive symptoms for the purpose of the proposed study. Cronbach's alpha for the measure in the current study was $\alpha = 0.92$.

Generalized Anxiety Disorder Screener (GAD-7). The Generalized Anxiety Disorder Screener (GAD-7; see Appendix C) is a measures used to assess for the presence of GAD

symptomology. This is a 7-item measure, and respondents were asked to reflect on the past two weeks, using their experiences within this time frame as a basis for their answers. Responses were based on a 4-point Likert scale, with a score of zero being associated with the anchor “not at all”, and 3 being associated with an anchor of “nearly everyday” (Löwe et al., 2008). Items within this measure assess the 7 core symptoms of generalized anxiety disorder. This measure has demonstrated acceptable internal consistence ($\alpha = 0.92$), and acceptable test-retest reliability ($r = 0.83$; Spitzer, Kroenke, Williams, & Lo, 2006). Furthermore, when investigating the unidimensionality of the measure, items were found to be indicators of a single factor. Age and gender invariance of the GAD-7 factor structure has also been established, indicating that the measure assessed a single factor regardless of these demographic variables. Construct validity of this measure has also been established, as scores on this measure have been significantly correlated with established risk factors for the disorder such as age, gender, education level, and so forth. Convergent validity of this measure has also been demonstrated, as scores on the GAD-7 showed a strong positive correlation with both the Beck Anxiety Inventory ($r = 0.72$) and the anxiety subscale of the Symptom Checklist – 90 ($r = 0.74$; Spitzer et al., 2006). It should be noted that as internalizing disorders tend to be highly correlated, elevations on the GAD-7 are also positively associated with the presence of other anxiety disorder such as panic disorder, social anxiety, and posttraumatic stress disorder. Though developed using a primary care patient sample, this measure has demonstrated reliability and validity in the general population (Löwe et al., 2008). Psychometric properties of the measure have been examined within this population, and the measure has demonstrated good internal consistency ($\alpha = 0.89$). Construct validity was examined by looking at the correlation between GAD-7 scores and other psychological measures such as the Patient Health Questionnaire, two-item measure (PHQ-2). Findings demonstrated

similar degrees of correlation relative to other measures of anxiety (e.g., PHQ-2, $r = .64$). The brevity of the measure along with its psychometric properties in both clinical and non-clinical samples rendered it appropriate for the current study. Cronbach's alpha for the measure in the current study was $\alpha = 0.91$.

Panic Disorder Severity Scale (PDSS). The Panic Disorder Severity Scale (PDSS; see Appendix D), developed by Shear and colleagues (1997), was initially developed as a scripted interview to assess for symptom severity of panic symptoms in a clinical population (Shear et al., 1997). This seven item measure assessed several facets of panic disorder, including frequency of attacks, distress during attacks, anticipatory anxiety, agoraphobic fear and avoidance, body sensation fear and avoidance, and social and occupational impairment (Shear et al., 1997). In this format, the measure displayed high interrater reliability ($r = .87, p < .001$) and moderate internal consistency ($\alpha = 0.65$). Furthermore, convergent and discriminant validity of this measure were also demonstrated by investigating the correlation between each item of the PDSS in relation to questions on the Anxiety Disorder Interview Schedule (ADIS), as well as other questionnaires. Results indicated that highest correlations were observed between the PDSS and ADIS. For example, questions on the ADIS regarding fear of panic attacks was highly correlated with the PDSS item investigating anticipatory anxiety ($r = .78, p < .05$), and questions on the ADIS regarding sensation avoidance was highly correlated with PDSS item measuring interoceptive fear and avoidance ($r = .68, p < .05$). Recently, this measure has been used as a self-report questionnaire to assess for symptom severity of panic disorder, and this measure has been used in both clinical and non-clinical populations. In self-report form, this measure has also demonstrated good reliability and validity. In this modality, this seven-item measure is scored on a five-point ordinal scale (0 – 4, mild to severe). The measure inquires about symptoms of panic

over the past week. Notably, this measure allowed for participants to endorse subclinical levels of panic, avoidance, and so forth, ensuring that variability is maintained in use with non-clinical and sub-clinical samples (Houck, Spiegel, Shear, & Rucci, 2002). Notably, this measure has been administered using MTurk samples, and has demonstrated a high degree of internal consistency ($\alpha = 0.94$) when administered in this format (Raines et al., 2015). This measure has also been used in past studies as an indicator of fear-based disorders, making it ideal for the current study (Raines et al., 2015). Cronbach's alpha for the measure in the current study was $\alpha = 0.91$.

Agoraphobic Cognitions Questionnaire (ACQ). The Agoraphobic Cognitions Questionnaire (ACQ) is a 15-item measure that assesses for severity of agoraphobic cognitions (see Appendix E). While 14 of these items inquired about specific cognitions typical in agoraphobia, the last item is sometimes used as an open ended question and was not administered in the current study. Each item was rated on a five-point ordinal scale (1 = thought never occurs, 5 = thought always occurs), and assessed for two distinct facets of agoraphobic cognitions: loss of control and physical concerns (Chambless, Caputo, Bright, & Gallagher, 1984). Total scores are calculated by developing a mean score. This measure has been demonstrated to show high internal consistency ($\alpha = 0.80$) and test-retest reliability ($r = .79$, p -value not reported). Validity analysis further indicates that this measure has both convergent and discriminant validity. The ACQ demonstrated a significant correlation with the Avoidance Alone Mobility Inventory (AAL), another measure of agoraphobic symptoms ($r = .37$, $p < .001$) and the Body Sensations Questionnaire (assessing for sensitivity to autonomic arousal, $r = .67$, $p < .001$; Chambless et al., 1984). While this measure has typically been used on a clinical sample, literature suggests that adequate variability can also be observed in a community based sample,

when administered with 14 items (open ended question excluded). In a study by Bibb (1988), the ACQ was administered in a community sample. Mean scores on the overall measure were 1.6, with a standard deviation of .46 ($N = 139$). In contrast, those with a diagnosis of agoraphobia with panic attacks displayed a mean of 2.43, with a standard deviation of .63 ($N = 253$; Bibb, 1988). The psychometric adequacy of the measure, along with its capacity to capture variability in both clinical and non-clinical samples (14-item format) renders it appropriate for the current study. Cronbach's alpha for the measure in the current study was $\alpha = 0.88$.

Social Phobia Inventory (SPIN). The Social Phobia Inventory (SPIN) is a measure used to assess symptoms of social anxiety disorder (Connor et al., 2000). This measure consisted of 17 items assessing the extent to which the respondent has experienced symptoms of social anxiety over the past 7 days. The scale is a 5-point Likert scale (0 = not at all, 4 = extremely). The measure assessed various components of social anxiety disorder including fear, avoidance, and physiological arousal as they pertain to social situations (see Appendix F). Symptom severity was assessed by summing scores across items, resulting in a total score. This measure has been demonstrated to show adequate test-retest reliability ($r = 0.86$). Furthermore, internal consistency has also been demonstrated within this measure ($\alpha = 0.95$). Convergent validity of the measure has been demonstrated by high correlations with well-established measures of social anxiety, including the Social Interaction Anxiety Scale (SIAS, $r = 0.60$), and the Social Phobia Scale (SPS, $r = 0.60$). Discriminant validity was also found when correlating the SPIN with unrelated measures such as the Depression Anxiety Stress Scale – 21-item version (DASS-21, depression subscale $r = -0.03$, anxiety subscale $r = -0.03$, stress subscale $r = 0.10$). Taken together, the psychometric properties of the SPIN render it a useful and sound assessment tool. This measure has also demonstrated validity and reliability in community samples. One study examining the

psychometric properties of the measure in an adolescent community sample found high internal consistency ($\alpha = 0.92$), and adequate test-retest reliability across fear, avoidance, and physiological anxiety subscales ($r = .80$, $r = .88$, $r = .67$ respectively, $p < .01$). Furthermore the measure demonstrated good construct validity in the adolescent community sample with regard to consistency with the Anxiety Disorder Interview Schedule, fourth edition (ADIS-IV; Johnson, Inderbitzen-Nolan, & Anderson, 2006). Taken together, this psychometric data demonstrated utility of this measure in both a clinical and non-clinical sample. Cronbach's alpha for the measure in the current study was $\alpha = 0.94$.

Carver & White BIS/BAS scales. This measure of behavioral inhibition system (BIS) sensitivity and behavioral activation system (BAS) sensitivity stems from Gray's two-dimensional theory of personality. This measure was included in the current study for the propose of conducting exploratory moderation analysis. The measure, developed by Carver and White (1994), assesses individual differences in sensitivity to reward and punishment (see Appendix G). With regard to the assessment of BAS sensitivity, 3 different facets of BAS are evaluated: reward responsiveness, drive, and fun-seeking. Factor analysis during the development of the scale further confirmed the distinctness of these factors. Notably, these factors are correlated with one another. In past studies, the correlation between drive and reward responsiveness was $r = 0.34$, and the correlation between drive and fun-seeking was $r = 0.41$. The correlation between reward responsiveness and fun-seeking was $r = 0.36$ (Carver & White, 1994). All three scales were found to load strongly on the second-order BAS factor, with all scales loading above .75 in the unrotated factor matrix. In the current study, only the total BAS score will be used during moderation analysis, as this moderator is being investigated in an exploratory manner, and there is no theoretical or empirical basis for looking as specific

components within the higher-order BAS factor as of yet. Furthermore, as is presented below, all three components of BAS hang together with regard to how they correlate with other constructs (e.g. positive affect, negative temperament, etc.), therefore there is no basis to hypothesize that one component of BAS may be a more effective moderator over the others.

Items assessing BIS have been shown to load strongly on to the second-order BIS factor. Convergent and discriminant validity were established by correlating BIS/BAS scores with other well-established measures. All three facets of BAS were significantly correlated with measures of extraversion (drive $r = 0.41$, reward responsiveness $r = 0.39$, fun-seeking $r = 0.59$), positive affect (drive $r = 0.31$, reward responsiveness $r = 0.28$, fun-seeking $r = 0.19$), and positive temperament (drive $r = 0.39$, reward responsiveness $r = 0.35$, fun-seeking $r = 0.25$). In contrast, BIS correlated significantly with measures of manifest anxiety ($r = 0.58$), negative temperament ($r = 0.45$), and harm avoidance ($r = 0.59$). Discriminant validity was also observed by the demonstration of non-significant correlations between various unrelated measures. BIS was not significantly correlated with measures of extraversion ($r = -0.14$), positive affectivity ($r = -0.06$), and positive temperament ($r = -0.12$). Conversely, BAS was not significantly correlated with measures of anxiety (drive $r = -0.10$, reward responsiveness $r = 0.13$, fun-seeking $r = -0.03$), negative temperament (drive $r = 0.06$, reward responsiveness $r = 0.05$, fun-seeking $r = 0.03$), and negative affectivity (drive $r = -0.07$, reward responsiveness $r = 0.05$, fun-seeking $r = -0.05$). This measure also demonstrated clinical utility, with BAS serving as a stronger predictor of the experience of happiness than measures of extraversion, and BIS serving as a stronger predictor of self-reported nervousness than measures of anxiety (Carver & White, 1994). Taken together, this measure displays adequate validity for use in the current study. With regard to the reliability of the three factors of BAS, drive ($\alpha = 0.76$) and reward responsiveness ($\alpha = 0.73$) demonstrated

acceptable alpha values. Fun-seeking demonstrated a lower alpha value of $\alpha = 0.66$. The reliability of BIS was demonstrated to be acceptable ($\alpha = 0.74$). This measure was demonstrated to have generalizability across samples in the United Kingdom, United States, and Italy.

The measure itself is a self-report measure consisting of 20 items, with 7 items assessing BIS, 5 items assessing BAS reward-responsiveness, 4 items assessing BAS drive, and the final 4 items assessing BAS fun-seeking. Items are presented in the form of a statement, with subjects responding based on a 4-point Likert scale, with a response of 1 indicating highest level of agreement and a response of 4 indicating lowest level of agreement. Neutral responses are not possible using this scale and several responses on this scale are reverse scored. Though the items assessing BAS sensitivity measure three distinct facet of this construct, the measure was administered in its entirety as moderation is being investigated in an exploratory manner in the context of the current study, and there are no a priori hypotheses with regard to how distinct facets of BAS will affect the relationship between discrepancy and symptom severity. Cronbach's alpha for the BIS scale in the current study was $\alpha = 0.83$, and Cronbach's alpha for the BAS scale in the current study was $\alpha = 0.83$.

Demographics. Following completion of the main measures, participants were asked to share demographic information. Variables of interest were age, gender, race, ethnicity, education, annual household income, and relationship status. Demographic questions were formatted so that responses could be selected from a drop-down menu (see Appendix H).

Plan of Statistical Analyses

Power analysis. A power analysis was conducted to determine the required sample size for the current study. The most complex proposed statistical model was evaluated, and the degrees of freedom within the saturated model was determined. In a model with 7 observed

variables (ideal-actual, ought-actual, DEP, GAD, SOC, PD, AGOR), 2 moderators (BIS/BAS) and pertinent demographic variables that should be controlled for (gender, ethnicity, age), the saturated model would have 78 degrees of freedom. As we were interested in estimating approximately 28 parameters, this left approximately 50 degrees of freedom for the most complex model that was run. Notably, as we were interested in evaluating group differences across the two samples in the study (MTurk and SONA) and a multiple group comparison was completed, the 50 degrees of freedom was doubled to 100. In order to be conservative in estimating an appropriate sample size for the study, it was assumed that degrees of freedom across models would range from 80 to 100, using the bottom of this range to establish a conservative sample size.

According to MacCallum, Browne and Sugawara (1996), root-mean-square error of approximation (RMSEA) can be used to determine power. RMSEA assesses the degree of misfit in a proposed model, with a value of zero indicating exact model fit (Chen, Curran, Bollen, Kirby, & Paxton, 2008). By using degrees of freedom, one is able to determine the sample size needed to accurately detect the differences between models with RMSEA values of .05 and .08 (close fit), where .05 is the RMSEA value for the null model (H_0), and .08 is the RMSEA value of the alternative or true model (H_a). Using 80 degrees of freedom, 200 participants were required to detect differences between models with RMSEA values of .05 and .08 with 91.1% power ($\beta = .893$). That is, with a sample of 200 and 80 degrees of freedom, there is a 91.1% probability of correctly rejecting the test of good fit (H_0) when the true fit (H_a) is unacceptable (MacCallum, Browne, & Sugawara, 1996). This level of accuracy is acceptable based on the conventionally acceptable power of .80 (Kraemer & Blasey, 2015). Notably, the use of 80 degrees of freedom to determine sample size was a conservative decision, as the estimated range

of degrees of freedom was 80 to 100. For the current study, the target sample size of 200 was used for each of the two methodologies (50% MTurk and 50% university sample), resulting in an overall target N of 400. Notably, based on invalid responding, only 353 participants provided valid data for statistical analysis. Based on the initial conservative power analysis and overestimation of sample size required, further data collection was not completed, and an overall sample size of 353 was retained. In order to support this decision, further investigation of adequate power was conducted. MaCallum and colleagues (1996) established a guide for minimum sample size to achieve power of 0.80. According to their guide, for 80 degrees of freedom, a test of close fit would require a sample size of 154. Alternatively, with 100 degrees of freedom, a sample size of 132 would be required. Both sample sizes exceeded these values (MTurk $n = 182$, SONA $n = 171$), indicating adequate power for both samples independently, and together.

Measurement and structural equation modeling. Structural equation modeling (SEM) analyses begin with the establishment of a measurement model with adequate goodness-of-fit statistics. Only after developing a measurement model with good fit can a structural model be run. The statistics of interest in determining goodness-of-fit for both measurement and structural models include RMSEA, the Chi-squared test, the Comparative Fit Index (CFI) and the Tucker-Lewis Index (TLI). With regard to establishing a model with good fit, an RMSEA value of less than 0.05 is indicative of close fit, while values between 0.05 and 0.08 indicate fair fit, and values exceeding 0.10 indicate poor fit (Maccallum et al., 1996). With regard to the Chi-square test of model fit, good fit is indicated by a non-significant Chi-square statistic. Notably, however, this index of model fit is particularly sensitive to sample size, and therefore in larger samples sizes, this statistic is often times significant and should be evaluated in the context of other

indices of model fit (Tanaka, 1987). This is particularly true for structural equation models.

With regard to CFI and TLI fit indices, values equal to or greater than 0.95 are indicative of good fit, with fit being better as it approaches a value of 1.00 (Hu & Bentler, 1999).

SEM adopts a confirmatory rather than exploratory approach towards data, therefore is appropriate for the current research question, which is being approached with a preconceived theoretical framework. Not only does SEM allow for predictions between latent variables to be made, but it also examines the relationships between observed and latent variables, leading to the understanding of whether or not specific observed variables are good indicators of latent variables. Furthermore, SEM is useful when exploring more than one dependent variable. Uniquely, SEM allows for the evaluation of structural relations among dependent variables. This method of data analysis also allows for multiple group comparisons. That is, by comparing goodness-of-fit statistics across groups, similarity of structural paths across groups can be determined. This is relevant to the current study, as we examined the similarity of measurement and structural equation models across MTurk and SONA groups.

Moderation can be examined in the context of SEM by creating an interaction term between the independent variables and their respective moderators (e.g. actual-ideal X BAS, actual-ought X BIS). These interaction terms are entered into the structural model in order to determine if significant moderation is occurring in the model, and whether by accounting for moderation, the structural model fit improves.

To test differences across two samples, multiple group analysis is conducted. With regard to multiple group analysis, there are two typical approaches to comparing groups. Using the first approach, one assumes factor loading across groups are equivalent and test for differences. Using the alternative approach, all factor loadings are assumed to be different, and one may test to see

if paths are the same. Based on our hypothesis that there are no significant differences between groups, I selected the approach that assumes sameness across groups, and systematically tested for group differences across paths. For both the measurement model and structural model, each path is evaluated to determine whether they differed significantly across groups. This is accomplished by systematically constraining pathways, allowing them to differ freely one at a time, and completing a chi-square difference test. No significant differences in chi-square difference test (as hypothesized), would indicate no differences between groups along that particular path and that the more parsimonious model should be retained. This process is conducted first for the measurement model, and then the structural model.

Chapter 3

Results

Descriptive Analyses

Descriptive statistics were run for all demographic variables, as well as for variables central to statistical analysis. Demographic frequencies for the sample are presented in Table 1, and are displayed in terms of the MTurk sample ($n = 182$), SONA sample ($n = 171$), and the entire sample as a whole ($N = 353$). Descriptive statistics of demographics are presented for each independent sample in Table 2, along with results from one-way analysis of variance (ANOVA) tests, which were conducted to evaluate for significant differences in demographic variables across samples. Significant differences were observed across all demographic variables, with the exception of ethnicity, which did not differ significantly between groups. Significant demographic differences were expected given the wider demographic variability of a nationally representative sample relative to a rural university sample. Regression analyses were conducted to evaluate whether demographic variables were significant predictors of any of the outcome variables, and if they in turn should be controlled for in subsequent analyses. The variables of age, gender, and income were significant predictors of outcome variables (Table 3), and were therefore controlled for.

Table 2
Descriptive statistics for demographics across samples

	MTurk	SONA	ANOVA p -value
Variables	$M (SD)$	$M (SD)$	
Gender	1.62 (.55)	1.80 (.41)	.001*
Age	2.71 (1.19)	1.34 (.71)	<.001**
Ethnicity	1.92 (.28)	1.89 (.31)	.463
Race	4.73 (1.00)	5.12 (.72)	<.001**
Income	3.08 (1.60)	2.45 (1.71)	<.001**
Education	4.69 (1.66)	3.30 (1.05)	<.001**
Relationship status	2.38 (1.09)	1.98 (.90)	<.001**

Note. n MTurk = 182, n SONA = 171, * $p < .05$, ** $p < .001$, See Table 1 for variable categories.

Table 3

Association between demographic and dependent variables.

Independent Variable	Dependent Variable	Standardized Beta Coefficient	P-value
Gender	ACQ	.119	.025*
Age	CESD	-.148	.019*
Age	GAD	-.158	.014*
Age	ACQ	.137	.030*
Age	PDSS	-.146	.024*
Income	CESD	-.189	.000**
Income	GAD	-.121	.023*
Income	ACQ	.134	.011*

Note. N Total = 353, * $p < .05$, ** $p < .001$

All dependent, independent, and moderating variables were assessed for normality through the evaluation of skewness and kurtosis statistics, as well as visual inspection of normal distributions and p-p plots. Descriptive statistics, along with indicators of normality are presented in Table 4. Notably, two variables demonstrated positive skewness (PDSS and ACQ scores) and were therefore transformed (square root and inverse transformations, respectively). Their transformed values are present in Table 4. Transformation of these variables ensured that skewness did not exceed critical cut off (± 2 ; West, Finch, & Curran, 1995).

Table 4

Descriptive statistics of dependent, independent, and moderating variables

	Mean	SD	Range	Skewness	SE	Kurtosis	SE
Ideal disc.	-2.92	3.37	-12.00 - 9.00	0.152	0.130	0.374	0.259
Ought disc.	-3.93	3.34	-12.00 - 10.00	0.297	0.130	0.635	0.259
CESD	15.78	11.40	0.00 - 52.00	0.710	0.130	0.022	0.259
GAD	6.55	5.40	0.00 - 21.00	0.580	0.130	-0.518	0.259
ACQ	0.71	0.23	0.24 - 1.08	0.067	0.130	-1.153	0.259
PDSS	1.43	1.38	0.00 - 4.90	0.403	0.130	-1.149	0.259
SPIN	22.00	15.42	0.00 - 65.00	0.351	0.130	-0.863	0.259
BIS	20.49	4.53	7.00 - 28.00	-0.574	0.130	0.172	0.259
BAS	39.09	6.08	19.00 - 52.00	-0.342	0.130	0.034	0.259

Note. N Total = 353, (Ideal disc. = actual: ideal discrepancy score, Ought disc. = actual: ought discrepancy score, CESD = Center for Epidemiological Studies Depression Scale, GAD = Generalized Anxiety Disorder – 7 scale, ACQ = Agoraphobic Cognitions Questionnaire, PDSS = Panic Disorder Severity Scale, SPIN = Social Phobia Inventory, BIS = Behavioral Inhibition Scale, BAS = Behavioral Activation Scale).

Following the evaluation of skewness and kurtosis, and after appropriate transformations were made, outliers were evaluated through the use of stem-and-leaf plots. With a maximum of 6 outliers being observed across CESD scores, BAS scores, and ideal and ought discrepancy scores, the decision was made to maintain all outliers for analyses, so as to ensure variance in the data set. The data set did not have any missing data due to the nature of the data collection methods which prevented participants from moving through questions without having fully completed previous questions. Participants were made aware of this requirement during informed consent.

Zero-order correlations were run for all variables of interest, and these are presented in Table 5. Notably, significant correlations were observed across several dependent and independent variables. While most of these correlations were expected based on the existing literature, unanticipated correlations were also observed (for example, PDSS scores with BAS scores), and will be addressed further in the discussion section.

Table 5
Correlations between dependent, independent, and moderating variables

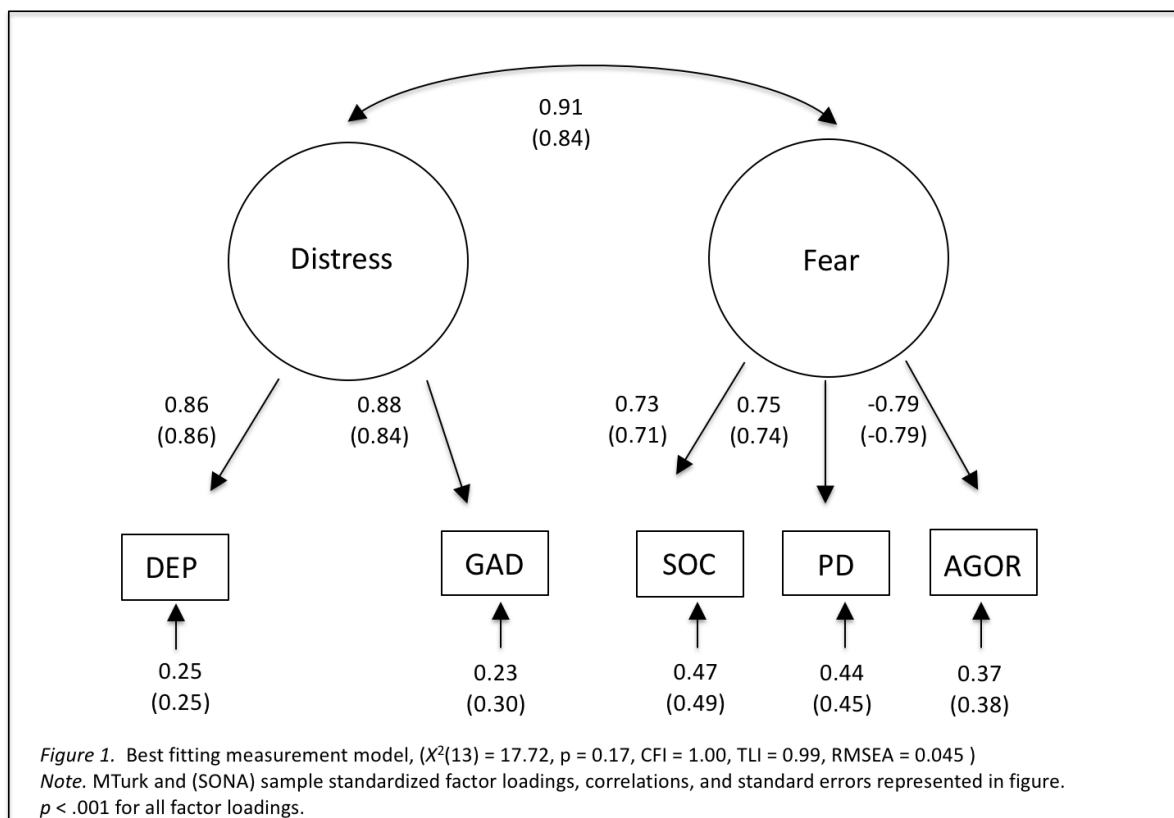
	1	2	3	4	5	6	7	8	9
1. Ideal disc.	-								
2. Ought disc.	0.69***	-							
3. CESD	0.24***	0.21***	-						
4. GAD	0.17**	0.14***	0.75***	-					
5. ACQ	-0.20***	-0.20***	-0.60***	-0.61***	-				
6. PDSS	0.10	0.08	0.56***	0.59***	-0.60***	-			
7. SPIN	0.18**	0.15*	0.59***	0.53***	-0.58***	0.54***	-		
8. BIS	0.23***	0.18**	0.37***	0.48***	-0.37***	0.33***	-0.48***	-	
9. BAS	-0.10	-0.08	-0.12***	-0.08	0.10	-0.13*	-0.28***	-0.04	-

Note. N Total = 353, * $p < .05$, ** $p < .01$, *** $p < .001$

Primary Analyses

Measurement model. Within the current model, symptom severity measures of generalized anxiety disorder and major depressive disorder were used as indicators of the latent variable, distress-based disorders (see Figure 1). Within the same model, the latent variable of

fear-based disorders was comprised of symptom severity measures pertaining to panic disorder, agoraphobia, and social anxiety disorder. Notably, the only model modification required, based on modification indices approaching 10, was to control for mean CESD scores which differed significantly across groups. Mean CESD scores were therefore allowed to be different between the two groups during the development and assessment of the measurement model.



Observed variables loaded onto their respective latent constructs significantly for both MTurk and SONA samples (see Figure 1, standardized beta values). In the MTurk sample, with regard to distress-based disorders, all observed indicators loaded significantly onto the distress-based disorders latent variable (CESD $\beta = 0.86$, GAD $\beta = 0.88$). In this sample, all observed indicators loaded significantly onto fear-based disorders latent variable as well (SPIN $\beta = 0.73$, PDSS $\beta = 0.75$, ACQ $\beta = -0.79$). With regard to distress-based disorders in the SONA university sample, all observed indicators loaded significantly onto the distress-based disorders latent

variable (CESD $\beta = 0.86$, GAD $\beta = 0.84$). This was also the case for the fear-based disorders latent variable in the SONA university sample (SPIN $\beta = 0.71$, PDSS $\beta = 0.74$, ACQ $\beta = -0.79$). The measurement model yielded a good fit to the data ($\chi^2(13) = 17.72$, $p = 0.17$) and fit indices were excellent (CFI = 1.00, TLI = 0.99, RMSEA = 0.045).

In order to examine whether factor structure was significantly different across MTurk and SONA samples, factor loading parameters were systematically unconstrained, allowing for each factor loading to vary across groups, one at a time. It was hypothesized that there would be no significant differences in measurement models across samples, as a similar structure of internalizing disorders has been observed across large and diverse samples (Slade & Watson, 2006; Wright et al., 2013). Chi-square difference tests were then used to compare the goodness of fit of two nested models; the larger model allowed one set of loadings to be different across groups while the smaller model constrained the loadings to be the same. If the deviance statistic of any comparison exceeded the critical value of 3.84 ($\chi^2(1) = 3.84$, $p < .05$), this indicated that the more complex model, in which factor loadings differed across group, represented a stronger model fit. For the latent variable of distress, the two groups were not significantly different across the observed variables of CESD scores ($\chi^2(1) = 1.33$, $p > 0.05$) and GAD scores ($\chi^2(1) = 1.33$, $p > 0.05$). For the latent variable of fear, the two groups did not significantly differ across the observed variables of PDSS scores ($\chi^2(1) = 0.294$, $p > 0.05$), ACQ scores ($\chi^2(1) = 0.001$, $p > 0.05$), and SPIN scores ($\chi^2(1) = 0.255$, $p > 0.05$). Taken together, the lack of any significant deviance statistics indicates that the university sample and MTurk sample did not significantly differ in factor loadings of the two latent variables – distress and fear. In other words, the most simplistic model in which factor loadings are the same across groups, while allowing for CESD mean differences between groups (MTurk $M = 14.27$, SONA $M = 17.37$) can be maintained.

The measurement model is presented with standardized beta values for both samples in Figure 1, with university sample beta values being presented in parentheses.

Structural model. Upon determining an acceptable measurement model (see Figure 1), a structural model was formulated to test the hypotheses that actual-ideal discrepancy would significantly predict symptom severity across distress-based disorders, and actual-ought discrepancy would predict symptom severity across fear-based disorders. SEM was also used to conduct multi-group analyses and to test for moderation.

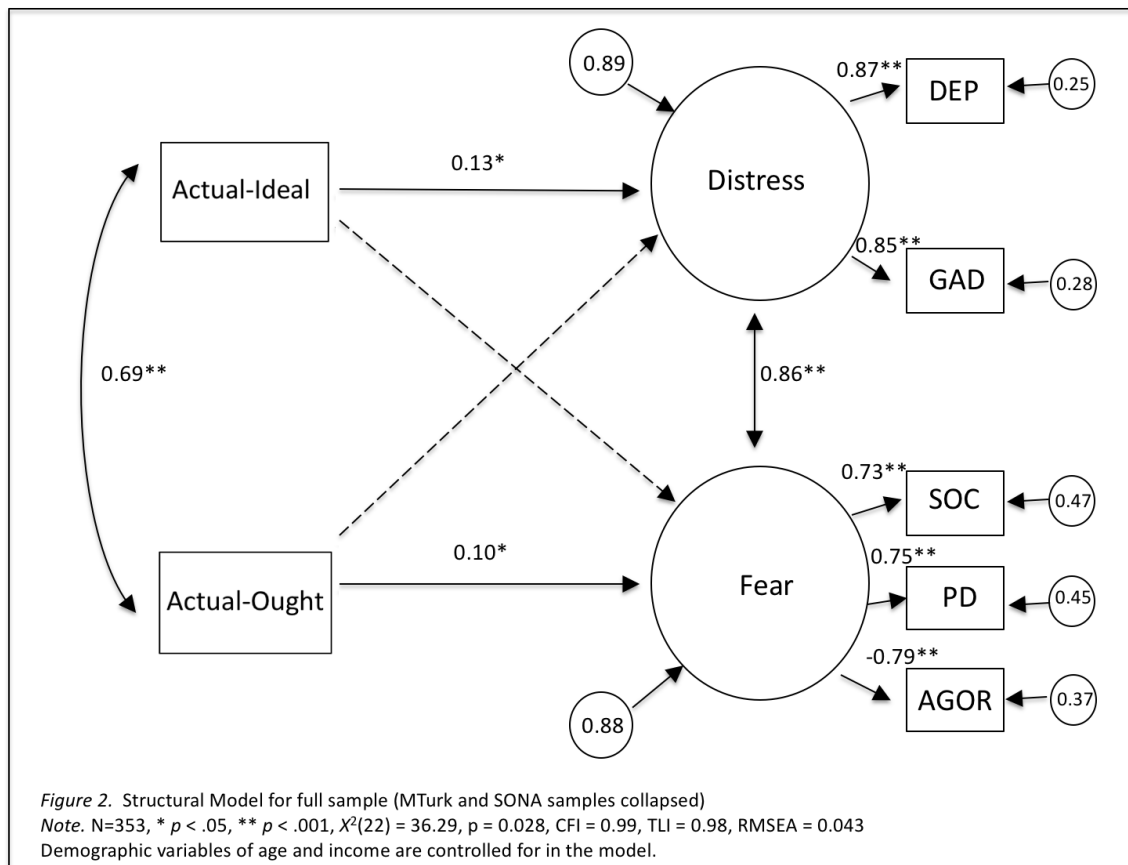
In the initial structural model, age, income, and gender were entered in the model as control variables based on initial regression analyses on observed outcome variables. However, gender did not significantly predict distress or fear latent variables ($p > 0.05$, for both), and therefore was removed from the model. Age was a significant predictor of the fear latent variable in both the MTurk ($\beta = 0.29, p < .001$) and SONA ($\beta = 0.18, p < 0.001$) samples. Age was also a significant predictor of the distress latent variable across MTurk ($\beta = -0.19, p < .05$) and SONA ($\beta = -0.11, p < .05$) samples. Income was a significant predictor of the fear latent variable in both the MTurk ($\beta = 0.15, p < .05$) and SONA ($\beta = 0.16, p < .05$) samples. Income was a significant predictor of the distress latent variable in both the MTurk ($\beta = -0.17, p < .05$) and SONA ($\beta = -0.18, p < .05$) samples.

Multi-group analyses were conducted to determine if significant differences in the structural model existed across samples. It was hypothesized that no significant differences across groups would be observed based on previous studies on self-discrepancy that have been conducted across a range of research participants (both community and college samples; Bruch et al., 2000; Weilage & Hope, 1999). Analyses began under the assumption that all pathways were the same across groups. As the Mplus program by default assumes all structural pathways

to be different, the initial model was run with constraints; each constraint was released one at a time to determine whether a structural path differed significantly across samples. Upon releasing constraints, a chi-square difference test was conducted to determine if the difference between groups was significant. If no significant difference was observed across groups (deviance statistic less than 3.84 with one degree of freedom), the more parsimonious model (equal beta coefficients across groups) was maintained. Notably, and as predicted, ideal-discrepancy was not a significant predictor of the fear latent variable ($p > .05$) and ought-discrepancy was not a significant predictor of the distress variable ($p > .05$). Therefore, these pathways were constrained to zero in the structural model (as indicated by dashed lines in Figure 2) so as to increase degrees of freedom during analyses.

Controlling for age and income, most of the structural paths were the same across groups: the relationship between ideal discrepancy and symptom severity across distress-related disorders ($\chi^2(1) = 0.06, p > .05$); the relationship between ought discrepancy and symptom severity across fear-based disorders ($\chi^2(1) = 2.71, p > .05$); the correlation between fear- and distress-based disorders ($\chi^2(1) = 1.00, p > .05$); the relationship between age and distress based disorders ($\chi^2(1) = 2.87, p > .05$); the relationship between income and distress based disorders ($\chi^2(1) = 0.43, p > .05$); the relationship between age and fear-based disorders ($\chi^2(1) = 0.49, p > .05$); and the relationship between income and fear-based disorders ($\chi^2(1) = 3.44, p > .05$). There was one exception. The correlation between ideal and ought discrepancy ($\chi^2(1) = 5.67, p < .05$) was different across samples. In the MTurk sample, the correlation was 0.72 ($p < .001$), while in the SONA sample, the correlation was 0.63 ($p < .001$). As this correlation remained high in both groups, and were both significant at $p < .001$, data was collapsed across groups to establish the best fitting model, as no other significant differences were present across samples. Based on

model fit analyses collapsing both samples, the structural model yielded a good fit to the data ($\chi^2(22) = 36.29, p = 0.028$). Notably, the chi-square of model fit is significant, which typically indicates poor fit. The chi-square test of model fit is sensitive to sample size, and in larger samples (such as the current study), is often significant (Tanaka, 1987). Another way to use this statistic to determine goodness of fit in a large sample is to divide the chi-square statistic by degrees of freedom (Bollen & Long, 1992). By convention, if the resulting number is 2 or less (in this case $36.29/22 = 1.65$), this is indication of good fit. In addition, other fit indices of the model were excellent (CFI = 0.99, TLI = 0.98, RMSEA = 0.043). The structural model for the entire sample is presented in Figure 2. With regard to effect size, actual-ideal discrepancy accounted for 11% of the variance of distress-based disorders, ($R^2 = 0.11$), and actual-ought discrepancy accounted for 12% of the variance of fear-based disorders ($R^2 = 0.12$).



Moderation analyses. Moderation analyses were conducted to determine if model fit indices would be enhanced with the inclusion of BIS and BAS as moderators of the relationships between predictor and latent variables. Interaction terms were developed by multiplying ideal discrepancy scores with total BAS scores, and ought discrepancy scores with BIS scores. Interaction terms were then included in the model in order to determine whether they were significant predictors of latent variables.

The inclusion of interaction terms in the model indicated poor fit to the data ($\chi^2(107) = 2589.08, p < 0.001$, CFI = 0.00, TLI = -1.20, RMSEA = 0.36). In examination of beta values, BAS was not a significant moderator of the relationship between ideal discrepancy and distress symptom severity ($\beta = -0.003, p = .77$), and BIS was not a significant moderator of the relationship between ought discrepancy and fear symptom severity ($\beta = 0.00, p = .65$). In addition, this relationship did not significantly differ between samples, as deviance statistics did not exceed critical cut off scores of 3.84. This indicates that BIS and BAS were not significant moderators for either sample. Based on the analysis of moderators, the best fitting model remains the model in which moderators are not included in the analyses (Figure 2).

Chapter 4

Discussion

The purpose of the current study was to develop a transdiagnostic model of self-discrepancy and emotional disorders that was capable of addressing issues of multifinality and divergent trajectories. In doing so, not only did we aim to identify self-regulatory mechanisms underlying fear- and distress-based disorders, we also attempted to understand some of the dispositional factors that might impact the relationship between self-discrepancy and emotional functioning. Data was collected from two independent samples (MTurk = 182, SONA = 171) using online data collection methods. SEM was used to test the stated hypotheses. My findings supported a transdiagnostic model in which actual-ideal discrepancy significantly predicted symptom severity across distress-based disorders (DEP, GAD; hypothesis 1) and actual-ought discrepancy significantly predicted symptom severity across fear-based disorders (SOC, PD, AGOR; hypothesis 2). As predicted (hypothesis 5), structural paths did not significantly differ between the two samples used in the study. Contrary to our predictions (hypotheses 3 and 4) BIS and BAS scores did not significantly moderate the discrepancy-symptom severity pathways in either sample.

While my findings supported a transdiagnostic model capable of addressing multifinality, the model did not successfully address divergent trajectories given the lack of significant moderation by BIS/ BAS. Though unsuccessful in identifying individual differences that serve as moderators, the resulting transdiagnostic model effectively supported the hypotheses that various types of discrepancy, as outlined by SDT, predict symptom severity across clusters of emotional disorders within a transdiagnostic taxonomy. Not only do these findings have implications for

intervention, but they also hold implications for how psychological disorders are organized and understood.

The first hypothesis was supported, in that individuals who reported more discrepancy between their actual self-concept and their ideal self-concept, as perceived by themselves and their significant others, experienced greater symptom severity across distress-based disorders than fear-based disorders. Notably, the relationship between actual – ideal discrepancy and fear-based disorders was not significant, giving further support to the distinct relationship between this particular type of discrepancy and distress-based disorders. Based on SDT, this particular type of discrepancy is related to dejection-related emotions. In addition, this form of discrepancy has been shown to have a relationship with depressive symptoms and low positive affect (Bruch et al., 2000; Strauman, 1989). Findings from the current study replicate findings from university samples, but also serve to broaden overall generalizability and theoretical implications as structural pathways did not differ across university and MTurk samples.

The second hypothesis of the study was also supported, in that individuals who reported more discrepancy between their actual self-concept and their ought self-concept, as perceived by themselves and their significant others, experienced greater symptom severity across fear-based disorders than distress-based disorders. Notably, a relationship between this particular form of discrepancy and distress-based disorders was not significant, giving further support to the distinct relationship between this particular type of discrepancy and fear-based disorders. While the relationship between actual-ought discrepancy and fear-based disorders was hypothesized based on SDT, in the past, researchers have struggled to demonstrate a consistent empirical association between actual-ought discrepancy and psychological functioning. For example, when this discrepancy was evaluated by Brush and colleagues (2002) in the context of the tripartite

model, it was not demonstrated to have a relationship with specific factors related to anxiety, nor did it show an association with any other aspect of the model (Bruch et al., 2000). In sharp contrast, when individual differences in self-discrepancies were evaluated by Phillips and Silvia in 2010, actual-ought discrepancy demonstrated a relationship to anxious affect as well as depressed affect (Phillips & Silvia, 2010). It should be noted that in the aforementioned study by Bruch and colleagues, ought-discrepancy was only developed based on the “other” standpoint, and a sample size of 84 was used. In the study by Phillips and Silvia (2010), discrepancy was not calculated using the Selves Questionnaire, the gold standard measure to assess for self-discrepancy. Rather than calculating matches and mismatches, discrepancy from ideal and ought self-guides was rated on a 7-point scale. Lack of consistency in measurement as well as small sample size may contribute to the general lack of clarity surrounding the relationship between actual-ought discrepancy and psychopathology. The current study addressed some of these concerns by using a large and fully powered sample, using the Selves Questionnaire, and ensuring that all relevant standpoints that contribute to self-concept were assessed. The current findings suggest that there is, in fact, a distinctive relationship between actual-ought discrepancy and fear-based disorders, and that self-regulatory processes related to avoidance motivation may be an underlying feature of disorders within the fear-based disorder latent construct.

As both actual-ought and actual-ideal discrepancy were distinctively related to fear- and distress-based disorders, respectively, there is ostensible utility in the examination of this particular self-regulatory process in the context of Krueger’s fear- and distress-based disorder taxonomy. Findings from the current study not only replicated the factor structure of the fear- and distress-based disorder taxonomy, they also identified a unique self-regulatory process (self-discrepancy) underlying the latent constructs within the taxonomy. As such, findings continue to

address the question of *why* disorders covary with one another, which was the initial starting point for the development of Krueger's taxonomy. Mechanisms underlying fear- and distress-based disorders have been scientifically investigated in the past. For example, dimensions of anxiety sensitivity (AS) have been examined in the context of this taxonomy, with results suggesting that AS cognitive concerns are distinctly related to distress-disorders, and AS physical concerns are distinctly related to fear-disorders (Allan et al., 2015). Yet, there has been a lack of scientific inquiry with regard to how self-regulatory processes relate. The current study serves as an initial examination of the self-regulatory processes underlying fear- and distress-based disorders, and has clinical utility in the context of treatment.

Effect size should be acknowledged with regard to the current findings. While actual-ideal discrepancy accounted for 11% of the variance of distress-based disorders, ($R^2 = 0.11$), actual-ought discrepancy accounted for 12% of the variance of fear-based disorders ($R^2 = 0.12$). While these effects aren't to be overlooked, they do represent a relatively small proportion of variance. Given the high correlation between fear- and distress-based disorders ($r = 0.86, p < .001$), as well as the two identified types of discrepancy ($r = 0.69, p < .001$), it should be noted that ultimately there appear to be more similarities than differences across the internalizing disorders evaluated, and types of self-discrepancy assessed. The current findings should therefore not be interpreted as groundbreaking. Instead, the current findings may serve to enhance treatment outcomes for presentations of psychopathology in which failures or deficits in self-regulation are observed.

Various forms of interventions currently target self-discrepancy to improve psychological functioning. While some interventions work to develop more effective self-regulation strategies, others aim to increase congruence with self. Ultimately, both approaches aim to alter one's

experience of self-discrepancy, and thereby improve psychological functioning. For example, Acceptance and Commitment Therapy (ACT; Hayes, Luoma, Bond, Masuda, & Lillis, 2006), a third wave cognitive-behavioral approach, emphasizes the importance of acceptance and value-based action on psychological well-being. Acceptance refers to “a moment to moment process of actively embracing private events evoked in the moment without unnecessary attempts to change their frequency or form” and values refer to “chosen life directions” (Fletcher & Hayes, 2005, pp. 319, 321). Though there has not been empirical examination of self-discrepancy in the context of ACT interventions, a theoretical relationship exists between them. In thinking of the aforementioned ACT principles in the context of SDT, acceptance serves to decrease salience of discrepancies with regard to one’s experience of the self, while engaging in value-based action serves to close the gap between one’s actual and ideal self-concept. In addition to ACT, a therapeutic approach called Self-System Therapy (SST) was borne from research on SDT and was developed for the treatment of depression (Vieth et al., 2003). SST is a brief intervention that targets failures in self-regulation that impact one’s ability to pursue promotion goals effectively; an issue often observed in depression. SST does so by means of emphasizing four main treatment goals. These goals are education on the relationship between self-regulation and depression, re-initiation of promotion focused behavior, evaluation of regulatory style, and modification of problematic self-regulatory patterns. In a randomized control trial comparing SST and cognitive therapy (CT), both interventions were found to be equally efficacious, and SST demonstrated greater efficacy for individuals whose socialization history did not have an emphasis on promotion goals (Strauman et al., 2006). While these interventions address self-discrepancy, their effectiveness may be enhanced by findings from the current study which demonstrate that there are two distinctive types of self-discrepancy that may serve as treatment

targets, and these discrepancies span multiple disorders, making them transdiagnostic processes. For example, findings pertaining to the relationship between actual-ideal discrepancy and distress-based disorders have direct implications for SST, which was developed only for the treatment of depression. Findings from the current study suggest that individuals with symptoms of generalized anxiety disorder may also be exhibiting similar self-regulatory strategies as individuals with depression, and in turn may benefit from similar therapeutic interventions. In addition, findings from the current study may also contribute to the elaboration of such treatment approaches, so as to also target those self-regulatory processes observed across fear-based disorders. For example, as SST currently aims to address difficulties in self-regulation that result in ineffective pursuit of promotion goals, a comparable treatment for fear-based disorders would guide individuals towards more effective pursuit of goals through increased insight as to how their prevention focused orientation has been ineffectual.

The third and fourth hypotheses regarding moderation were not supported in the current study. That is, the relationship between actual-ideal discrepancy and symptom severity across distress-based disorders was not significantly moderated by BAS scores (hypothesis 3), and the relationship between actual-ought discrepancy and symptom severity was not significantly moderated by BIS scores (hypothesis 4). There are several potential reasons why moderation was not observed. Upon examination of the correlations between BAS and observed dependent variables, it is notable that this moderator was significantly, though moderately, correlated with CESD scores ($r = -0.19, p < .001$), PDSS scores ($r = -0.13, p < .05$), and SPIN scores ($r = -0.28, p < .001$). BAS may not have been a good predictor of distress-based disorders due to its correlation with disorders falling within the fear-disorder latent construct. Notably, while BAS has demonstrated previous associations with depression and social anxiety (Kasch et al., 2002;

Kimbrel et al., 2012), there has been little to no evidence in the literature to support an association between panic disorder and BAS sensitivity (Johnson, Turner, & Iwata, 2003). It may have been the case that based on the particular sample or modality of data collection (online), participants with a tendency to experience panic-like symptoms also exhibited lower BAS sensitivity. One potential explanation for this unique relationship is increased rates of comorbidity between panic disorder and social anxiety and/or depression in the current sample. Panic disorder symptom severity scores were highly correlated with scores on the measures of depression ($r = .56, p < .001$) and social anxiety ($r = .54, p < .001$). High comorbidity rates may have resulted in lower BAS scores for individuals with panic, given that lower BAS scores are typically observed in individuals with depression and social anxiety. In addition, it is notable that studies evaluating the characteristics of online subject pools have found that those who engage in these methods of data collection report disproportionately high levels of social anxiety. In a study by Shapiro and colleagues, 50.5% of respondents met criteria for social anxiety disorder, sharply contrasting the 6.8% 12-month prevalence rate observed in the general population (Shapiro, Chandler, & Mueller, 2013). An investigation of social anxiety endorsement within the current sample revealed similar statistics to those found by Shapiro and colleagues, in that 47.9% of the whole sample endorsed symptoms of social anxiety falling in the mild to severe range based on cut off scores of the SPIN measure (Connor et al., 2000). Given the potentially high rates of comorbidity between panic and social anxiety/depression and the generally high endorsement of social anxiety within the sample, BAS was likely only weakly associated with the distress-based disorder latent construct, affecting moderation of the relationship between actual-ideal discrepancy and distress.

As BAS consists of 3 distinct facets, it may also have been the case that reward-

responsiveness, fun-seeking, or drive significantly moderated the relationship between actual-ideal discrepancy and distress-based disorders, with their effects being masked by combining these facets into a total score. For example, it may have been the case that reward responsiveness significantly moderated the relationship between actual-ideal discrepancy and distress-based disorders, as this particular facet directly measures sensitivity to reward, while the other factors measure one's tendency to engage in fun-seeking, and dispositional differences in drive. However, as the investigation of moderation was exploratory in nature, these facets were not examined individually as no a-priori hypotheses were developed based on the literature.

Lack of moderation by BIS may be the result of both actual-ought discrepancy and behavioral inhibition system sensitivity tapping into constructs related to avoidance motivation. Upon examination of the best fitting structural model (Figure 2), when total BIS scores are entered as an observed independent variable in the model, actual-ought discrepancy is no longer a significant predictor of fear-based disorders ($p = 0.60$) and total BIS score becomes the only significant predictor in the model ($p = <.001$). In other words, the inclusion of total BIS score may be masking the effects of discrepancy on fear-based disorders. As such, when moderation is evaluated, neither the moderator nor the independent variable remain significant predictors of symptom severity in fear-based disorders. It may then be the case that total BIS score and actual-ought discrepancy measure very similar constructs, accounting for lack of significant moderation. In the case of both moderators, it may alternatively be the case that dispositional behavioral tendencies do not significantly impact the effects of discrepancy on symptom severity across fear- and distress-based disorders. Nevertheless, lack of significant moderation findings allows for new moderators to be considered in the context of the established transdiagnostic model. Specifically, it may be the case that instead of evaluating behavioral tendencies as

moderating variables, it might be more pertinent to evaluate cognitive tendencies, such as the effects of cognitive biases. Alternatively, constructs such as self-efficacy may be of interest to evaluate, as this construct relates to one's ability to produce a desirable outcome through one's own actions (Maddux, 2016). Findings from the current study provide a transdiagnostic model that may be elaborated upon so as to not only account for multifinality, but also divergent trajectories, as recommended by Nolen-Hoeksema and Watkins (2011). The identification of divergent trajectories in future studies may aid in our understanding of what kind of individual differences might buffer against the negative effects of self-discrepancy on psychological and emotional functioning.

The final hypothesis was supported, in that no significant differences in structural paths were observed between MTurk and SONA samples. That is, the relationship between actual-ideal discrepancy and distress-based disorders, and actual-ought discrepancy and fear-based disorders was consistent in both MTurk and SONA samples. Moderation was also not significant for either sample. This hypothesis was proposed based on the theoretical underpinnings of the research question, in that SDT predicts emotions resulting from discrepancy which should be consistent regardless of whether a sample is more or less clinical in nature. While several demographic variables were significantly different between samples, previous psychological research in MTurk samples has demonstrated that regardless of these differences, behavioral and psychological outcomes are often indistinguishable between MTurk and university samples (Casler et al., 2013). In addition, during structural equation modeling the only elevated modification index suggested that mean depression scores differed significantly between groups, resulting in a best fitting model which allowed for CESD scores to vary for each sample. As this was the only mean symptom severity score that significantly differed across groups, it can be

deduced that with regard to endorsement of symptoms, more similarities than differences were observed between the MTurk and SONA groups. While self-discrepancy has been evaluated in relation to psychological disorders in university samples, the current findings enhance generalizability and applicability with regard to the relationship between SDT and emotional functioning, as the MTurk sample was used in the study as a proxy for a nationally representative sample.

Overall, findings from the current study offer advancements to the field of clinical psychology in that they serve to further our understanding of transdiagnostic self-regulatory processes that impact emotional well-being. As understanding the relationship between motivation and psychopathy is a goal outlined in RDoC, the current study serves to advance transdiagnostic research by examining how perceived distance from one's approach- and avoidance-related goals (self-discrepancy) relate to emotional disorders. Furthermore, as findings elucidate our understanding of how self-discrepancy relates to fear- and distress-based disorder, the current study enhances our knowledge of the mechanisms underlying these clusters of emotional disorders, in turn contributing to increased efficacy and effectiveness of interventions focused on developing congruence and cultivating effective self-regulation.

In addition, findings provide further evidence for the utility of the fear- and distress-based disorder taxonomy of internalizing disorders. As previously discussed, there are several different ways of understanding internalizing disorders within the field of psychology. While the tripartite model of emotional distress was unable to fully account for the predictions of SDT, this study serves to enhance support for the continued research surrounding the fear- and distress-based disorder taxonomy of internalizing disorders by being able to account for the predictions of this theory (Clark & Watson, 1991; Krueger, 1991). These findings may inform further research

investigating other self-regulatory processes as they relate to fear- and distress-based disorders. While the current study did not support moderation by BIS and BAS, findings do prompt new questions with regard to individual differences that might impact the relationship between self-discrepancy and emotional disorders, such as cognitive biases, and individual differences in self-efficacy.

Limitations

It is important to acknowledge that while the current study holds positive implications for the field of psychology, it is not without its limitations. Firstly, the current study was cross-sectional in nature, and therefore it is not possible to infer causality. That is to say, while theoretically discrepancy leads to either dejection or agitation/fear related emotions, the current study is unable to empirically demonstrate this directionality. While it may be the case that self-discrepancy leads to such emotions, it may also be the case that individuals who experience depressive symptoms, for example, then develop a discrepancy between their actual and ideal self-concept through cognitive distortions and biases (Everaert, Duyck, & Koster, 2014). Alternatively, this relationship may be bidirectional, in that discrepancy might impact the development of symptoms, which in turn further increases discrepancy, and so forth. Different methodology (such as longitudinal data collection) is needed to effectively establish directionality.

Another limitation of the current study relates to the samples used for data collection. MTurk was used within the current study for the purpose of enhancing demographic diversity of participants, and in turn, generalizability. While MTurk participants were used as a proxy for a nationally representative sample, it may be the case that individuals who engage with online subject pools differ in a significant way from the general population. This may also hold true for

university sample participants who select online research studies versus studies requiring in person attendance. One difference that was already noted was the increased prevalence of significant social anxiety in the sample relative to the general population. Previous studies have demonstrated that MTurk participants may, on average, endorse more psychological symptoms than the general population (Arditte, Demet, Shaw, & Timpano, 2016). High prevalence of psychological symptoms may have accounted for the unexpected association found between BAS and symptoms of panic. While findings of the current study are generalizable to individuals who participate in online studies, it remains unclear as to whether the same relationship between self-discrepancy and emotional disorders exists in the general population. While the use of an MTurk sample rather than solely a university sample broadens generalizability, it is unclear as to *how* generalizable the current findings are based on the use of an online subject pool.

Closely associated with the above stated limitation is the modality in which data was collected. The use of online measures serves several benefits with regard to study dissemination, cost, ease of accruing participants, and the immediate transportability of data into statistical programs. While there are several benefits of online data collection, there are also significant limitations. Validity checks were failed by 47 participants during data collection, indicating that individuals were potentially not attending to self-report questions or did not understand the instructions. Not only did this result in unusable data, but also in unnecessary compensation for invalid responding. In-person data collection may have circumvented invalid responding by ensuring that only humans were able to participate in data collection, that participants attended to the measures, and that participants fully understood instructions prior to the completion of the study.

The Selves Questionnaire is a measure requiring hand-scoring. Self-discrepancy scores

are developed through use of an online thesaurus. Synonyms and antonyms are evaluated across conditions to determine matches and mismatches of attributes across domain: standpoint combinations. The required use of this measure serves as a limitation due to the immense amount of time required to develop discrepancy scores, and the potential human-error that may result as a byproduct of evaluating synonyms and antonyms using an online thesaurus. While in the current study, measures were taken to ensure high reliability among coders and data checking occurred consistently, taking these additional measures is a time-consuming task. The resources that must be devoted to using this measure to develop discrepancy scores is a significant limitation, especially when used with a large sample size. In fact, this might account for the variability of discrepancy measures seen in the literature, small sample sizes typically observed in studies that use this measure, and the lack of consistent use of the Selves Questionnaire. The development of an alternative measure that is effective in developing meaningful discrepancy scores and has concurrent validity with the Selves Questionnaire would potentially facilitate more investigation of self-discrepancy as a self-regulatory process.

Future Directions

While the current study offers meaningful findings that contribute to the field of psychology, it should be emphasized that this data represents an initial investigation of self-discrepancy as a transdiagnostic self-regulatory process. As is with all scientific findings, there is need for replication of the current findings in order to be confident that they did not occur by chance and are not limited to the samples used in the current study. It may be beneficial for the findings of the current study to be replicated in a general population sample, as it may be the case that online data collection methods yield samples with increased social anxiety, potentially skewing results. In addition, it may be especially beneficial for these findings to be replicated in

a clinical sample as this may yield the most clinical utility. Replication of the identified problematic patterns of self-regulation in a clinical sample may bolster research on interventions targeting self-discrepancy and self-regulatory processes.

The current study also serves as a starting point for further scientific inquiry with regard to transdiagnostic self-regulatory processes. While literature has identified some of the mechanisms associated with fear and distress based disorders, including emotional reactivity, anxiety sensitivity, and affect-modulated startle (Allan et al., 2015; Nelson, Perlman, Hajcak, Klein, & Kotov, 2015; Vaidyanathan, Patrick, & Cuthbert, 2009), there has been little research with regard to self-regulatory processes in the context of this taxonomy. In understanding psychological disorders, it is of vital importance to explore multiple levels of analysis. Much of the existing literature thus far has examined mechanisms from a neurobiological and physiological standpoint, contributing to our understanding of more distal risk factors for the development of fear- and distress- based disorder. Continued investigation of cognitive processes underlying these disorders may guide clinicians and researchers toward a more thorough understanding of proximal risk factors in the development of these disorders. Additionally, investigation of cognitive processes underlying these disorders may be of particular relevance to clinical psychologists given their potential value as treatment targets, and the current widespread popularity of cognitive-behavioral therapies (Craske, 2010).

In order to address the directionality limitations of the current study, future studies may aim to examine the relationship between self-discrepancy and fear- and distress- based disorders in a longitudinal manner. In doing so, it will become more clear as to whether self-discrepancy facilitates increased symptom severity. Should this be the case, interventions aimed at prevention may become more feasible. As self-guides develop through early relational experiences,

particularly through the parental relationship (Lange et al., 2012), addressing self-regulatory processes from an early age may serve to decrease self-discrepancy, and in turn, risk for the development of fear and distress-based disorders.

Regardless of directionality, the current study holds implications for intervention. While interventions currently exist to target self-regulatory processes and self-discrepancy, these interventions are likely not being optimized to effectively treat individuals using a transdiagnostic approach. While SST specifically targets depressive symptoms, the current findings demonstrate that similar self-regulatory problems can be observed in generalized anxiety disorder. Future studies may aim to investigate the SST treatment effectiveness and efficacy for individuals with distress-based disorders, broadly, rather than depressive disorders alone. In a similar vein, given the common self-regulatory processes that occur across the anxiety disorders subsumed under fear-based disorders, optimizing SST to target self-regulatory processes within fear-based disorders may be of significant clinical utility.

With regard to the development of a transdiagnostic model capable of addressing divergent trajectories, new moderators might be considered in the context of the current transdiagnostic model. Examining the moderating effects of the facets of BAS may constitute an important future direction for research so as to determine how individual differences in behavioral approach motivation impacts the relationship between self-discrepancy and psychopathology. It may also be the case that cognitive rather than behavioral constructs should be considered as potential moderators. For example, self-efficacy, an individual's belief in their ability to obtain a desired goal through their own efforts (Maddux, 2016), may be an important construct to consider as it pertains to one's cognitive representation of their ability. As discrepancy represents distance from one's goals, whether they be approach or avoidance

oriented, variations in self-efficacy may moderate the relationship between discrepancy and psychological distress. For example, it may be the case that when self-efficacy is high, self-discrepancy is not as predictive of symptom severity than when self-efficacy is low, and individuals feel incapable of obtaining their goals through their own efforts. This may be a moderator of interest in future studies.

Finally, and as a more lofty future direction, the development of a measure that is capable of capturing self-discrepancy with the same level of accuracy as the Selves Questionnaire would facilitate more research on self-discrepancy as a self-regulatory process. The current measure used to assess this construct is idiographic in nature, and this is an important component of the Selves-Questionnaire as it allows for individuals to identify the unique and personally relevant attributes of their self-concept (Higgins, 1989). As the limitations of this measure have been discussed, a concise and efficient measure that is able to evaluate self-discrepancy with the same accuracy as the Selves-Questionnaire (or an accurate automated version of the Selves-Questionnaire) would allow for more frequent incorporation of self-discrepancy in psychology research, in turn furthering our understanding of the implications of self-discrepancy on psychological well-being.

Conclusion

In conclusion this study sought to develop a transdiagnostic model of self-regulation through the evaluation of self-discrepancy in the context of fear-and distress-based disorders. While a transdiagnostic model was successfully identified, with self-discrepancy predicting symptom severity across fear- and distress-based disorders, this model was unable to identify individual differences impacting this relationship. As such, a model was developed that accounted for multifinality, but not divergent trajectories. The current study was limited by the

sample and data collection modality, as well as by its cross-sectional nature. Future studies may aim to establish a similar model in both general population and clinical samples so as to enhance generalizability and clinical utility, respectively. Future studies may also seek to determine directionality within the relationship between self-discrepancy and fear-and distress-based disorders by utilizing longitudinal methodology. Findings from the current study have implications for our understanding of psychopathology and the transdiagnostic nature of self-regulatory processes, and may be meaningful in the context of intervention.

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Appendix A

Selves Questionnaire - modified (Higgins et al., 1985)***General Instructions:***

In the following questionnaire, you will be asked to list 6 attributes of the type of person you or a significant person in your life think you *actually*, *ideally*, and *ought* to be:

Definitions:

Actual self: Beliefs concerning the attributes you/other think you *actually* possess.

Ideal self: Beliefs concerning the attributes you/other would like *ideally* to possess; your/others ultimate goals for yourself.

Ought self: Beliefs concerning the attributes you believe you/other *should* or *ought* to possess; your/others normative rules or prescriptions for yourself.

Each page of the questionnaire focuses on a different domain and standpoint (i.e., actual: own, ideal: own, ought: own, ideal: other, and ought: other self-concepts are written about on 5 different pages).

Specific Instructions (examples):

Actual: own - “Please list 6 attributes of the type of person YOU think you ACTUALLY are”

Ought: other – “Please list 6 attributes of the type of person a SIGNIFICANT OTHER IN YOUR LIFE (e.g., mother, partner, etc.) believes you SHOULD or OUGHT to be”.

Appendix B

Center for Epidemiological Studies Depression Scale (CES-D Scale; Radloff, 1977)

Below is a list of some of the ways you may have felt or behaved. Please indicate how often you've felt this way during the **past week**. Respond to all items.

<u>During the past week...</u>	<u>Rarely or none of the time (less than 1 day)</u>	<u>Some or a little of the time (1-2 days)</u>	<u>Occasionally or a moderate amount of time (3-4 days)</u>	<u>All of the time (5-7 days)</u>
<u>1. I was bothered by things that don't usually bother me</u>				
<u>2. I did not feel like eating; my appetite was poor</u>				
<u>3. I felt that I could not shake off the blues even with help from my family</u>				
<u>4. I felt that I was just as good as other people</u>				
<u>5. I had trouble keeping my mind on what I was doing</u>				
<u>6. I felt depressed</u>				
<u>7. I felt that everything I did was an effort</u>				
<u>8. I felt hopeful about the future</u>				
<u>9. I thought my life had been a failure</u>				
<u>10. I felt fearful</u>				
<u>11. My sleep was restless</u>				
<u>12. I was happy</u>				
<u>13. I talked less than usual</u>				
<u>14. I felt lonely</u>				
<u>15. People were unfriendly</u>				
<u>16. I enjoyed life</u>				
<u>17. I had crying spells</u>				
<u>18. I felt sad</u>				
<u>19. I felt that people disliked me</u>				
<u>20. I could not "get going"</u>				

Appendix C

Generalized Anxiety Disorder Screener (GAD-7; Löwe et al., 2008)

Over the last 2 weeks, how often have you been bothered by the following problems?	Not at All	Several Days	More than half the days	Nearly everyday
1. Feeling nervous, anxious or on edge				
2. Not being able to stop or control worrying				
3. Worrying too much about different things				
4. Trouble relaxing				
5. Being so restless that it is hard to sit still				
6. Becoming easily annoyed or irritable				
7. Feeling afraid as if something awful might happen				

Appendix D

Panic Disorder Severity Scale (PDSS; Shear et al., 1997)

Several of the following questions refer to panic attacks and limited symptom attacks. For this questionnaire we define a panic attack as a sudden rush of fear or discomfort accompanied by at least 4 of the symptoms listed below. In order to qualify as a sudden rush, the symptoms must peak within 10 minutes. Episodes like panic attacks but having fewer than 4 of the listed symptoms are called limited symptom attacks. Here are the symptoms to count:

- Rapid or pounding heartbeat
- Sweating
- Trembling or shaking
- Breathlessness
- Feeling of choking
- Chest pain or discomfort
- Nausea
- Dizziness or faintness
- Feelings of unreality
- Chills or hot flushes
- Fear of losing control or going crazy
- Fear of dying
- Numbness or tingling

1. How many panic and limited symptom attacks did you have during the week?

- 0 No panic or limited symptom episodes
- 1 Mild: no full panic attacks and no more than 1 limited symptom attack/day
- 2 Moderate: 1 or 2 full panic attacks and/or multiple limited symptom attacks/day
- 3 Severe: more than 2 full attacks but not more than 1/day on average
- 4 Extreme: full panic attacks occurred more than once a day, more days than not

2. If you had any panic attacks during the past week, how distressing (uncomfortable, frightening) were they while they were happening? (If you had more than one, give an average rating. If you didn't have any panic attacks but did have limited symptom attacks, answer for the limited symptom attacks.)

- 0 Not at all distressing, or no panic or limited symptom attacks during the past week
- 1 Mildly distressing (not too intense)
- 2 Moderately distressing (intense, but still manageable)
- 3 Severely distressing (very intense)
- 4 Extremely distressing (extreme distress during all attacks)

3. During the past week, how much have you worried or felt anxious about when your next panic attack would occur or about fears related to the attacks (for example, that they could

mean you have physical or mental health problems or could cause you social embarrassment)?

- 0 Not at all
 - 1 Occasionally or only mildly
 - 2 Frequently or moderately
 - 3 Very often or to a very disturbing degree
 - 4 Nearly constantly and to a disabling extent
4. During the past week were there any places or situations (e.g., public transportation, movie theaters, crowds, bridges, tunnels, shopping malls, being alone) you avoided, or felt afraid of (uncomfortable in, wanted to avoid or leave), because of fear of having a panic attack? Are there any other situations that you would have avoided or been afraid of if they had come up during the week, for the same reason? If yes to either question, please rate your level of fear and avoidance this past week.
- 0 None: no fear or avoidance
 - 1 Mild: occasional fear and/or avoidance but I could usually confront or endure the situation. There was little or no modification of my lifestyle due to this.
 - 2 Moderate: noticeable fear and/or avoidance but still manageable. I avoided some situations, but I could confront them with a companion. There was some modification of my lifestyle because of this, but my overall functioning was not impaired.
 - 3 Severe: extensive avoidance. Substantial modification of my lifestyle was required to accommodate the avoidance making it difficult to manage usual activities.
 - 4 Extreme: pervasive disabling fear and/or avoidance. Extensive modification in my lifestyle was required such that important tasks were not performed.
5. During the past week, were there any activities (e.g., physical exertion, sexual relations, taking a hot shower or bath, drinking coffee, watching an exciting or scary movie) that you avoided, or felt afraid of (uncomfortable doing, wanted to avoid or stop), because they caused physical sensations like those you feel during panic attacks or that you were afraid might trigger a panic attack? Are there any other activities that you would have avoided or been afraid of if they had come up during the week for that reason? If yes to either question, please rate your level of fear and avoidance of those activities this past week.
- 0 No fear or avoidance of situations or activities because of distressing physical sensations
 - 1 Mild: occasional fear and/or avoidance, but usually I could confront or endure with little distress activities that cause physical sensations. There was little modification of my lifestyle due to this.
 - 2 Moderate: noticeable avoidance but still manageable. There was definite, but limited, modification of my lifestyle such that my overall functioning was not impaired.
 - 3 Severe: extensive avoidance. There was substantial modification of my lifestyle or interference in my functioning.

- 4 Extreme: pervasive and disabling avoidance. There was extensive modification in my lifestyle due to this such that important tasks or activities were not performed.
6. During the past week, how much did the above symptoms altogether (panic and limited symptom attacks, worry about attacks, and fear of situations and activities because of attacks) interfere with your ability to work or carry out your responsibilities at home? (If your work or home responsibilities were less than usual this past week, answer how you think you would have done if the responsibilities had been usual.)
- 0 No interference with work or home responsibilities
- 1 Slight interference with work or home responsibilities, but I could do nearly everything I could if I didn't have these problems.
- 2 Significant interference with work or home responsibilities, but I still could manage to do the things I needed to do.
- 3 Substantial impairment in work or home responsibilities; there were many important things I couldn't do because of these problems.
- 4 Extreme, incapacitating impairment such that I was essentially unable to manage any work or home responsibilities.
7. During the past week, how much did panic and limited symptom attacks, worry about attacks and fear of situations and activities because of attacks interfere with your social life? (If you didn't have many opportunities to socialize this past week, answer how you think you would have done if you did have opportunities.)
- 0 No interference
- 1 Slight interference with social activities, but I could do nearly everything I could if I didn't have these problems.
- 2 Significant interference with social activities but I could manage to do most things if I made the effort.
- 3 Substantial impairment in social activities; there are many social things I couldn't do because of these problems.
- 4 Extreme, incapacitating impairment, such that there was hardly anything social I could do.

Appendix E

Agoraphobic Cognitions Questionnaire (ACQ; Chambless et al., 1984)

Below are some thoughts or ideas that may pass through your mind when you are nervous or frightened. Please indicate how often each thought occurs when you are nervous. Rate from 1-5 using the scale below:

- 1 = thought never occurs
- 2 = thought rarely occurs
- 3 = thought occurs during half of the times
- 4 = thought usually occurs
- 5 = thought always occurs

... when I am nervous

Please rate all items:

- _____ I am going to throw up
- _____ I am going to pass out
- _____ I must have a brain tumor
- _____ I will have a heart attack
- _____ I will choke to death
- _____ I am going to act foolish
- _____ I am going blind
- _____ I will not be able to control myself
- _____ I will hurt someone
- _____ I am going to have a stroke
- _____ I am going crazy
- _____ I am going to scream
- _____ I am going to babble or talk funny
- _____ I am going to be paralyzed by fear

Appendix F

Social Phobia Inventory (SPIN; Connor et al., 2000)

Please indicate how much the following problems have bothered you during the past week. Mark only one answer for each problem and be sure to answer all items.

- 0 = Not at all
1 = A little bit
2 = Somewhat
3 = Very Much
4 = Extremely

- _____ 1. I am afraid of people in authority
- _____ 2. I am bothered by blushing in front of other people
- _____ 3. Parties and social events scare me
- _____ 4. I avoid talking to people I don't know
- _____ 5. Being criticized scares me a lot
- _____ 6. Fear of embarrassment causes me to avoid doing things or speaking to people
- _____ 7. Sweating in front of people causes me distress
- _____ 8. I avoid going to parties
- _____ 9. I avoid activities in which I am the center of attention
- _____ 10. Talking to strangers scares me
- _____ 11. I avoid having to give speeches
- _____ 12. I would do anything to avoid being criticized
- _____ 13. Heart palpitations bother me when I am around people
- _____ 14. I am afraid of doing things when people might be watching
- _____ 15. Being embarrassed or looking stupid is among my worst fears
- _____ 16. I avoid speaking to anyone in authority
- _____ 17. Trembling or shaking in front of others is distressing to me

Appendix G

Carver & White BIS/BAS Scales (Carver & White, 1994)

Each item of this questionnaire is a statement that a person may either agree or disagree with. For each item, indicate how much you agree or disagree with what the item says. Please respond to all the items; do not leave any blank. Choose only one response to each statement. Please be as accurate and honest as you can be. Respond to each item as if it were the only item. That is, don't worry about being "consistent" in your responses. Choose from the following four response options:

- 1 = very true for me
- 2 = somewhat true for me
- 3 = somewhat false for me
- 4 = very false for me

- _____ 1. A person's family is the most important thing in life
- _____ 2. Even if something bad is about to happen to me, I rarely experience fear or nervousness
- _____ 3. I go out of my way to get things I want
- _____ 4. When I'm doing well at something I love to keep at it
- _____ 5. I am always willing to try something new if I think it will be fun
- _____ 6. How I dress is important to me
- _____ 7. When I get something I want, I feel excited and energized
- _____ 8. Criticism or scolding hurts me quite a bit
- _____ 9. When I want something I usually go all-out to get it
- _____ 10. I will often do things for no other reason than that they might be fun
- _____ 11. It's hard for me to find the time to do things such as get a haircut
- _____ 12. If I see a chance to get something I want I move on it right away
- _____ 13. I feel pretty worried or upset when I think or know somebody is angry at me
- _____ 14. When I see an opportunity for something I like I get excited right away
- _____ 15. I often act on the spur of the moment
- _____ 16. If I think something unpleasant is going to happen I usually get pretty "worked up"
- _____ 17. I often wonder why people act the way they do
- _____ 18. When good things happen to me, it affects me strongly
- _____ 19. I feel worried when I think I have done poorly at something important
- _____ 20. I crave excitement and new sensations
- _____ 21. When I go after something I use a "no-holds-barred" approach
- _____ 22. I have very few fears compared to my friends
- _____ 23. It would excite me to win a contest
- _____ 24. I worry about making mistakes

Appendix H

Demographics Questionnaire

1. What is your age:
 - a. 18-24
 - b. 25-34
 - c. 35-44
 - d. 44-54
 - e. 55-64
 - f. 65 and older
2. Please identify your gender:
 - a. Female
 - b. Male
 - c. Transgendered
 - d. Other
3. Please identify your ethnic category:
 - a. Hispanic or Latino
 - b. Not Hispanic or Latino
4. Please identify your racial category:
 - a. American Indian/Alaska Native
 - b. Asian
 - c. Black/African-American
 - d. Native Hawaiian/Other Pacific Islander
 - e. White/Caucasian
 - f. More than one race
 - g. Other
5. Please indicate your annual household income:
 - a. Less than \$25,000
 - b. \$25,000 to \$34,000
 - c. \$35,000 to \$49,999
 - d. \$50,000 to \$74,999
 - e. \$75,000 to \$99,999
 - f. \$100,000 or more
6. Please indicate your highest level of education:
 - a. Some high school
 - b. High school graduate
 - c. Some college
 - d. Associate degree
 - e. Professional degree
 - f. Undergraduate degree
 - g. Graduate degree

7. What is your current relationship status:
- a. Single
 - b. Committed relationship
 - c. Married
 - d. Divorced
 - e. Separated
 - f. Widowed

Appendix I

Amazon's Mechanical Turk (MTurk). In order to collect information from a large and diverse sample, MTurk was used. Through this database, participants anonymously volunteer to participate in research studies in return for fiscal compensation. While in many typical research paradigms studies are often conducted with convenient undergraduate samples, utilizing a broader sample allows for research findings to be more representative of the general population, and in turn more generalizable. Research has been conducted on the quality of data emerging from online methods, and findings indicate that they are comparable to in vivo methods of data collection (Paolacci, Chandler, & Ipeirotis, 2010). With regard to MTurk specifically, research has shown that the sample found on this online database is more diverse than on other online databases (Buhrmester, Kwang, & Gosling, 2011). That is, across the approximate 100,000 MTurk users, individuals are more evenly split between genders (55% female), a greater percentage of participants are of non-White origin (36%), and participants are more diverse in age ($M = 32.8$, $SD = 11.5$) (Buhrmester et al., 2011). MTurk has also been demonstrated to be a relatively inexpensive means of data collection. Research has shown that across various levels of compensation (2, 10, and 50 cents), data quality remained high. This highlights the idea that individuals completing research on MTurk tend to have high intrinsic motivation to participate in research. Notably however, compensation amount and required time commitment have effects on participation recruitment, and speed of user completion (Buhrmester et al., 2011). Findings demonstrated that lower research participation occurs with lowest compensation paired with longer time commitments. While data collection is still possible under these conditions, manipulating these variables to be more favorable (i.e., increase compensation, decrease time commitment) increases speed of data collection (Buhrmester et al., 2011). A study investigating

how the manipulation of compensation and time commitment can alter data collection time found that a 30-minute long survey study was completed by 25 participants over a 5 hour span when offered 2 cents for completion. This study also found that data collection time decreased by 3 hours when compensation increased to 50-cents for completion (Buhrmester et al., 2011).

A recent study evaluated to utility of conducting psychological research within the MTurk community. This study examined the tendency for MTurk participants to endorse clinical and sub-clinical symptoms of psychopathology. Within this study, several measures of psychopathology were administered to 230 participants. These measures included the Depression Anxiety Stress Scale (DASS), the Dimensional Obsessive-Compulsive Scale (DOCS), the Eating Disorder Inventory (EDI), the Hoarding Rating Scale – Self Report (HRS-SR), and the Social Interaction Anxiety Scale (SIAS). Measures of cognitive vulnerability were also administered, including the Anxiety Sensitivity Index-3 (ASI-3), the Distress Tolerance Scale (DTS), the Intolerance of Uncertainty Scale (IUS), and the Ruminative Responses Scale (RRS; Arditte, Demet, Shaw, & Timpano, 2016) . Findings demonstrated that on average, MTurk participants displayed elevated cognitive vulnerabilities across domains compared to nonclinical samples, and reported clinically significant levels of depression and social anxiety. Mean scores on the SIAS and DASS-depression were significantly different from previous mean scores obtained using non-clinical samples, and were not significantly different from the mean scores obtained using a clinical sample. With regard to physiological symptoms of anxiety, measures on the DASS-anxiety were found to be in the subclinical range within the MTurk sample, indicating more symptoms (on average) than a non-clinical sample, and fewer than a clinical sample. Similarly, subclinical scores were observed on the EDI and HRS-SR. These results indicate that MTurk participants are more likely than a traditional community sample to present with a range

of psychological symptoms (Arditte et al., 2016). While this does speak to a significant difference between the general population and the MTurk community, it also highlights the ability to observe a wide range of psychological symptoms within this sample. Taking together the broad reach of MTurk, cost effectiveness of data collection, maintenance of data quality, and the ability to observe a range of psychological symptoms in this sample, this method is appropriate for use in the current study.

ISU research participation system (SONA). The ISU SONA system at Idaho State University (ISU) was also used for data collection. While the demographic variables of this sample vary from year to year, previous research studies using SONA participants reveal typical demographic information from this population. In a recent study conducted at Idaho State University, demographic information was taken from 948 participants. Of this sample, 68.1% identified as female, and 31.9% identified as male. With regard to ethnicity, 81% of the sample identified as Caucasian, 9.5% identified as Hispanic, 2.6% identified as Asian, 1% identified as Native American, and 5.8% identified as “Other”. The mean age of the participants was 24.05, with a standard deviation of 6.97 years (Letzring, Rone, & Colman, 2016). Professors of undergraduate psychology courses often encourage participation in research studies so that students may become familiar with the processes involved in psychological research. While some courses require a research participation component as a part of their curriculum, students are always given an option to complete another research related task (e.g., summarizing research articles), and the participation in research studies at ISU is entirely voluntary.