

THE CONSTRUCTS OF EMPATHY, MINDFULNESS, SELF-COMPASSION, AND
SELF-RUMINATION: AN EXPLORATORY FACTOR ANALYSIS

A Dissertation Presented to the
Faculty of the College of Education
University of Houston

In Partial Fulfillment
of the Requirements for the Degree

Doctor of Philosophy

by

Michael K. Ligocki

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Abstract

Previous research has demonstrated correlation amongst empathy, mindfulness, self-compassion and self-rumination. The constructs of empathy and mindfulness, however, remain indeterminate; self-compassion is a relatively new construct; and self-rumination has only recently been shown to correlate negatively with each construct. Evaluation of construct validity is required to draw conclusions about group differences and justify particular interpretations of test scores through explanations of the behaviors the test scores summarize. The primary research objective in this study will be to examine the underlying factor structure of measures of empathy, mindfulness, self-compassion and self-rumination. The purpose of this study is to examine whether the constructs are discrete, overlapping, redundant, or indistinguishable.

Three hundred forty-three participants were recruited from a large, ethnically diverse, Southwestern university (57 males and 286 females). The average age of the participants was 25 years of age ($M = 24.94$ years, $SD = 9.193$) with the youngest participant being 18 years old and the oldest participant being 62 years old. Participants' self-identified race was as follows: 38.2% White/Caucasian, 23.9% Asian/Pacific Islander, 16.9% African-American, 14.6% Hispanic, 3.2% biracial, 2.6% Middle Eastern, and .6% American-Indian. Participants completed a demographic questionnaire and one psychological measure that was constructed using all items from five existing measures: Interpersonal Reactivity Index (IRI; Davis, 1983), the Kentucky Inventory of Mindfulness Skills (KIMS; Baer, Smith, Allen, 2004), the Rumination subscale of the

Rumination-Reflection Questionnaire (RRQ; Trapnell and Campbell, 1999), the Self-Compassion Scale (SCS; Neff, 2003a), and the Marlowe-Crowne Social Desirability Scale (M-C) Short Form-C.

A series of principal-axis factor analyses with promax rotation ($k=4$) resulted in a comparison between 4-, 7-, and 12-factor solutions. 4-factor solution aligned with 34.1% of the overall variance. 7-factor solution aligned with 41.1% of the overall variance. 12-factor solution aligned with 48.2% of the overall variance. Overall, the 12-factor model was found to be the most interpretable, but not the most parsimonious. Across all factor solutions, the 12-factor model produced more consistency and strength across item-factor loadings, yielded the highest percentage of hyperplane counts (4-factor = 35.4%; 7-factor = 56.6%; 12-factor = 67.8%), provided good congruence with conceptually-derived organization of the measures under investigation, and accounted for the largest amount of variance. However, the 4-factor model was more parsimonious, indicated potential overlap/redundancy between constructs under investigation, and revealed that a higher-order factor may account for the several of the later factors within the 12-factor solution. These results confirm the need for future and ongoing study of these constructs and will hopefully lead to a more comprehensive understanding of empathy and mindfulness, two of the constructs that are core to the effectiveness of therapeutic work.

TABLE OF CONTENTS

<u>CHAPTER</u>	<u>PAGE</u>
I. Introduction	1
Research Questions	6
II. Review of the Literature	7
Empathy	7
Mindfulness	11
Self-compassion & Self-rumination	14
III. Methodology	17
Participants	17
Measures	17
Procedures & Analysis	22
IV. Results	28
V. Discussion	36
Limitations & Recommendations	41
Conclusion	43
References	58

LIST OF TABLES

<u>Table</u>	<u>Page</u>
1	45
2	46
3	51
4	52
5	57

CHAPTER I

INTRODUCTION

Psychotherapy has a storied history of fragmentation, a consequence of a proliferation of therapies over the past 30 years, each claiming to be differentially effective and distinctively applicable. Despite a wealth of efficacy research and a general acceptance that psychotherapy is effective (Smith, Glass, & Miller, 1980), reviews of outcome research continue to underscore an effective equivalence amongst most psychotherapeutic interventions (Lambert & Bergin, 1994; Luborsky, Singer & Luborsky, 1975; Luborsky et al., 2002; Wampold et al., 1997; Wampold 2001). As psychological theory and the technique of the therapist is estimated to account for only 12-15% of the variance across modalities (Lambert, 1992), researchers have begun to focus on common factors within therapy that span modality.

Although many factors of effective therapy have been studied, the most significant predictors of positive treatment outcome have been components of the therapeutic relations (Duncan & Miller, 2000). One such component that has received attention is the capacity to empathize with client experience (Greenberg, Elliott, Watson, & Bohart, 2001; Norcross, 2001; Pope & Kline, 1999; Rogers, 1957; Wampold, 2001; Watson, 2001). Empirical research has consistently shown a positive relation between therapist empathy and improved treatment outcome (Bohart & Greenberg, 1997; Horvath & Luborsky, 1993; Miller & Rollnick, 2002), leading some investigators to conclude that within the therapeutic context, empathy appears to “account for as much and probably more outcome variance than does specific intervention” (Bohart, Elliott, Greenberg & Watson, 2002, p. 96). Given that the capacity to empathize with client experience is

widely accepted as an essential element to effective therapy (Greenberg, Elliott, Watson, & Bohart, 2001; Norcross, 2001; Pope & Kline, 1999; Rogers, 1957; Wampold, 2001; Watson, 2001) and that empathy has been theorized to be as, if not more, important than theoretical orientation (Bohart, Elliott, Greenberg, & Watson, 2002), it is important to investigate further the construct of empathy.

The study of empathy is particularly challenging because the conflicting definitions, diverse conceptualizations, and inconclusive, sometimes contradictory, empirical findings surrounding the construct (Bohart & Greenberg, 1997; Duan & Hill, 1996; Gladstein, 1977, 1987). For example, empathy has been conceptualized and defined in the following ways: as a cognitive process, an emotional process, and as a combination of cognitive and affective phenomena, a relative potential, as a personality trait, a state, and an experiential process (Barrett-Lennard, 1962, 1981; Davis, 1983, 1994; Duan & Hill, 1996; Hoffman, 1984; Jordan, 1991; Mehrabian & Epstein, 1972; Rogers, 1957, 1975). Moreover, empathy is generally conceived as a multidimensional construct (Bohart & Greenberg, 1997; Davis, 1980; Duan & Hill, 1996), comprising a nexus of abilities that interact within relationships. These conflicting and complex conceptualizations have led to methodological issues in empirically studying the construct of empathy.

Although difficulties exist in accurately studying empathy from an empirical perspective, common threads can be found in the research to date that provide interesting future directions to consider in the continued study of empathy as a construct. Evidence suggests that qualities of mindfulness, in a manner similar to empathy, constitute a common factor in successful psychotherapy (Martin, 1997). Furthermore, mindfulness-

based interventions may prove to be powerful tools for cultivating therapeutic empathy (Fulton, 2005; Martin, 1997; Morgan & Morgan, 2005). Evidence also suggests that improved mindfulness in clients may correlate with improved mental health in various manifestations or diagnoses (Baer, 2003; Teasdale, Segal, & Williams, 2003), may be related specifically to empathy (Beitel, Ferrer, & Cecero, 2004; Shapiro, Schwartz, & Bonner, 1998), and may help establish core conditions for empathy (Baer, 2003; Lazar, 2005; Neff, 2003a; Shapiro, Astin, Bishop, & Cordova, 2005).

Unfortunately, the empirical research on mindfulness to date has suffered from many of the same challenges as the ones that have plagued empathy research. These challenges include conflicting definitions, such as varying dimensions of consciousness, awareness, attention, spirituality, and identity formation (Baer, 2003; Brown & Ryan, 2003; Hayes, Strosahl, & Wilson, 1999). As a result, mindfulness tends to be used in a variety of different contexts. More importantly, multiple literature reviews have acknowledged a continued disparity between various operationalizations of mindfulness within research protocols further highlighting the need for empirical consensus on the construct (Baer, 2003; Bishop, 2002).

Given that the current manifestations of mindfulness and empathy in the research literature continue to require operational clarification, coupled with the fact that each construct is considered an essential element supporting therapeutic efficacy across a variety of interdisciplinary domains, it seems imperative to examine more closely the elemental characteristics of each construct and to determine how, if at all, they may be related. At issue is not whether these inferred constructs are real, but rather how do these inferred constructs exist and relate within a nomological network (Cronbach & Meehl,

1955) and how might the interpretations of data be affected in accord with their theoretical underpinnings?

Rationale and Purpose

Despite a wealth of research that appears to evidence the clinical utility of empathy and growing support for the efficacy of mindfulness-based interventions, research has been fraught with methodological difficulties, including inconsistent assessment capabilities and continued debate about the operationalization of each construct (Baer, 2003; Duan & Hill, 1996). The lingering question therefore remains as to whether empathy and mindfulness represent unique and valid constructs that can be meaningfully distinguished from each other and additional related constructs.

Demonstrating the existence of a nomological network of relations with other variables through criterion-related validity, in addition to demonstrating discriminant and convergent validity using factor analysis, could help provide further evidence of validity for each of these constructs. Alternatively, this line of research may provide evidence suggesting a need to reexamine each one of these constructs, their according measures, or both.

The primary goal of the present research is to explore the construct validity of empathy, mindfulness and related constructs, as well as to examine the potential overlap and confounds between the underlying structures of these constructs. The notion of construct validity was first introduced in detail by Cronbach and Meehl (1955), who argued that the establishment of construct validity requires the demonstration of theoretically predictable relations between a measure of a given construct and measures of other constructs. Messick stated that "Validity is not a property of the test or

assessment as such, but rather of the meaning of the test scores" (Messick 1995, p. 741). With respect to the current investigation, the difficulty inherent throughout the research on empathy and mindfulness stems from interpretive confusion and the relevance of test score interpretation without full consideration for the theoretical context of implied relations to other constructs. Regarding value implications of construct relevance, Messick (1981) argued that "Contrasting . . . alternative trait theories, each with its own construct system and supporting data, would be theoretically challenging but not nearly as illuminating as confronting each conception with a range of data derived jointly from both, thereby disrupting the theory-dependence of prior data collection and analysis" (p. 581). As such, the general research question is as follows: Does each construct uniquely contribute to the prediction of theoretically contrived dimensions of each scale or do they differentially load across overlapping constructs?

In order to more fully examine the latent factor structures of empathy and mindfulness, measured by the Interpersonal Reactivity Index (IRI; Davis, 1983) and Kentucky Inventory of Mindfulness Skills (KIMS; Baer et al., 2003) respectively, measures of self-compassion (SCS; Neff, 2003), self-rumination (SRS; Trapnell & Campbell, 1999) and social desirability (MCSD-Form C; Reynolds, 1982) were included. Both self-compassion and self-rumination have recently been hypothesized to function as potential mechanisms of action with regard to the effects of mindfulness and empathy (Shapiro, Brown and Biegel, 2007; Joireman, 2004). Also, researchers have noted significant correlations between measures of mindfulness and social desirability (e.g., Baer et al., 2004; Brown & Ryan, 2003). With regard to Messick's (1989) unified framework of construct validity, the specific purpose of this study was to examine the

underlying factor structure of empathy, mindfulness, self-compassion, and self-rumination using a series of iterative principal axis factor analyses (PAF). An additional purpose of this study was to explore how individual differences such as gender and ethnicity influence the above constructs and relations. The general research questions to be addressed by this research are as follows: How well will resulting factor models represent the theoretical constructs of empathy, mindfulness, self-compassion, and self-rumination? What, if any, differences exist between item loadings and between factors from resulting factor models? Due to the exploratory nature of the current research, no specific hypotheses were ventured.

CHAPTER II

REVIEW OF THE LITERATURE

Empathy

In the past three decades, research has supported the notion that common factors, most notably the therapeutic relations, are agents of change within therapy (Lambert, 1992; Norcross, 2001). The common factor most often related to effective therapy and the therapeutic relations is empathy (Bozarth, 1997; Stubbs & Bozarth, 1994). Empathy is generally considered to be an essential component to psychotherapy and has been implicated in moral development (Hoffman, 1990), altruistic and prosocial behaviors (Eisenberg & Miller, 1987), successful social interactions (Davis, 1994), and within both the client-therapist relations (Bohart & Greenberg, 1997; Kohut, 1977; Rogers, 1957) and therapeutic alliance (Stricker & Gold, 1996). Moreover, research has demonstrated a positive relation between therapist empathy and improved treatment outcome (Duan & Hill, 1996; Greenberg, Watson, Elliot & Bohart, 2001; Horvath & Luborsky, 1993).

Theories of empathy vary widely and questions regarding empathy's underlying structure, operational definitions and mechanisms of action persist across psychological disciplines (Davis, 1994, Duan & Hill, 1996; Wispe, 1986). For example, one theory surmises that empathy is a biologically driven propensity linked to inherent survival and social mechanisms (Hoffman, 1981; Plutchik, 1987). Other theorists argue that empathy has origins in infancy (Hoffman, 1987; Sagi & Hoffman, 1976), may parallel the development of the self-concept (DesRosiers & Busch-Rossnagel, 1997) and is an essential component of satisfying mutual relationships (Ferber, 1995; Jordan, 1991). Furthermore, empathy has been implicated as a functional element in altruistic and

criminal behaviors (Batson & Shaw, 1991; Eisenberg & Fabes, 1990), seen as a coping skill or protective factor in reactions to stress (Feshbach, 1997; Work & Olsen, 1990) and conceived as a central element in the larger constructs of social and emotional intelligence (Mayer, DiPaolo, & Salovey, 1990; Goleman, 1995).

Conceptualizations of Empathy

Despite a number of empirical studies focused on empathy, the construct remains imprecise and theoretical conceptualizations of empathy remain varied. Empathy has been conceptualized as a personality trait (Davis, 1983; Mehrabian & Epstein, 1972), a state (Barrett-Lennard, 1962; Hoffman, 1984; Rogers, 1957) and an experiential process (Barrett-Lennard, 1981; Rogers, 1975). Theorists who refer to the construct as a personality trait (Davis, 1983; Mehrabian & Epstein, 1972) view empathy as an intrinsic, general ability that varies in strength across individuals (Batson & Shaw, 1991). Those who conceptualize empathy as a state construct (Barrett-Lennard, 1962; Hoffman, 1984; Rogers, 1959) view empathy as a situation-specific, dynamic cognitive-affective phenomena dependent upon a given context, regardless of one's developmental level (Duan & Hill, 1996). Theorists who conceptualize empathy as an experiential process (Barrett-Lennard, 1981, 1997; Rogers, 1975) interpret the construct as a state-contingent, multiphasic and dynamic process that requires an initial empathic resonance, awareness by the receiver of this experiential understanding, and communication that empathy has been received. Despite these widely varied conceptualizations and apparent incongruencies, there is a general acknowledgment that empathy contains both cognitive and affective components. Furthermore, it is widely agreed upon that the essential nature of the construct consists of the relations between the cognitive and affective dimensions

of empathy (Bohart and Greenberg, 1997; Baron-Cohen & Wheelwright, 2004; Davis et al., 1999; Duan and Hill, 1996).

Empirical Findings on Empathy

The general empirical findings on empathy have linked the construct with positive therapeutic outcome (Duan and Hill, 1996). One such study is that of Bohart, Elliott, Greenberg, and Watson (2002). Their meta-analysis consisted of 47 studies, 190 empathy-outcome tests and 3,026 clients involved primarily in individual therapy. Results indicated that empathy aligned with nearly 10% of the outcome variance with an effect size of .32, rivaling the outcome variance reported by Wampold (between 5-8%, 2001) in one of the original studies examining positive therapeutic outcome factors. Few studies, however, have addressed anything further than the relation between empathy and therapeutic outcome (Duan & Hill, 1996). Although empathy appears frequently in the empirical literature, few studies have focused specifically on researching the construct itself, perhaps due to the widely varying definitions and conceptualizations of the empathy. For example, Orlinsky, Grawe, and Parks (1994) reported that only five completed studies between 1985 and 1994 focused specifically on the construct of empathy. Duan and Hill (1996) further stated that per their literature review, only 11 studies examining the construct of empathy had been completed. The lack of empirical analysis of the nature of empathy and its properties is disconcerting, especially given that the construct is so frequently used in the psychological literature. Therefore, it seems important to examine more fully the nature of the construct to ensure its accurate use in future empirical research.

Measuring Empathy

Empirically researching empathy has been made difficult due to the varying conceptualizations of the construct and their reflective measures. For example, Hogan (1969) argued that empathy is generally a cognitive construct, whereas Mehrabian & Epstein (1972) surmised that empathy is best understood as an emotional component. In contrast, Davis (1980, 1983b, 1994) argued that empathy is likely comprised of both cognitive and affective components and should be measured using a multidimensional approach. Popular measures reflected these notions of empathy and include the Hogan Empathy Scale (HES; Hogan, 1969), the Questionnaire Measure of Emotional Empathy (QMEE; Mehrabian & Epstein, 1972) and the Interpersonal Reactivity Index (IRI; Davis, 1980).

Research using a multidimensional approach to empathy has been limited. Until Davis's (1980) multidimensional measure was developed, instruments to assess individual facets of empathy did not exist. Davis's multidimensional approach to measuring empathy appears to be the conceptualization that best captures the complexity of the construct reflected in the literature. Furthermore, the IRI is the most widely researched and comprehensive multidimensional assessment of empathy available (Cliffordson, 2002). Although the IRI remains the measure best able to capture the theoretical conflicts in the literature regarding the construct of empathy, the substantive validity of the instrument in relation to other, similar constructs has yet to be fully examined. Furthermore, the IRI continues to be used without full consideration for implications surrounding interpretability of data. In part, it is the intention of this study to examine more fully the construct validity of the IRI, with the hope of further validating the multidimensional approach to empirically researching empathy.

Mindfulness

Mindfulness, like empathy, is a construct that is not easily agreed upon or defined. Mindfulness is generally conceived as the process of learning how to be with all experiences in a moment-to-moment awareness, nonjudgmentally, through systematic, purposeful focusing (Kabat-Zinn, 1993). Aspects of mindfulness practice include self-reflection, acceptance and openness to difficulties without avoidance. It is believed that employing these aspects, one can promote present focus in an objective and compassionate way and facilitate development of inner resources to enhance self-efficacy and connectedness (Kabat-Zinn, 1993). Within this ideology, a striking similarity to empathy exists. As Gunaratana (2002) states,

Rather than noticing the differences between self and others, the meditator trains himself or herself to notice similarities. He centers his attention on those factors that are universal to all life, things that will move him closer to others. Thus, his comparison, if any, leads to feelings of kinship rather than feelings of estrangement. (p. 28)

Mindfulness has also been related to constructs describing consciousness and aspects of consciousness. For example, aspects of mindfulness have been related to emotional intelligence, a perceptual clarity of self, and other emotional states (Cherniss & Caplan, 2001; Mayer, Salovey, & Caruso, 2000). Also, the Openness to Experience dimension of personality (Costa & McCrae, 1992), which involves receptivity to and interest in new experiences (Brown & Ryan, 2003), appears to relate to aspects of mindfulness. As such, mindfulness, as viewed in present research, is more than

meditation. As Kabat-Zinn (2005) points out, meditation practice is merely a device or *scaffolding* used to develop the skill or attain a state of mindfulness.

Conceptualizations of Mindfulness

Mindfulness, like empathy, has suffered from varying operationalizations and conceptualizations (Baer, 2003; Brown & Ryan, 2003; Hayes, Strosahl, & Wilson, 1999). For example, mindfulness has been described as including dimensions of consciousness, awareness, attention, spirituality, and identity formation (Baer, 2003). Mindfulness is also described as a state or attribute of consciousness encompassing attention, awareness, and acceptance (e.g. Baer, 2003; Brown & Ryan, 2003; Hayes, Strosahl, & Wilson, 1999) and thus, often appears in the literature as interchangeable with these constructs. Although there is no agreed-upon definition for mindfulness, most Western conceptualizations within research literature have been adapted from Jon Kabat-Zinn (2003), who defines mindfulness as “the awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmentally to the unfolding of experience moment by moment” (p. 145).

Empirical Findings

Baer (2003), in a comprehensive review of mindfulness intervention literature, suggests that mindfulness is an effective component in treating a wide spectrum of emotional and psychiatric disorders. These include Generalized Anxiety Disorder and Panic Disorder (Miller, Fletcher, & Kabat-Zinn, 1995), anxiety in non-clinical populations under stress (Astin, 1997; Shapiro, Schwartz, & Bonner, 1998), various physical and mental health symptoms (Reibel, Greenson, Brainard, & Rosenzweig, 2001), and mood disturbances and stress symptoms in cancer patients (Specia, Carlson,

Goodey, & Angen, 2000). Other treatment programs with mindfulness components, such as Dialectical Behavior Therapy (DBT; Linehan, Armstrong, Suarez, et al., 1991), Acceptance and Commitment Therapy (ACT; Hayes, Strosahl & Wilson, 1999) and Mindfulness-Based Cognitive Therapy (MBCT; Segal, Teasdale, and Williams, 2002) have shown promise in the reduction of self-harm behaviors in Borderline Personality Disorder (Linehan, Armstrong, Suarez, et al., 1991), Obsessive-Compulsive Disorder (Schwartz, 1997, 1998), Binge-Eating Disorder (Kristeller, & Hallet, 1999) and the prevention of relapse in major depression (Ma & Teasdale, 2004; Teasdale, Segal, Williams, et al., 2000).

The mindfulness-based stress reduction program (MBSR; Kabat-Zinn, 1990) is the most widely researched mindfulness-based intervention to date. Enhancing the capacity for mindfulness provides the foundation for MBSR. Researchers believe that, through the consistent practice of mindfulness, including self-focused thoughts and emotions, tendencies that often lead to mental health problems will be reduced (Brown, Ryan, & Creswell, 2007). Intriguing findings in the research suggest that despite decreasing mindfulness practice over time, participants in mindfulness-based stress reduction programs maintain decreased symptomology (Baer, 2003). This trend underscores the ambiguity surrounding mechanisms of change within mindfulness-based interventions and lends credence for the investigation of alternative constructs that might better account for individual change within these interventions.

The existing body of literature on mindfulness research is not without criticism. In reviews of mindfulness literature, Bishop (2002) and Baer (2003) identified problematic methodological issues with current research. Baer (2003), for instance,

questioned the treatment integrity of many studies, due to inconsistent protocols, poor design, and a lack of post-hoc follow ups and analyses. Both Bishop (2002) and Baer (2003) further acknowledged the continued disparity between various operationalizations of mindfulness within research protocols. In sum, mindfulness and empathy research suffer similar problems that include inconsistent conceptualizations and poor research design.

Measuring Mindfulness

Several instruments for assessing mindfulness have recently become available including the Freiburg Mindfulness Inventory (FMI; Buchheld, Grossman, & Walach, 2001), the Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003), the Toronto Mindfulness Scale (TMS; Lau et al., 2006), the Cognitive and Affective Mindfulness Scale-Revised (CAMS-R; Feldman, Hayes, Kumar, & Greeson, 2007), and the Kentucky Inventory of Mindfulness Skills (KIMS; Baer, Smith, & Allen, 2004). Although there is general acceptance among researchers that mindfulness is a multifaceted construct (Dimidjian & Linehan 2003a, 2003b; Roemer & Orsillo, 2003), the KIMS (Baer, Smith, & Allen, 2004) is one of few multidimensional measures of mindfulness currently available.

Self-Compassion and Self-Rumination

To date, research has demonstrated a positive relation between empathy and positive therapeutic treatment outcomes (Duan & Hill, 1996; Greenberg, Watson, Elliot, & Bohart, 2001; Horvath & Luborsky, 1993). In addition, research further suggests that improved mindfulness facilitates a variety of well-being outcomes and positively correlates with improved mental health across a variety of diagnoses (Baer, 2003;

Teasdale, Segal & Williams, 2003). The link between the constructs of empathy and mindfulness has been further strengthened by recent studies that suggest increased mindfulness may enhance the capacity for empathy (Block-Lerner et al., 2007; Krasner et al., 2009; Shapiro & Izett, 2008; Shapiro, Schwartz, & Bonner, 1998). Given that current conceptualizations of mindfulness and empathy continue to require operational clarification, it is imperative to examine more closely the elemental characteristics of each construct and to determine how, if at all, they may be related.

In order to examine the constructs of empathy and mindfulness, this research will include an examination of two additional constructs, self-compassion and self-rumination. Previous researchers have hypothesized that these constructs are related to empathy and mindfulness and initial research has supported this theory. Although a full review of self-compassion and self-rumination is beyond the scope of this paper, a brief explanation of how these constructs relate to empathy and mindfulness is provided in order to justify their inclusion in this analysis.

Recent research has suggested that self-compassion is a foundation for the cultivation of empathy (Morgan & Morgan, 2005; Neff, 2003b). According to Neff (2003a), self-compassion involves “being open to and moved by one’s own suffering, experiencing feelings of caring and kindness toward oneself, taking an understanding, nonjudgmental attitude toward one’s inadequacies and failures, and recognizing that one’s experience is part of the common human experience” (p. 224). This definition bears striking resemblance to Barrett-Lennard’s (1997) and Jordan’s (1984) conception of *self-empathy*, which both consider a primary component of the empathic process. Neff, Kirkpatrick, and Rude (2007) found that increased self-compassion was associated with

less self-criticism, depression, anxiety, self-rumination, and thought suppression. These findings suggest that self-compassion may be an integral component of empathy, as well as produce positive mental health outcomes that parallel the benefits of mindfulness (Reibel, Greenson, Brainard, & Rosenzweig, 2001). However, few studies have explored the impact of mindfulness-based treatments on self-compassion (Abercrombie, Zamora, & Korn, 2007; Shapiro, Brown, & Biegel, 2007; Shapiro et al., 2005).

Self-compassion appears to be inversely connected with self-rumination (Neff, Kirkpatrick, & Rude, 2007). Trapnell and Campbell (1999) define self-rumination as a “neurotic category of self-attentiveness [characterized by] recurrent thinking or ruminations about the self-prompted by threats, losses, or injustices to the self” (p. 292). Rumination has been found to predict depressive disorders and anxiety symptoms and is generally associated with increased levels of depression and other forms of negative affect (Lam, Schuck, Smith, Farmer, & Checkley, 2003; Nolen-Hoeksema, 2000; Segerstrom, Tsao, Alden, & Craske, 2000). A propensity towards self-rumination likely has an impact on self-compassion, which in turn, according to recent research, likely has significant impact on empathic processes. This suggests that self-rumination may negatively influence empathic abilities. Additional research has suggested that mindfulness-based interventions help to reduce self-rumination, to increase self-compassion (Shapiro, Brown, & Biegel, 2007), and to increase empathy (Block-Lerner et al., 2007; Krasner et al., 2009; Shapiro & Izett, 2008). However, to date, the mechanisms of action in these relations remain undefined and few models of interaction have been forwarded.

Chapter III

Method

Participants

Three hundred forty-three participants were recruited from a large, ethnically diverse, Southwestern university (57 males and 286 females). The average age of the participants was 25 years of age ($M = 24.94$ years, $SD = 9.193$) with the youngest participant being 18 years old and the oldest participant being 62 years old. Twenty-six participants were in their first year of university, sixty-two participants were in their second year, ninety-eight participants were in their third year, ninety-three participants were in their fourth year, fifty participants were enrolled in a graduate program and fourteen participants were enrolled in post-graduate courses. Participants' self-identified race was as follows: 38.2% White/Caucasian, 23.9% Asian/Pacific Islander, 16.9% African-American, 14.6% Hispanic, 3.2% biracial, 2.6% Middle Eastern, and .6% American-Indian. Presentation of demographic information is found in Table 1.

Measures

Interpersonal Reactivity Index

The Interpersonal Reactivity Index (IRI; Davis, 1983) is a 28-item scale used to measure four dispositional aspects of empathy (seven items each) on a 5-point scale (1 = "Never or very rarely true"; 5 = "describes me very well"). Several items are reverse-scored and higher scores on the 5-point scale indicate higher empathy. Perspective-Taking (PT) is a cognitive aspect that measures the tendency to adopt the point of view of another (i.e. "I sometimes try to understand my friends better by imagining how things look from their perspective"). Empathic Concern (EC) measures the tendency to

experience "other oriented" feelings of warmth, compassion, and concern for another (i.e. "I often have tender concerned feelings for people less fortunate than me." Fantasy (FS) reflects the degree to which individuals respond empathically to the emotions or actions of fictitious characters or contexts (i.e. "After seeing a play or movie, I have felt as though I were one of the characters"). In contrast, the Personal Distress (PD) subscale measures "self-oriented" feelings of personal unease and discomfort in reaction to the emotions of others (i.e. "When I see someone who badly needs help in an emergency, I go to pieces.").

Subsequent studies (Carey, Fox, & Spraggins, 1988; Davis, 1983) have indicated good construct validity for the IRI's subscales. In addition, these subscales have been documented to have satisfactory internal reliabilities (range = .71 to .77) and test-retest reliabilities (range = .62 to .80) (Davis, 1980).

Exploratory factor analyses on the IRI yielded a four-factor solution that matched the four subscales (Davis, 1980). Subsequent researchers have conducted exploratory and confirmatory factor analyses yielding a 4-factor model corresponding to the above subscales (CFI = .65; RMSEA = .06) supporting the multidimensional nature of the IRI among samples from different racial/cultural groups (Siu & Shek, 2005). Other authors, however, have found evidence for a unidimensional structure of the IRI via confirmatory factor analyses ($\chi^2 = 1394$, $N = 137$) = 2067.56, $p < .00$; RMSEA = .060) Cliffordson, 2001).

Kentucky Inventory of Mindfulness Skills

The Kentucky Inventory of Mindfulness Skills (KIMS; Baer, Smith, & Allen, 2004) is a 39-item scale used to measure four dispositional aspects of mindfulness on a 5-

point scale (1 = “does not describe me well”; 5 = “Very often or always true”). Several items are reverse-scored and higher scores on the 5-point scale indicate greater mindfulness. Mindfulness is generally defined to include focusing one’s attention in a nonjudgmental or accepting the experience occurring in the present moment (Baer et al., 2004). The *observe* facet involves observing, noticing or attending to various stimuli including internal phenomena (cognitions, bodily sensations) and external phenomena (sounds, smells) (i.e. “I notice changes in my body, such as whether my breathing slows down or speeds up”). The *describe* facet involves participant describing, labeling, or noting of observed phenomena by applying words in a nonjudgmental way (i.e. “I’m good at finding the words to describe my feeling”). The *act with awareness* facet involves being attentive and engaging fully in one’s current activity (i.e. “When I do things, my mind wanders off and I’m easily distracted”). Finally, the *accept without judgment* facet involves the recognition and acceptance of present thoughts and feelings without judging, avoiding, changing, or escaping them (i.e. “I criticize myself for having irrational or inappropriate emotions”).

The KIMS has also been shown to be significantly positively correlated to other measures of mindfulness including the Mindful Attention Awareness Scale ($r = 0.51$; $p < .01$) (MAAS; Brown & Ryan, 2003), The Freiburg Mindfulness Inventory ($r = 0.57$; $p < .01$) (FMI; Buchheld, Grossman, & Walach, 2001), the Cognitive and Affective Mindfulness Scale ($r = 0.67$; $p < .01$) (CAMS; Feldman, Hayes, Kumar, & Greeson, 2004) and the Mindfulness Questionnaire ($r = 0.55$; $p < .01$) (MQ; Chadwick, Hember, Mead, Lilley, & Dagnan, 2005).

Exploratory and confirmatory factor analyses supported a 4-factor model corresponding to the above subscales ($CFI = .95$; $RMSEA = .07$), with a 1-factor model showing poor fit ($CFI = .41$, $RMSEA = .22$) (Baer et al., 2004). However, in a later study using several new mindfulness measures including the KIMS, Baer and colleagues (2006) concluded that a 5-factor model may better represent the mindfulness construct. Results from their 2006 study supported three original factors from the KIMS (Describe, Act with awareness, and accept without judgment), but showed mixed results for the Observe facet.

Self-Compassion Scale

The 26-item Self-Compassion Scale (SCS; Neff, 2003a) includes six subscales: Self-Kindness items (5 items, i.e. “I try to be understanding and patient towards those aspects of my personality I don't like”), Self-Judgment (5 items, i.e. “I’m disapproving and judgmental about my own flaws and inadequacies”), Common Humanity (4 items, i.e. “I try to see my failings as part of the human condition”), Isolation (4 items, i.e. “When I think about my inadequacies it tends to make me feel more separate and cut off from the rest of the world”), Mindfulness (4 items, i.e. “When something painful happens I try to take a balanced view of the situation”), and Over-Identification (4 items, i.e. “When I’m feeling down I tend to obsess and fixate on everything that’s wrong.”). Responses are given on a 5-point scale (1 = “Almost Never”; 5 = “Almost Always.”). Several items are reverse-scored and higher scores on the 5-point scale indicate higher self-compassion.

Research indicates the SCS demonstrates concurrent validity (e.g., correlates with social connectedness), convergent validity (SCS scores are significantly correlated with

therapist ratings of self-compassion), discriminate validity (e.g., no correlation with social desirability or narcissism), and that the SCS has excellent test-retest reliability (Neff, 2003a; Neff, Kirkpatrick & Rude, 2007).

Exploratory and confirmatory factor analyses by Neff (2003) supported a 2-factor model (NNFI=.88; CFI=.91) and a 6-factor model (NNFI=.90; CFI=.91; corresponding to the above 6 subscales), with a 1-factor model showing poor fit (NNFI=.80; CFI=.84). In the same study, however, a single higher-order factor of self-compassion showed a marginal fit to the data (NNFI = .88, CFI = .90). Subsequent research has provided some evidence to support the unidimensionality of the SCS (GFI = 0.692; RMSEA = 0.123)(Deniz, Kesici, & Sümer, 2008).

Rumination-Reflection Questionnaire (RRQ) - Rumination Subscale.

The Rumination-Reflection Questionnaire (RRQ; Trapnell & Campbell, 1999) rumination subscale is the primary assessment instrument used to measure rumination. This 12-item rumination subscale measures “ruminative self-attention,” the tendency to dwell on, rehash, or reevaluate events or experiences. Several items are reverse-scored and higher scores on the 5-point scale indicate higher rumination. The rumination scale consists of negatively toned rumination items ($\alpha = .88$) that reflect the trait of neuroticism and share a focus on neurotic self-attentiveness (Siegle, Moore, & Thase, 2004). An example item is, “My attention is often focused on aspects of myself I wish I’d stop thinking about.”

Trapnell and Campbell (1999) found the RRQ to demonstrate good convergent and discriminant validity. The measure demonstrated strong internal consistency, with

alpha estimates exceeding .90, and the mean inter-item correlation exceeding .40 (Trapnell & Campbell, 1999).

Marlowe-Crown Social Desirability Scale Short-form

This questionnaire is a 13-item, true-false, short form of the original M-C scale (Form C; Reynolds, 1982), which is used to assess socially desirable responding. Several items are reverse-scored and higher scores indicate higher social desirability. Attaining information on participants' bias toward answering in a socially desirable manner is particularly important for the current study due to the value-laden nature of each construct and their related interpersonal expectancies, often determined by situational characteristics. The measures that will be used in this study include straightforward questions about concepts, values and behaviors (e.g. mindfulness, empathy, self-compassion, and self-rumination) that may be judged as desirable or undesirable by participants. Therefore, it is possible that participants may answer questions in a way that would reflect a perceived belief system in accord with their community rather than endorsing items that more accurately reflect personal beliefs and behaviors.

Procedures

All items from the Interpersonal Reactivity Index (IRI; Davis, 1983), the Self-Compassion Scale (SCS; Neff, 2003a), the Kentucky Inventory of Mindfulness Skills (KIMS; Baer, Smith, Allen, 2004), Rumination subscale of the Rumination-Reflection Questionnaire (RRQ; Trapnell and Campbell, 1999), Marlowe-Crown Social Desirability Scale Short-form (Form C; Reynolds, 1982) were placed into a composite questionnaire. A brief demographic index was included at the beginning of the questionnaire. The composite questionnaire was subsequently input into Survey Monkey to create an on-line

survey and a unique hyperlink to access the survey. Survey Monkey is an online website used specifically to create surveys and gather data in a fast and efficient manner.

Participants were recruited using the SONA system - a website that allows enrolled students to voluntarily sign up for experiments (both lab studies and online studies) in return for extra credit. Prior to participation, eligible participants were given a brief description of the study and asked to provide informed consent that included explicit reminders that names and identifying information (excluding demographic characteristics) will not be requested, statistics will be completed and reported in group format, that participation is voluntary and may be ended at any point, and that opportunity will be granted, prior to and concluding the study, to participants who request additional information or debriefing.

Participants were required to have a general proficiency using computers, adequate internet accessibility, and English language fluency in order to participate. All students admitted to the university have access to multiple computer centers and all students are required to provide proof of English proficiency in order to attend the university.

Analysis

The Statistical Package for the Social Sciences, Version 17.0 (SPSS) was used to store and analyze data. Prior to conducting the analyses, data were inspected for normality, excessive missing cases, and outliers. Unrestricted and restricted (i.e., forced solution) principal-axis factor analyses (PAF) were conducted using several criteria to determine factor extraction: Kaiser's criterion of eigenvalues greater than 1 (Kaiser, 1974), Cattell's scree test (Cattell, 1966), Horn's parallel analysis (Horn, 1965) and the

percentage of variance explained between the items, both in general and with regard to each factor.

Exploratory factor analysis (EFA) was chosen in order to examine factor structure for several reasons. First, theoretical and empirical evidence suggests that the measures under investigation may be measuring similar latent factor(s) thereby calling into question construct validity. Second, although confirmatory factor analysis can show *what* items are loading on the same factor, it does not show if the factor is measuring the intended construct. Equally important is the tendency of a components analysis to homogenize the loadings for a construct when the actual pattern is varied. Furthermore, when the data correspond to assumptions of the common factor model, EFA produces more accurate results than PCA (Snook & Gorsuch, 1989; Widaman, 1990, 1993). Finally, Fabrigar et al. (1999) concluded that EFA is superior to confirmatory factor analysis (CFA) if there is uncertainty in the evidence for the number of common factors and for the relations between measured variables and latent structure. Byrne (1994) also indicate that EFA is designed for the situation where links between the observed and latent variables are unknown or uncertain.

Principal-axis factor analysis was chosen, as opposed to principal components analysis, to determine the least number of factors that can account for common variance while taking into account the covariation among the variables. A theoretical model of latent factors underlying variables can subsequently be created and compared to principal factors with the factor structure of each of the constructs under examination (e.g. predicted observed variables from theoretical latent factors do/do not match). Since principal axis factoring generally provides more interpretable solutions, variables that are

typically linked to only one factor, and the ability for pattern and structure matrices to be examined for cross-loadings that suggest poorer construct validity, PAF was chosen as the primary extraction method. However, because a major shortcoming of PAF is factor indeterminacy (Velicer and Jackson, 1990) which may cause substantially different factor interpretations to be obtained from the same original data, a principal components analysis was also conducted during initial factor extraction as comparison. In this study, the solutions found through principal axis factoring are similar in form to those found by principal component analysis, thus factor indeterminacy is not likely to be a problem in this study.

Criteria for factor extraction was determined by assessing Kaiser's criterion of eigenvalues greater than 1 (Kaiser, 1974), Cattell's scree test (Cattell, 1966), parallel analysis (Horn, 1965) and the percentage of variance shared, both in general and with regard to each factor. Parallel analyses provide an independent analysis of the correct number of higher order dimensions or factors in a dataset. Parallel analysis is based on a comparison of eigenvalues obtained from sample data to expected eigenvalues from completely random data (i.e., the predicted means of eigenvalues produced by repeated sets of random data). In the present study, the procedure was repeated 500 times to ensure a stable result. Gorsuch (1983) suggests that if there is doubt concerning the correct number of factors, the researcher should err on the side of selecting too many rather than too few factors. Hair et al. (1995) suggest a cut-off point where the last factor accounts for only a small portion of the shared variance (less than 5%). However, when strong common factors are present in data, studies indicate that the scree test functions reasonably well (Cattell & Vogelmann, 1977; Hakstian et al., 1982).

To simplify and clarify the data structure, an oblique rotation method was chosen. This rotation derives factor loadings based on the assumption that the factors are correlated and it can provide more meaningful theoretical factors (Netemeyer, Bearden, & Sharma, 2003). To determine the best choice of rotation, Tabachnick and Fidell (2007) argue that if correlations amongst factors exceed .32 within the factor correlation matrix there is enough evidence to warrant oblique rotations. As moderate correlations were produced between several factors following the initial extraction, the oblique solution was retained. Correlation matrices instead of covariance matrices were computed to take account of scaling differences between the items (Hair et al., 1998) and the internal consistency of each factor was calculated.

Finally, each factor solution was then assessed by the percent of variance each factor represents after rotation, factor loadings from both the pattern and structure matrices, and the percentage of nonredundant residuals from reproduced correlation matrices. Also, approximation to simple structure criteria (Thurstone, 1947) of the resultant factor pattern solutions was assessed in terms of the corresponding ± 0.10 hyperplane counts, as recommended by Cattell (1952). The hyperplane count is primarily defined as the number of variables with an absolute loading ≤ 0.10 and is used as a simple parameter to compare factor solutions.

Empirical and conceptual considerations guided factor interpretation. Factor pattern coefficients exceeding .3 or .4 are often considered meaningful (Floyd & Widaman, 1995). Further, Tabachnick & Fidell, (2001) argue that only variables with a loading of .32 and above should be interpreted. In this study, coefficients exceeding .32

were considered meaningful because it indicated that at least 10.24% of an item's variance is due to the underlying factor.

CHAPTER IV

RESULTS

Data Screening

Suitability of data for factor analysis was assessed first. Examination of the correlation matrix revealed the presence of many coefficients of .3 and above. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was .87, exceeding the recommended value of .6 (Kaiser, 1974), and Bartlett's Test of Sphericity (Bartlett, 1954) was significant ($\chi^2 = 20337.27$, $df = 5253$, $p < .001$) supporting the factorability of the correlation matrix. Generally, small values of the KMO statistic (less than 0.5) indicate that the correlations between pairs of variables cannot be explained by other variables and that factor analysis may not be appropriate. Bartlett's test of Sphericity tests the null hypothesis that in the population the correlation matrix for the outcome variables is an identity matrix (where each variable correlates perfectly with itself ($r = 1$) but has no correlation with the other variables ($r = 0$)). Values from the KMO and Bartlett's Test of Sphericity indicate that factor analysis is appropriate.

Factor Analyses

The unrestricted factor analysis in both the PAF and PCA produced a 23-factor solution with eigenvalues greater than one, which recovered 66.8% of the sample variance. However, examination of eigenvalues and the Cattell's scree test (Cattell, 1966) revealed a marked gap between the first four factors and the remaining factors (Factor 1 eigenvalue = 16.8, Factor 2 eigenvalue = 11.8, Factor 3 eigenvalue = 4.86; Factor 4 eigenvalue = 4.17; the first four factors aligned with 36.6% of the total variation across factors). An additional gap on the scree plot appeared between the 7th factor and

the remaining factors, leaving two discrete groups of 4 and 7 factors respectively.

Complicating interpretation, the parallel analysis did not correspond with either Kaiser's criterion or Cattell's scree test, estimating that 12 factors should be extracted. A number of studies and reviews have argued that the best empirical method for factor retention in FA is parallel analysis (Patil, Singh, Mishra, & Todd Donovan, 2008; Pallant, 2007; Hayton, Allen, & Scarpello, 2004). Based on these initial results, it was decided that several principal factor analyses with promax rotation ($k=4$) will be run to evaluate four-, seven-, and twelve-factor solutions.

Varimax (orthogonal) and Promax (oblique) rotations were performed across the series of analyses. Results from the oblique rotations were preferred for two reasons: (a) it seemed reasonable to assume that the underlying constructs would be correlated, and (b) if the factors were independent from one another, this would be indicated by trivial factor correlations (Floyd & Widaman, 1995).

Four-Factor Solution

Using the pattern matrix for interpretation, four factors aligned with 34.09% of the overall variance (see Table 2 for full pattern matrix). Forty-five items loaded onto factor 1 (values ranged from .305 to .756; $\alpha = .947$) and aligned with 15.78% of the variance. The items generally reflected critical self-monitoring indicative of rumination, negative self-talk, and difficulty controlling attention. Twenty-five items loaded onto factor 2 (values ranged from .332 to .630; $\alpha = .887$) and aligned with 10.82% of the variance. These items generally reflected integrated self-awareness indicative of intentional awareness to present sensory and emotional experience and ability to control attention. Eighteen items loaded onto factor 3 (values ranged from .353 to .651; $\alpha =$

.900) and aligned with 4.09% of the variance. These items generally reflected self-compassion indicative of self-kindness, positive self-talk, and acceptance. Eleven items loaded onto factor 4 (values ranged from .339 to .600; $\alpha = .390$) and aligned with 3.40% of the variance. These items generally reflected lower levels of empathy indicative of difficulty identifying with others and difficulty managing emotional content.

Correlations between factors were low to moderate and ranged from -.062 to .418 (see Table 3).

Fourteen items cross-loaded onto two separate factors (values ranged from .301 to .390) and four items did not load within the solution. Communalities estimates and hyperplane proportion (35.4%) for the four-factor solution were considerably lower than the 7- and 12-factor solutions and ranged from .038 to .591. Although the communalities estimates and hyperplane proportions were inferior to the other solutions, the determination of highly accurate communalities is not as important as it is with very small factor matrices (Nunnally, 1978) and hyperplane proportions are typically reduced as fewer factors are extracted. There were 1618 (30%) nonredundant residuals with absolute values greater than .05. Tabachnick and Fidell (2001) suggest that the presence of moderate (.05-.10) or large residuals (>.10) may indicate that there may be more factors remaining to be extracted. These findings, combined with numerous low item communalities, are suggestive that the four extracted factors may not represent a good fit for the data.

Seven-Factor Solution

Using the pattern matrix for interpretation, seven factors aligned with 41.07% of the overall variance. Thirty items loaded onto factor 1 (values ranged from .304 to .837;

$\alpha = .950$) and aligned with 15.83% of the variance. Similar to the 4-factor solution, items generally reflected critical self-monitoring indicative of rumination, negative self-talk, and self-judgment. Sixteen items loaded onto factor 2 (values ranged from .376 to .808; $\alpha = .566$) and aligned with 10.88% of the variance. Again similar to the 4-factor solution, items generally reflected integrated self-awareness indicative of intentional awareness to present sensory and emotional experience and ability to control attention. Thirteen items loaded onto factor 3 (values ranged from .450 to .803; $\alpha = .504$) and aligned with 4.16% of the variance. Items in this factor corresponded perfectly to the items SCS subscales of self-kindness, common humanity, and mindfulness. Twelve items loaded onto factor 4 (values ranged from .311 to .700; $\alpha = .399$) and aligned with 3.40% of the variance. These items generally reflected difficulty describing and experiencing emotional experiences. Fifteen items loaded onto Factor 5 (values ranged from .317 to .606; $\alpha = .528$) and aligned with 2.21% of the variance. These items generally reflected other-oriented empathy and intention to take another's perspective. Nine items loaded onto Factor 6 (values ranged from .388 to .628; $\alpha = .499$) and aligned with 2.46% of the variance. This factor contained many (but not all) of the items originally assigned to the KIMS Acting with Awareness subscale (described as being attentive and engaging fully in one's current activity). Six items loaded onto Factor 7 (values ranged from .433 to .572; $\alpha = .412$) and aligned with 2.07% of the variance. This factor contained all but one of the items originally assigned to the IRI Fantasy subscale (described as a tendency to imagine the feelings and actions of fictional figures, such as those found in books or movies). Correlations between factors were low to moderate and ranged from .021 to .442.

Fifteen items cross-loaded onto two separate factors (values ranged from .302 to .459) and two items did not load within the solution. Communality estimates and hyperplane proportion (56.6%) for the seven-factor solution were higher than the four-factor solution, but considerably lower than the 12-factor solutions ranging from .095 to .607. There were 1085 (20%) nonredundant residuals with absolute values greater than .05. Again, these findings, combined with several low item communalities, are suggestive that the seven extracted factors may not represent a good fit for the data. Because the 7-factor model was neither the most interpretable nor the most parsimonious, it was not considered for further analysis.

12-Factor Solution

Using the pattern matrix for interpretation, twelve factors aligned with 48.21% of the rotated common factor variance (see Table 4). Fifteen items loaded onto factor 1 (values ranged from .339 to .882; $\alpha = .925$) and aligned with 15.90% of the variance. Items in this factor corresponded perfectly to the SCS subscales of self-judgment, isolation, and over-identified. Thirteen items loaded onto factor 2 (values ranged from .368 to .803; $\alpha = .895$) and aligned with 10.94% of the variance. Items in this factor corresponded perfectly to the SCS subscales of self-kindness, common humanity, and mindfulness. Eleven items loaded onto factor 3 (values ranged from .301 to .846; $\alpha = .860$) and aligned with 4.23% of the variance. All but one of the items in this factor matched the KIMS observing subscale. Nine items loaded onto factor 4 (values ranged from .307 to .716; $\alpha = .363$) and aligned with 3.53% of the variance. All but one of the items in this factor matched the KIMS describing subscale. Seven items loaded onto factor 5 (values ranged from .561 to .833; $\alpha = .891$) and aligned with 2.52% of the

variance. All but one of the items in this factor matched the KIMS accepting subscale. Eight items loaded onto factor 6 (values ranged from .483 to .818; $\alpha = .914$) and aligned with 2.30% of the variance. All but one of the items in this factor matched the Self-rumination subscale. Six items loaded onto factor 7 (values ranged from .433 to .669; $\alpha =$ negative average covariance) and aligned with 2.14% of the variance. All but one of the items in this factor matched the IRI empathic concern subscale. Seven items loaded onto factor 8 (values ranged from .359 to .678; $\alpha = .760$) and aligned with 1.67% of the variance. All but one of the items in this factor matched the KIMS acting with awareness subscale. Six items loaded onto factor 9 (values ranged from .365 to .766; $\alpha = .275$) and aligned with 1.48% of the variance. All the items in this factor matched the IRI personal distress subscale. Six items loaded onto factor 10 (values ranged from .307 to .716; $\alpha = .412$) and aligned with 1.37% of the variance. All items in this factor matched the IRI fantasy subscale. Four items loaded onto factor 11 (values ranged from .681 to .732; $\alpha = .753$) and aligned with 1.10% of the variance. All items in this factor matched the KIMS acting with awareness subscale. Seven items loaded onto factor 12 (values ranged from .378 to .695; $\alpha = .443$) and aligned with 1.04% of the variance. All items in this factor matched the IRI perspective-taking subscale. Table 4 shows that most of the factors are virtually identical to those identified in the development of their respective measures. A noteworthy finding was that the KIMS subscale *acting with awareness* split into two separate factors (see Table 4 for subscale-item breakdown).

Eight items loaded on two separate factors (values ranged from .306 to .445) and four items did not load within the solution. Communality estimates and hyperplane proportion (67.8%) for 12-factor solution were higher than the 4- and 7-factor solutions

ranging from .244 to .697. There were 464 (8%) nonredundant residuals with absolute values greater than .05. This result, combined with respectable item communalities, is suggestive that the twelve extracted factors represent a reasonably good fit for the data. Correlations between factors were low to moderately high and ranged from -.005 to .611 (see Table 5).

In order to investigate if the items would align more closely with the factors in a higher-dimensional space, the degree of simple structure in 4-, 7-, and 12-factor models were compared to simulated models that extracted 1 factor less and 1 factor more than the solutions examined above. The results revealed that although simple structure was attributable to the number of extracted factors (up to 12 factors), the explained variance of these factors decreased with an increase of factor extraction. A final series factor analyses was performed to examine the impact of low-loading items and cross-loading items on the overall factor structure for the 4-, 7-, and 12-factor models. After item removal, results did not reveal any significant changes. Although there were several small increases ($\sim .05$) in factor loadings and explained variance ($<1\%$), these differences were negligible and the original factor structures were retained without further investigation.

Social Desirability

Social desirability, or a socially desirable response style, measured by the MCDS-C, was also examined as a possible confound. In order to ensure that social desirability bias did not taint scoring on either measure, a Pearson's correlation coefficient was calculated and found to be nonsignificant between the MCDS-C scale and the KIMS ($r=-.114$, $p=.32$), the IRI ($r=-.04$, $p=.70$), the RRQ ($r=-.182$, $p=.08$), and the SRS ($r=-.164$,

$p=.116$) with no significant differences between groups. This indicated that socially desirable response style was unlikely to account for the relations between the variables of interest.

CHAPTER V

DISCUSSION

Cronbach and Meehl (1955) argued that in order to provide evidence of construct validity for a measure, a nomological network has to be developed for its measure. This study was intended to contribute to the ongoing evidence in support of a nomological set as it pertains to two primary constructs: empathy and mindfulness. The focus of this study was to examine the factor structure of these theoretically related psychological constructs and to determine whether these constructs are discrete or indistinguishable. Partially consistent with the prediction that the factor structure of each measure will not be adequately supported, results did not indicate one clear-cut structure model; but rather demonstrated several alternative factor solutions. The various differing factor solutions suggest that dimensions of these constructs may be overlapping, may be measuring a similar primary factor, and/or may be measuring a higher-order factor; however, due to the nature of this study and the a priori decisions made by the researcher, additional study is warranted in order to better understand how the factor structure of each construct varies in the presence of related constructs.

Evidence from the present research provides some support for the originally derived factor structures of empathy (Davis, 1983), mindfulness (Baer et al., 2004), self-compassion (Neff, 2003a), and self-rumination (Trapnell & Campbell, 1999). Overall, the 12-factor model was found to be the most interpretable, but not the most parsimonious. Across all factor solutions, the 12-factor model produced more consistency and strength across item-factor loadings, yielded the highest hyperplane proportions (4-factor = 35.4%; 7-factor = 56.6%; 12-factor = 67.8%), provided strong

congruence with conceptually-derived organization of the measures under investigation, and aligned with the largest amount of variance. Table 4 shows that most of the factors are essentially identical to those identified in the development of their respective measures. However, the later factors in the 12-factor solution aligned with significantly reduced and perhaps even trivial proportions of the common factor variance in the data. For instance, the first two factors in the 12-factor solution aligned with more variance than the final 10 factors combined. Further, correlations amongst factors increased as the number of extracted factors increased, suggesting potential redundancy amongst extracted factors.

This leads to a quandary regarding interpretation and meaningfulness of the 12-factor model demonstrated in this study. Notably, Factor 1 was highly correlated with Factor 5 (.611), Factor 6 (.600) and moderately correlated with Factor 8 (.425) and Factor 9 (.404). From an interpretive standpoint, this would suggest that the negative dimension of self-compassion (Factor 1) may be measuring similar items or dimensions as the KIMS *Accepting* subscale (Factor 5) and self-rumination (Factor 6). Although this finding may be demonstrative of reasonable convergent validity (e.g. self-criticism equates to self-rumination, each theoretically the opposite of self-acceptance), it may be extremely difficult to separate the effect of these different factors if, for example, a future study were to examine potential mediation/moderation amongst these dimensions. In particular, regression coefficients indicate the effect of one factor may change when some other factor is added or removed from the model. Without adequate discrimination between factors, effect variance becomes suspect, at best.

Highlighting this complexity, similar correlations were found between Factor 2 (SCS positive self-compassion) and Factors 3 (.403; KIMS Observing) and 11 (.399; KIMS Acting with Awareness), Factor 3 (KIMS Observing) and Factors 9 (.490; IRI Personal Distress) and 11 (.473; KIMS Acting with Awareness), Factor 4 (KIMS Describing) and Factor 8 (-.476; KIMS Acting with Awareness), and between Factor 5 (KIMS Accepting) and Factors 6 (.489; RRQ Self-rumination) and 9 (.482; IRI Personal Distress). This evidence leads to the possibility that a more stable, global latent variable may better explain the combined variance of several factors, thus representing a higher-order factor such as Factor 1 found in the 4-factor model. This theory is supported by Thurstone (1947) who argued for a second-order factor conceptualization: "...a general second-order factor is likely to be of more fundamental significance for the domain in question than a general orthogonal first-order factor," because the second-order factor is a "participant in the definition of the other [lower-order] factors" (p. 418). As such, the results of this study generate additional questions and hypotheses regarding the nature of these constructs and the relations between them. Further, it remains possible that the correlations between and among variables may be better explained by the presence of second order factors.

Despite the challenges associated with the interpretation of the 12-factor model, the results do generally echo findings made during these measures' development. However, since the 4-factor model was more parsimonious, it is possible that some of these subscales (namely the negative dimensions of self-compassion, the *accepting without judgment*, and *self-rumination*) may combine to measure second-order factors that better explain the high inter-correlations between them. This appears to be borne out

upon inspection of the 4- and 12-factor pattern matrices. For example, within the 4-factor model, item loadings in factor 2 generally correspond to mindfulness as a single factor, item loadings in factor 3 correspond to the positive dimension of self-compassion, and item loadings in factor 4 generally encompasses empathy. As more factors are extracted through subsequent analyses (e.g. 12-factor model), we begin to see each factor from the 4-factor model deconstructed into subcomponents that closely reflect the subscales from their respective measures. This evidence provides an interesting conundrum, wherein the results seem to support both unidimensional and multidimensional factor derivations found in the literature.

A notable observation across each of the factor solutions is that the first factor in each solution is comprised of items that can be generally defined as self-judgment or self-criticism. There appear to be at least two possible interpretations of this finding. First, in the given population, respondents may have given greater attention to negatively worded items creating response bias, consequently calling into question criterion and discriminant validity of the constructs under investigation. This would suggest that items may need to be reworded or reworked altogether to become more discriminant. Second, the confluence of items from the different measures loading onto factor 1 (4-factor model) may actually be measuring a higher-order latent construct; in this case generally defined by this researcher as self-judgment/criticism. Theoretically, this appears to make sense. For instance, in the 12-factor model, self-rumination (Factor 6), the inability to accept one's feelings without judgment (Factor 5) and self-judgment (Factor 1) seem to be essentially the same qualities. Taken further, because self-compassion is theorized to function as an emotion regulation strategy (Neff, 2007), it seems reasonable to theorize

that self-compassion may exist as a second-order factor that negotiates the occurrence and fluidity of empathy and mindfulness by buffering self-judgment/criticism. These findings are partially consistent with results from Neff (2003b) who found that scores of self-judgment items decreased and scores of self-kindness items increased as mindfulness experience increased. Further, several studies have indicated higher average self-compassion scores and lower self-judgment scores in a comparison between meditators and non-meditators (Neff, 2003b; Shapiro et al., 2005). An alternative consequence may be that the measures of empathy and mindfulness, for example, may become less sensitive to the latent/manifest occurrence of each construct when simultaneously measuring self-compassion, and thereby diluting explained variance within a given data set. This possibility seems to parallel Batson et al. (2002) who have questioned whether empathy can be measured validly via self-report methodology.

Following inconsistency of results for empathy and mindfulness, results indicated inconsistency with the original factor structure of the SCS, with results from this study consistently demonstrating a 2-factor solution across multiple analyses, as opposed to both the suggested 6-factor and 1-factor higher-order models reported by Neff (2003). This result has several implications. First, it may suggest that the factor structures of empathy, mindfulness, self-compassion, and self-rumination may become variable when measured simultaneously and/or factor structures may shift in dynamic ways according to greater-lesser presence of other constructs. Second, factor structures of the constructs represented in this study may be hierarchically ordered. Relative to previous research findings, these associations may suggest that increases in self-compassion and decreases in self-judgment may be mechanisms of change through which mindfulness practice

produces the positive outcomes found in mindfulness studies (Shapiro, Astin, Bishop, & Cordova, 2005; Shapiro, Schwartz, & Bonner, 1998). Or they may provide evidence of state/trait differences that the current instruments cannot discriminate. These implications suggest a need for further investigation.

On a more practical level, the present findings highlight the possibility that mindfulness and empathy are primarily context-dependent traits and that each construct may need to be primed in order to better examine their influence and structure. An intriguing alternative possibility is that self-judgment/criticism may have heuristic value and precedence (e.g. social psychology) relative to the other factors within this population. It may therefore be interesting to examine hierarchical contributions of each factor to determine priority of factor functioning between manifest and latent presentations. This appears to merit additional study within and between independent samples. Careful theoretical analysis and further study of the relation of empathy and mindfulness dimensions to external variables could prove enlightening regarding the nature of each construct and the respective instruments.

Limitations and Recommendations

One limitation of this study is its reliance on self-report questionnaires, especially those administered at a single point in time. Participants could be unable or unwilling to accurately assess themselves, or find themselves in a particular mood on the day they completed the survey that influences their response set, both of which could confound the results. Recommendations to remedy these problems include using multiple, different means of measuring constructs. For instance, utilizing different types of instruments measuring a construct may be especially helpful if the similarities and differences among

the measures are known (e.g., self-report, third-person report, observation, lab tasks, etc.). Using these varied measurement techniques at different times could also help alleviate the problem of a response set reflective of a “bad day” or other such time specific factors that could influence results. Additionally, within the self-report measures, each of the factors could probably be strengthened through the revision (rewriting) of items with lower primary loadings and possibly adding new items.

An additional limitation of this study is that because EFA is an internally driven procedure, results may be sample specific (Costello & Osborne, 2005). As such, these results cannot be widely generalized. The current study was designed to specifically investigate only factor structure and is consequently limited to data generated by this specific population and the included instruments. Further, the results noted in this study may not adequately represent the desired constructs on a broader, more global level and therefore caution should be taken in their interpretation. Additionally, the current sample came from a large public university in a large metropolitan city, which calls into question the demographic nature of the sample and may not represent broader population means in terms of religion, ethnicity, social class, and culture. A component of this sample that was not examined, but may contribute variance, is developmental level, level of education, and major focus of study. No individuals without at least some college education were surveyed. As such, results gained from this sample may not take into consideration the impact that intelligence and/or social class may have on empathy, mindfulness, self-compassion, and self-rumination. Finally, as with most EFA's, sample size plays a large part in the factoring process. Although this study found five or more strongly loading items (.50 or better) per factor per solution indicating a solid factor

(Costello & Osborne, 2005, p. 5), the subject-to-variable ratio was relatively low (3.3:1) and consequently may not have been large enough to produce correct solutions. Because the relations between variables and factors are often complex, it is imperative that future studies using these constructs together depict these complexities.

Conclusion

The current study suggests that constructs of empathy and mindfulness may be significantly correlated and may share a number of dimensions that are used theoretically to define each construct. Consequently, instruments used to measure these constructs might include items that are redundant and cross-load onto different factors within a specific factor model, thereby potentially clouding results. Further, results appear to affirm a necessity to more carefully consider the interplay between factor structures of differing constructs when examining intercorrelations and effect patterns between constructs. As for the construct validity of empathy and mindfulness, this study suggests potential interaction between first and second-order factors both between and within constructs. Due to the measurement difficulties in this study, as well as the measurement difficulties inherent with exploratory factor analysis, it is worth exploring whether the findings of this study will hold with replication. If we can better understand the ways that empathy and mindfulness connect and overlap, this knowledge can contribute to more effective clinical psychological practice and to the development of increasingly refined measures. With respect to the information gleaned from this study, a possible future direction might include further examination of the self-judgment/criticism factor uncovered in the 4-factor solution and consideration for potential scale development from subsequent examinations of this factor. Despite the complexities of the analysis of this

study, it is hoped that the results confirm the need for future and ongoing study of these constructs. Understanding of empirically supported facets of empathy and mindfulness may provide suggestions to clinicians about how to best cultivate these constructs using different treatments. Perhaps the notion of including first and second order factors in further studies will lead to a more comprehensive understanding of empathy and mindfulness, two of the constructs that are core to the effectiveness of therapeutic work, and add to ongoing examination of nomological nets for each construct.

Table 1

Sample Statistics for Gender, Ethnicity, and Year in School (N = 343)

Demographic	N	%
Gender		
Male	57	16.6
Female	286	83.4
Ethnicity		
Caucasian	131	38.2
Asian/Pacific Islander	82	23.9
African-American	58	16.9
Hispanic/Latino	50	14.6
Other/Mixed	11	3.2
Middle Eastern	9	2.6
American Indian	2	0.6
Year in School		
Freshman	26	7.6
Sophomore	62	18.1
Junior	98	28.6
Senior	93	27.1
Other	64	18.7

Table 2

4-Factor Pattern Matrix of Combined Items From IRI, KIMS, SCS, SRS in Sample of 343 Students

<i>Source of Item and Content</i>		<i>Factor Loading</i>			
		1	2	3	4
RRQ-8	Sometimes it is hard for me to shut off thoughts about my faults.	.756			
RRQ-4	I tend to dwell over unpleasant things that happen to me for a long time afterwards.	.741			
SCS-1	I'm disapproving and judgmental about my own flaws and inadequacies.	.739			
RRQ-3	My attention is often focused on aspects of myself I wish I'd stop thinking about.	.738			
SCS-2	When I'm feeling down I tend to obsess and fixate on everything that's wrong.	.712			
RRQ-9	I often reflect on unfavorable outcomes in my life.	.706			
RRQ-2	I spend a great deal of time thinking back over my embarrassing or disappointing moments.	.698			
SCS-6	When I fail at something important to me I become consumed by feelings of inadequacy.	.696			
SCS-16	When I see aspects of myself that I don't like, I get down on myself.	.696			
SCS-4	When I think about my inadequacies, it tends to make me feel more separate and cut off from the rest of the world.	.676			
RRQ-5	Long after an argument or disagreement is over, my thoughts keep going back to what happened.	.648			
RRQ-10	I often find myself re-evaluating something I have done wrong.	.639			
RRQ-6	Often I'm playing back over in my mind how I acted in an embarrassing situation.	.631			
SCS-20	When something upsets me I get carried away with my feelings.	.629			
SCS-25	When I fail at something that's important to me, I tend to feel alone in my failure.	.628			
SCS-11	I'm intolerant and impatient towards those aspects of my personality I don't like.	.597			
SCS-8	When times are really difficult, I tend to be tough on myself.	.583			
SCS-21	I can be a bit cold-hearted towards myself when I'm experiencing suffering.	.570			
KIMS-28	I tell myself that I shouldn't be thinking the way I'm thinking	.548			.316
KIMS-12	I tell myself that I shouldn't be feeling the way I'm feeling	.546			
SCS-13	When I'm feeling down, I tend to feel like most other people are probably happier than I am.	.544			
KIMS-4	I criticize myself for having irrational or inappropriate emotions	.541			
KIMS-16	I believe some of my thoughts are abnormal or bad and I shouldn't think that way	.534			.363
KIMS-32	I think some of my emotions are bad or inappropriate and I shouldn't feel them	.532			.361

Table 2 (continued)

4-Factor Pattern Matrix of Combined Items From IRI, KIMS, SCS, SRS in Sample of 343 Students

<i>Source of Item and Content</i>		<i>Factor Loading</i>			
		1	2	3	4
RRQ-7	I often analyze my mistakes.	.531			
IRI-17	Being in a tense emotional situation scares me.	.521			
KIMS-36	I disapprove of myself when I have irrational ideas	.517			
SCS-18	When I'm really struggling, I tend to feel like other people must be having an easier time of it.	.514			
SCS-24	When something painful happens I tend to blow the incident out of proportion.	.501			
IRI-1	I daydream and fantasize, with some regularity, about things that might happen to me.	.484			
KIMS-23	I don't pay attention to what I'm doing because I'm daydreaming, worrying, or otherwise distracted	.478			
KIMS-3	When I do things, my mind wanders off and I'm easily distracted	.452			
IRI-10	I sometimes feel helpless when I am in the middle of a very emotional situation.	.446			
KIMS-18	I have trouble thinking of the right words to express how I feel about things	.442			.341
IRI-26	When I am reading an interesting story or novel, I imagine how I would feel if the events in the story were happening to me.	.427			
IRI-16	After seeing a play or movie, I have felt as though I were one of the characters.	.426			
KIMS-22	When I have a sensation in my body, it's difficult for me to describe it because I can't find the right words	.416			.380
IRI-24	I tend to lose control during emergencies.	.408			.334
KIMS-35	When working on something, part of my mind is occupied with other topics (what I'll be doing later, things I'd rather be doing).	.388			
KIMS-24	I tend to make judgments about how worthwhile or worthless my experiences are	.387	.348		
IRI-27	When I see someone who badly needs help in an emergency, I go to pieces.	.375			
RRQ-1	It is easy for me to put unwanted thoughts out of mind.	-.338			
IRI-23	When I watch a good movie, I can very easily put myself in the place of a leading character.	.327			
IRI-6	In emergency situations, I feel apprehensive and ill-at-ease.	.315			
IRI-5	I really get involved with the feelings of the characters in a novel.	.305			
*KIMS-27	When I'm doing chores, such as cleaning or laundry, I tend to daydream or think of other things				
*KIMS-31	I tend to do several things at once rather than focusing on one thing at a time				
KIMS-10	I'm good at thinking of words to express my perceptions, such as how things taste, smell, or sound		.630		

Table 2 (continued)

4-Factor Pattern Matrix of Combined Items From IRI, KIMS, SCS, SRS in Sample of 343 Students

<i>Source of Item and Content</i>		<i>Factor Loading</i>			
		1	2	3	4
KIMS-34	My natural tendency is to put my experiences into words		.591		
KIMS-37	I pay attention to how my emotions affect my thoughts and behavior		.587		
KIMS-5	I pay attention to whether my muscles are tense or relaxed		.586		
KIMS-25	I pay attention to sounds, such as clocks ticking, birds chirping, or cars passing		.570		
KIMS-1	I notice changes in my body, such as whether my breathing slows down or speeds up		.557		
KIMS-2	I'm good at finding the words to describe my feelings	-.306	.557		
KIMS-30	I intentionally stay aware of my feelings		.550		
KIMS-21	I pay attention to sensations, such as the wind in my hair or sun on my face		.550		
KIMS-6	I can easily put my beliefs, opinions, and expectations into words	-.309	.547		
KIMS-9	I often reflect on unfavorable outcomes in my life.		.533		
KIMS-17	I notice how foods and drinks affect my thoughts, bodily sensations, and emotions		.514		
KIMS-39	I notice when my moods begin to change		.491		
KIMS-26	Even when I'm feeling terribly upset, I can find a way to put it into words		.478		
KIMS-33	I notice visual elements in art or nature, such as colors, shapes, textures, or patterns of light and shadow		.464		
KIMS-8	I tend to evaluate whether my perceptions are right or wrong		.446		
KIMS-38	I get SCSletely absorbed in what I'm doing, so that all my attention is focused on it		.445		
KIMS-20	I make judgments about whether my thoughts are good or bad	.369	.440		
KIMS-13	When I take a shower or bath, I stay alert to the sensations of water on my body		.436		
KIMS-29	I notice the smells and aromas of things		.424		
KIMS-7	When I'm doing something, I'm only focused on what I'm doing, nothing else		.411		
KIMS-19	When I do things, I get totally wrapped up in them and don't think about anything else		.406		
KIMS-15	When I'm reading, I focus all my attention on what I'm reading		.351		
IRI-13	When I see someone get hurt, I tend to remain calm.		.339		
IRI-19	I am usually pretty effective in dealing with emergencies.		.332		

Table 2 (continued)

4-Factor Pattern Matrix of Combined Items From IRI, KIMS, SCS, SRS in Sample of 343 Students

<i>Source of Item and Content</i>		<i>Factor Loading</i>			
		1	2	3	4
*KIMS-11	I drive on “automatic pilot” without paying attention to what I’m doing				
SCS-12	When I’m going through a very hard time, I give myself the caring and tenderness I need.			.651	
SCS-15	I try to see my failings as part of the human condition.			.648	
SCS-26	I try to be understanding and patient towards those aspects of my personality I don't like.			.617	
SCS-7	When I'm down and out, I remind myself that there are lots of other people in the world feeling like I am.			.606	
SCS-19	I’m kind to myself when I’m experiencing suffering.	-.301		.598	
SCS-22	When I'm feeling down I try to approach my feelings with curiosity and openness.			.591	
SCS-14	When something painful happens I try to take a balanced view of the situation.			.588	
SCS-10	When I feel inadequate in some way, I try to remind myself that feelings of inadequacy are shared by most people.			.570	
SCS-17	When I fail at something important to me I try to keep things in perspective.			.546	
SCS-5	I try to be loving towards myself when I’m feeling emotional pain.			.545	
SCS-23	I’m tolerant of my own flaws and inadequacies.			.528	
SCS-3	When things are going badly for me, I see the difficulties as part of life that everyone goes through.			.511	
IRI-25	When I'm upset at someone, I usually try to "put myself in his shoes" for a while.			.471	
IRI-28	Before criticizing somebody, I try to imagine how I would feel if I were in their place.			.470	
SCS-9	When something upsets me I try to keep my emotions in balance.			.415	
IRI-21	I believe that there are two sides to every question and try to look at them both.			.393	
IRI-11	I sometimes try to understand my friends better by imagining how things look from their perspective.			.374	-.313
IRI-8	I try to look at everybody's side of a disagreement before I make a decision.			.353	
IRI-14	Other people's misfortunes do not usually disturb me a great deal.				.600
IRI-18	When I see someone being treated unfairly, I sometimes don't feel very much pity for them.				.585
IRI-4	Sometimes I don't feel very sorry for other people when they are having problems.				.519
IRI-12	Becoming extremely involved in a good book or movie is somewhat rare for me.				.475

Table 2 (continued)

4-Factor Pattern Matrix of Combined Items From IRI, KIMS, SCS, SRS in Sample of 343 Students

<i>Source of Item and Content</i>		<i>Factor Loading</i>			
		1	2	3	4
IRI-3	I sometimes find it difficult to see things from the "other guy's" point of view.				.457
KIMS-14	It's hard for me to find the words to describe what I'm thinking	.390			.457
IRI-7	I am usually objective when I watch a movie or play, and I don't often get SCSletely caught up in it.				.435
IRI-20	I am often quite touched by things that I see happen.				-.395
IRI-2	I often have tender, concerned feelings for people less fortunate than me.				-.362
IRI-22	I would describe myself as a pretty soft-hearted person.			.312	-.352
IRI-9	When I see someone being taken advantage of, I feel kind of protective towards them.				-.339
*IRI-15	If I'm sure I'm right about something, I don't waste much time listening to other people's arguments.				
<i>Initial eigenvalues for each factor</i>		16.84	11.80	4.86	4.17
<i>Percentage of variance aligned with after extraction</i>		15.78	10.82	4.09	3.40

Note: IRI = Interpersonal Reactivity Index; KIMS = Kentucky Inventory of Mindfulness Skills; SCS = Self-Compassion Scale; RRQ = Rumination-Reflection Questionnaire – Rumination Subscale

*Items loading <.3 across all factors

Table 3

Factor Correlation Matrix for 4-Factor Model

<i>Factor</i>	1	2	3	4
1	1.000			
2	-.224	1.000		
3	.169	.403	1.000	
4	-.334	.322	.255	1.000

[illegible]

Table 4 (continued)

12-Factor Pattern Matrix of Combined Items From IRI, KIMS, SCS, SRS (n = 343)

<i>Source of Item</i>	<i>Factor Loading</i>											
	1	2	3	4	5	6	7	8	9	10	11	12
SCS-22		.587										
SCS-23		.557										
SCS-3		.525										
SCS-9		.368										
*RRQ-1												
KIMS-21			.846									
KIMS-9			.773									
KIMS-25			.694									
KIMS-33			.673									
KIMS-5			.631									
KIMS-1			.612									
KIMS-13			.592									
KIMS-17			.589									
KIMS-29			.474									
KIMS-37			.326									
KIMS-39			.301									
*KIMS-8												
KIMS-2				.716								
KIMS-18				-.712								
KIMS-10				.710								
KIMS-6				.624								
KIMS-14				-.620								
KIMS-26				.609								
KIMS-22				-.586								

Table 4 (continued)

12-Factor Pattern Matrix of Combined Items From IRI, KIMS, SCS, SRS (n = 343)

<i>Source of Item</i>	<i>Factor Loading</i>											
	1	2	3	4	5	6	7	8	9	10	11	12
KIMS-34				.579								
KIMS-30			.306	.307								
KIMS-28					.833							
KIMS-32					.825							
KIMS-16					.780							
KIMS-12					.702							
KIMS-4					.665							
KIMS-20					.570							
KIMS-36					.561							
*KIMS-24												
RRQ-6						.818						
RRQ-7						.777						
RRQ-10						.688						
RRQ-5						.657						
RRQ-9						.637						
RRQ-2						.573						
RRQ-8						.572						
RRQ-4						.483						
IRI-18							-.669					
IRI-14							-.666					
IRI-4							-.574				.308	
IRI-2							.547					
IRI-20							.451					
IRI-9							.433					

Table 4 (continued)

12-Factor Pattern Matrix of Combined Items From IRI, KIMS, SCS, SRS (n = 343)

<i>Source of Item</i>	<i>Factor Loading</i>											
	1	2	3	4	5	6	7	8	9	10	11	12
*IRI-22												
KIMS-35								.678			-.387	
KIMS-23								.641				
KIMS-27								.639				
KIMS-31								.599			-.339	
KIMS-3								.550				
KIMS-11								.534				
IRI-1								.359				
IRI-24									.766			
IRI-19									-.656			
IRI-6									.640			
IRI-27									.638			
IRI-13							-.445		-.471			
IRI-17	.315								.365			
IRI-23										.724		
IRI-16										.706		
IRI-26										.534		
IRI-5										.533		
IRI-12										-.489		
IRI-7										-.384		
KIMS-38											.732	
KIMS-19											.712	
KIMS-15											.682	
KIMS-7								-.331			.681	

Table 4 (continued)

12-Factor Pattern Matrix of Combined Items From IRI, KIMS, SCS, SRS (n = 343)

<i>Source of Item</i>	<i>Factor Loading</i>											
	1	2	3	4	5	6	7	8	9	10	11	12
IRI-25												.695
IRI-28												.579
IRI-3												-.508
IRI-21												.421
IRI-11												.420
IRI-15												-.386
IRI-8												.378
<i>Initial eigen-values</i>	16.83	11.80	4.86	4.17	3.12	2.87	2.72	2.19	2.06	1.90	1.64	1.58
<i>Percent variance after extraction</i>	15.90	10.94	4.23	3.53	2.52	2.30	2.14	1.67	1.48	1.37	1.09	1.04

Note: ^a IRI = Interpersonal Reactivity Index; KIMS = Kentucky Inventory of Mindfulness Skills; SCS = Self-Compassion Scale; RRQ = Rumination-Reflection Questionnaire – Rumination Subscale. ^b Acting with Awareness subscale (KIMS) items include: 3, 7, 11, 15, 19, 23, 27, 31, 35, 38

*Items loading <.3 across all factors

Table 5

Factor Correlation Matrix for 12-Factor Model

<i>Factor</i>	1	2	3	4	5	6	7	8	9	10	11	12
1	1.000											
2	-.224	1.000										
3	.169	.403	1.000									
4	-.334	.322	.255	1.000								
5	.611	-.098	.320	-.305	1.000							
6	.600	-.057	.236	-.076	.489	1.000						
7	.036	.249	.213	.308	-.072	.249	1.000					
8	.425	-.133	-.016	-.476	.365	.199	-.127	1.000				
9	.404	.253	.490	-.005	.402	.368	.261	.127	1.000			
10	.195	-.039	.105	.011	.036	.238	.151	.134	.110	1.000		
11	.028	.399	.473	.300	.127	.134	.255	-.148	.275	-.005	1.000	
12	-.038	.358	.326	.184	.052	.163	.308	-.235	.226	.046	.319	1.000

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