DIFFERENTIATION OF SELF INVENTORY –SHORT FORM: CREATION AND

INITIAL EVIDENCE OF CONSTRUCT VALIDITY.

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by
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ABSTRACT

This study sought to retain the structure and reliability of the four subscales of the Differentiation of Self Inventory - Revised yet make the instrument more efficient by reducing the total number of items within each subscale. The graded response model was applied to data collected from a sample of college students (n = 355) that was primarily Caucasian (73%), and female (55%). The scale items were chosen based on the item characteristic curves of the graded response model and on the individual item content. A second study provided supportive evidence of concurrent criterion validity for the Differentiation of Self - Short Form, demonstrating relationships with symptoms of depression, state anxiety, trait anxiety, perceived stress, and self-esteem. As expected, the Differentiation of Self - Short Form was positively related to self-esteem and negatively related to symptoms of depression, state anxiety, trait anxiety, and perceived stress. Evidence of convergent validity was supported through a positive relationship between the subscales of the Differentiation of Self Inventory –Short Form and the Level of Differentiation of Self

Scale. The Differentiation of Self - Short Form was shown in Study 2 to be more efficient than the Differentiation of Self – Revised. The Emotional Control subscale retained 98% of the internal consistency of the full version subscale with 25% of the items; Emotional Reactivity subscale retained 95% of the internal consistency of the full version subscale with 55% of the items; Fusion with Others subscale retained 92% of the internal consistency of the full version subscale with 50% of the items; and the I-Position subscale retained 97% of the internal consistency of the full version subscale with 45% of the items. The full scale score of the Differentiation of Self - Short Form performed similarly retaining 99% of the internal consistency of the full version full scale score with 43% of the items. Finally, in Study 3, preliminary estimates of four-week test-retest reliabilities were established. The test-retest reliabilities ranged from .72 (Fusion with Others subscale) to .85 (Differentiation of Self - Short Form Full Scale). The use of the DSI-SF is recommended in research applications.

APPROVAL PAGE

The faculty listed below, appointed by the Dean of the School of Education, have

examined a dissertation titled "Differentiation of Self Inventory –Short Form: Creation and

Initial Evidence of Construct Validity," presented by Joseph Rico Drake, candidate for the

Doctor of Philosophy degree, and certify that in their opinion it is worthy of acceptance.

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CONTENTS

LIST OF ILLUSTRATIONS

LIST OF TABLES

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To Autumn, Sebastian, and Wesley …

CHAPTER 1

INTRODUCTION

Differentiation of self is a complex amalgamation of emotional maturity, ability to

think rationally in the midst of an emotional situation, and the ability to maintain close

emotional relationships (Bowen, 1978; Kerr & Bowen, 1988). The construct is thought to be

related to psychological functioning, psychological distress, and to more specific constructs

such as stress, anxiety, and depression (Bowen, 1978; Kerr & Bowen, 1988).

Differentiation of self has been studied intensely as a central construct in Bowen's

family system theory. Traditionally, differentiation of self has been measured primarily by

one of four instruments: the *Differentiation of Self Inventory* (DSI; Skowron & Friedlander,

1998; DSI-R; Skowron & Schmitt, 2003), the *Differentiation in the Family System Scale*

(DIFS; Anderson & Sabatelli, 1992), The *Level of Differentiation of Self Scale* (LDSS;

Haber, 2003), and the *Chabot Emotional Differentiation Scale* (CEDS; Licht & Chabot,

2006). Miller, Anderson, and Keala (2004) indicate that the LDSS and the DSI are the two

scales that are most often used to assess differentiation of self.

The DSI and its derivatives have been used extensively to study differentiation of self

because of the multiple facets that it assessed and psychometric properties (Licht & Chabot,

2006; Miller et al. 2004). Despite the empirical support for the DSI-R it can be cumbersome

to use in research and clinical situations due to the length of the instrument. The DSI-R

consists of 46 items and takes approximately 10-15 minutes to complete. In a research setting

this can be a significant limiting factor in determining what other instruments can be included

in the study. In addition, reducing the number of items in the differentiation of self could be

effective in increasing the willingness of people to participate in the study. In a clinical setting, using 10 to 15 minutes to complete an instrument may be a significant portion of a therapy hour. In addition to the time requirements of the 46 item scale I believed that there was significant redundancy in the items within each subscale. The redundancy in items may be inflating the reliability estimates of the subscales and not increasing the ability of the subscales to discriminate between levels of differentiation of self. Thus, I believed that there was significant redundancy built into the scales of the DSI-R and I hypothesized that using fewer items per scale could create a more efficient scale that still retained good psychometric properties.

This manuscript is a presentation of three distinct studies that were used in order to create the DSI-Short Form (DSI-SF), assess the structure, reliability, and validity of the DSI-SF, and then establish a preliminary test-retest reliability coefficient for the DSI-SF. In Study 1 Samejima's (1969; 1997) Graded Response Model (GRM) was used to construct DSI-SF. During Study 2 the DSI-SF was assessed for construct validity, criterion validity, and reliability through correlational analysis. Then, in Study 3, the four week test-retest reliability of the DSI-SF was established. The methods and results for each study are presented individually and then discussed collectively. A more thorough examination of differentiation of self and the related constructs is presented below, however, before discussing the individual studies.

Differentiation of Self from the Family of Origin

In order to describe differentiation of self this section will provide an overview of the history and definition of differentiation of self. Bowen conceptualized the complex patterns

that arise in close family relationships in his family systems theory (Bowen, 1978). Differentiation of self is a central construct in Bowen's theory of family development and relationships. Bowen needed a construct that could describe the unique interaction between the cognition, affect, independence, and togetherness as a person progressed through the life span.

Differentiation of self represents the ability for a person to view him or herself as an individual apart from his or her family of origin (Bowen, 1978; Kerr & Bowen, 1988). Differentiation of self is also the ability for a person to distinguish between thoughts and emotions. Licht and Chabot (2006) provide an insightful description in their discussion of differentiation of self. They describe differentiation of self as a composite concept uniting the development of individuation with the development of the intrapsychic ability to differentiate between thoughts and emotions. Recent views also attempt to clarify the nature of differentiation of self. Charles (2001), for example, included reaching emotional maturity and acting independently while maintaining relationships in his definition. The hallmarks of differentiation have been seen as feelings of security, empathy, sensitivity, and concern, and the ability to think rationally in the midst of an emotional situation (Bowen, 1978; Charles, 2001; Crespi & Sabatelli, 1997). Bowen (1978; Kerr & Bowen, 1988) believed that differentiation of self was largely complete by the time that a person left their family of origin. Typically this would be young adulthood. I theorize that differentiation of self continues to change throughout the lifespan especially during times of great change such as the college experience, therapeutic interventions, or traumatic experiences.

3

Differentiation of Self in Relation to Other Constructs

Differentiation of self has been theorized, and found, to interact with a variety of constructs. Bowen (1978; Kerr & Bowen, 1988), and others, believed that the inherent nature of the processes of individuation and emotional development that he conceptualized as differentiation of self would lead to the development, alteration, or reduction of a variety of psychological constructs. This section will explore these themes by discussing differentiation of self in the context of stress, functioning, and psychological distress.

Bowen (1978) hypothesized that higher levels of differentiation of self would be associated with higher levels of overall functioning, both psychological and physiological. More specifically, Bowen argued that higher levels of differentiation would be associated with increased ability to navigate complicated emotional relationships, decreased symptoms of stress, lower levels of perceived stress, and fewer feelings of anxiety (Bowen, 1978; Kerr & Bowen, 1988). Differentiation of self is also related to resilience (Bowen, 1978; Kerr & Bowen, 1988). Individuals with higher levels of differentiation of self experience less stress from a particular stressor and also recover faster from the symptoms that they do experience compared to individuals with lower levels of differentiation (Bowen, 1978; Kerr & Bowen, 1988).

Bowen (1978) was also specific in noting that low differentiation of self is not, itself, responsible for the development of symptoms. He notes that there are individuals with low levels of differentiation of self who maintain emotional balance throughout their lives. Thus, individuals with low levels of differentiation of self are not always experiencing negative

4

symptoms, distress, and stress. They are more likely to experience negative symptoms of stress when exposed to stress, however.

Bowen (1978; Kerr & Bowen, 1988) argued that differentiation of self would be positively related stronger coping skills and resilience against developing symptoms when stressed. He also predicted that higher levels of differentiation of self would be related to increased emotional regulation and rational thinking. Indeed, he proposed that the ability to maintain adaptive, satisfying significant relationships increases as differentiation of self increases (Bowen 1978).

Empirical Support for Differentiation of Self

Several studies have sought to clarify, explore, and support the construct of differentiation of self. Differentiation of self has been studied in a variety of contexts with a variety of instruments. The results appear to be largely consistent with Bowen's theory. In this section empirical evidence concerning differentiation of self is presented. Overall functioning is discussed first including psychological functioning and self esteem. The emotional regulation aspect of differentiation of self is reviewed. Then, a brief overview of the relationship between differentiation of self and stress is discussed.

Much of the research has supported Bowen's (1978) claims that differentiation of self is associated with higher levels of overall functioning. Many studies have supported predictions that differentiation of self would be negatively related to various aspects of psychological distress such as anxiety, depression, and stress (Chung & Gale, 2006; Drake & Murdock, 2008; Murdock & Gore, 2004; Peleg, 2005).Differentiation has also been found to be positively associated with constructs such as self-esteem, psychological development, and

5

overall functioning (Chung & Gale, 2006; Jenkins, Buboltz, Schwartz, & Johnson, 2005; Knauth & Skowron, 2004).

Bowen (1978; Kerr & Bowen, 1988) also believed that differentiation of self would be related to psychological functioning. Several empirical studies have found support for this hypothesis when exploring the relationship between differentiation of self and various aspects of psychological functioning. For example, Bartle-Haring, Glebova, and Meyer (2007) operationalized functioning as continuation in therapy and found that higher levels of differentiation of self were related to a reduced probability of early termination in therapy than individuals with lower levels of differentiation of self. Differentiation of self was also found to be positively associated with functioning in homeless populations (Hertlein & Killmer, 2004). It should be noted, however, that functioning was defined differently in each of these studies and typically involved the reduction of symptoms and the increased ability to navigate difficult situations.

Meyer (1997) went a step further and measured functioning in addition to specific eating disordered behaviors. Differentiation of self was found to be related to higher functioning through a negative relationship with eating disorder symptoms in women (Meyer, 1997). Jenkins et al., (2005) found that differentiation of self was related to higher levels of psychosocial development. Rosen, Bartle-Haring, and Stith (2001) found that the potential for dating violence was reduced in individuals with higher levels of differentiation of self when compared to individuals with lower levels of differentiation of self. In addition to functioning and psychosocial development, differentiation of self has also been associated with self esteem. Chung and Gale (2006) found that higher differentiation of self was

6

associated with higher levels of self-esteem. In addition Skowron, Holmes, and Sabatelli (2003) demonstrated that differentiation of self was positively associated with levels of life satisfaction.

Affect is also important to consider because of the emotional elements emphasized in discussions of differentiation of self. A person with high levels of differentiation of self is thought to be able to maintain emotional relationships with others throughout his or her life with little anxiety (Bowen, 1978; Kerr & Bowen, 1988). It can also be expected that higher levels of differentiation of self will be associated with increased ability to respond appropriately to affect, process intense affect, and respond with less intense affect when necessary. Existing research broadly supports these hypotheses.

For example, higher levels of differentiation of self have been associated with less depression and psychological reactance (Chung & Gale, 2006; Johnson & Buboltz, 2000). Differentiation of self has also been related to the ability to appropriately process and disclose emotions (Skowron, 2004; Skowron & Dendy, 2004; Wei, Vogel, & Ku, 2005). Williamson, Sandage, and Lee (2007) found that differentiation of self was positively associated with hope and social connectedness and negatively related to feelings of shame. Lambert and Friedlander (2008) found that higher levels of differentiation of self were associated with higher levels of emotional control, and increased feelings of support and security within a family therapy relationship. Of particular interest is how differentiation of self related to anxiety. Anxiety is a unique aspect of affect in that it is often accompanied by physiological changes. Several studies have found that higher levels of differentiation of self have been associated with lower levels of separation, state, and trait anxiety (Knauth,

7

Skowron, & Escobar, 2006; Peleg, 2005; Peleg-Popko, 2002; Peleg, Halaby, & Whaby, 2006)

The hypothesized relationship between differentiation and stress was that individuals with higher levels of differentiation of self would experience lower levels of stress and would also experience fewer symptoms of stress compared to individuals displaying lower levels of differentiation experiencing similar conditions (Bowen, 1978; Kerr & Bowen, 1988). Murdock and Gore (2004) found support for Bowen's hypotheses when they found that differentiation of self moderated the relationship between perceived stress and symptoms. When examined, the moderation revealed that individuals with higher levels of differentiation of self reported lower levels of psychological symptoms given the same amount of stress when compared to individuals with lower levels of differentiation of self. Skowron, Wester, and Azen (2004) found that differentiation of self mediated the relationship between stress and psychological distress, also supporting Bowen's hypotheses, albeit from an alternative perspective.

Differentiation of Self in a Multicultural Context

Differentiation of self has also been found to be relevant in a multicultural context. Researchers have contributed to the differentiation of self literature through the study of differentiation of self in a variety of cultural contexts. Differentiation of self has been used in samples that consisted of African American youth, Korean students, Pilipino families, and Israeli college students. Differentiation of self has also been studied in a variety of age groups from children to adults. Discussed below, these studies have linked differentiation of self to positive outcomes and lower psychological distress.

8

Gushue and Constantine (2003) explored the relationship between differentiation of self and individualism in African American women. Gushue and Constantine believed that individualism was associated with a stronger sense of self and would be associated with higher levels of differentiation. The evidence supported the hypotheses an differentiation of self was positively related to individualism (Gushue & Constantine, 2003). Differentiation of self has been used with Israeli populations with results that support Bowen's (1978) hypotheses (Peleg, 2005; Peleg-Popko, 2002; Peleg et al., 2006).

Chung and Gale (2006) found that differentiation of self was associated with higher levels of self-esteem and lower levels of depressive symptoms in both a Korean and a European American sample. Chung and Gale noted that the relationships between differentiation of self, self-esteem and depression were consistent although the average level of differentiation of self was lower in the Korean student sample than the comparison sample of European Americans. Tuason and Friedlander (2000) found that individuals in the Philippines had approximately the same overall level of differentiation of self as the sample in Skowron and Friedlander (1998). The patterns of the DSI subscales were slightly different in the Philippine sample, however. The individuals in the Philippine sample were less emotionally reactive, more emotionally distant, and reported a higher overall level of sense of self than did the normative sample (Tuason & Friedlander, 2000).

Differentiation of self has also been tested in samples of different ages. Knauth and Skorwron (2004) along with Knauth et al. (2006) examined differentiation of self in adolescents, finding that differentiation of self was negatively related to immediate and chronic anxiety and also negatively related to symptoms. Knauth et al. (2006) similarly found

9

that differentiation of self is negatively related to chronic anxiety. In addition, Knauth et al. (2006) found that differentiation of self was positively related to social problem solving in adolescents. Differentiation of self has also been studied with older adults with results indicating similarly supportive data (Kim-Appel, Appel, Newman, & Parr, 2007).

The research supporting differentiation of self is varied in focus and population. Much of the research consistently supports Bowen's (1978) original hypotheses. One limitation of the empirical support concerning Bowen's theory is the use of a variety of methods for operationalizing differentiation of self. Differentiation of self is a complicated construct and more consistency is needed in the operationalization of the construct before more conclusions can be drawn about the nature of differentiation of self in a variety of contexts.

Measuring Differentiation of Self

Differentiation of self has been measured in individuals, families, parsed into individuation or emotional regulation, and has been assessed using qualitative method and quantitative methods. In this section the variety of methods of measuring differentiation of self in an individual context will be discussed. The differentiation of self inventory, and the revised version, are reviewed first because they are the primary focus of this study. Then other measures of differentiation of self are discussed.

Differentiation of Self Inventory. Originally developed by Skowron and Friedlander (1998) the DSI was designed to facilitate three processes: testing theoretical assumptions in Bowen theory, assessing individual differences in adult functioning, and evaluating

psychotherapeutic outcomes of Bowen Family Systems therapy. This section reviews the scale construction methods used for the DSI.

Initially 96 items were created by using statements that exemplified Bowen's theoretical constructs. Skowron and Friedlander (1998) used three studies to refine the 96 items into the DSI. In the first study Skowron and Friedlander (1998) chose to asses only individuals whose differentiation of self was established and thus participants were at least 25 years old. Principle Components Analysis (PCA) was used to analyze the data from the sample resulting in the distillation of the 96 items to 44 items. The 44 items were split into four subscales based on content and the results of the PCA. The subscales were Emotional Reactivity (ER), Fusion with Parents, I-Position (IP), and Reactive Distancing. A full scale score was also calculated by adding up the scores of the 44 items. The PCA revealed that a significant amount of variance was unaccounted for in the original analysis. The resulting unaccounted variance and the range of internal consistencies (from .58 to .80) prompted Skowron and Friedlander (1998) to initiate the second study to refine the scale.

In the second study Skowron and Friedlander (1998) revised the scale to try to limit the impact of social desirability bias and improve the conceptual framework of the scale. Skowron and Friedlander retained the four or five best items from each scale and then constructed several new items for each scale. The ER and IP subscales were retained but the Fusion with Parents subscale was re-structured into the Fusion with Others (FO) subscale and the Reactive Distancing subscale was restructured into the Emotional Cutoff (EC) subscale. Thus, Skowron and Friedlander began study 2 with 78 items that were divided into the four subscales (EC, ER, FO, and IP).

11

Using an item-level analysis Skowron and Friedlander (1998) eliminated items with low item-scale correlations. Of the 78 initial items 43 were retained. Seven items were redistributed to alternative subscales based on item-scale correlations with the new subscale and upon consultation with Bowen experts. A full scale score is calculated by adding up the sum of the items and then dividing by the total number of items.

In the third study Skowron and Friedlander (1998) confirmed the factor structure of the DSI through a confirmatory factor analysis (CFA). The CFA of the four factor model proposed by Skowron and Friedlander was found to be a good fit for the sample in their study. The third study established that the four components in the DSI had evidence of structural support and related, theoretically, to different aspects of differentiation of self. It should be noted that the DSI full scale score was not confirmed in this study and that the CFA only pertained to the subscales of the DSI.

According to Skowron and Friedlander (1998) the ER subscale is used to assess the potential for a person to become overwhelmed with affect emotional situations as described by Bowen (1978). A person with less emotional reactivity is viewed as being more capable of reacting with less emotional intensity when the situation calls for a calmer response. Thus, lower emotional reactivity is associated with higher differentiation of self. The ER scale is negatively scored higher values on the ER scale reflect more differentiation of self and less emotional reactivity.

Bowen's (1978) believed that interpersonal fusion was a person's tendency to enmesh themselves with a significant other to strengthen their own identity. Skowron and Friedlander's (1998) FO subscale is designed to assess the tendency to fuse. As fusion

increases a person is less able to express their own beliefs, values, and thoughts apart from those expressed by his/her significant other in a stressful situation (Bowen, 1978). As fusion increases a person is less able to extricate themselves from a harmful or painful relationship. Less fusion is preferable and is exemplary of higher differentiation of self. The FO subscale is negatively scored and a high score on the FO subscale reflects a lower tendency towards fusion and more differentiation of self.

The desire to shut down or emotionally withdraw during stressful situations is assessed by the EC subscale (Skowron & Friedlander, 1998). When stressful events occur, and affect increases in intensity, a person may feel the need to escape, avoid, or ignore the situation (Bowen, 1978). As differentiation of self increases a person is more capable of acknowledging, experiencing, and coping with stronger emotions and more stressful situations and is less likely to feel the need to emotionally withdraw. The EC subscale, like the ER and FO subscales, is negatively scored and so higher values reflect less emotional cutoff and more differentiation of self.

The IP subscale measures a person's ability to present their own beliefs, values, or perspective despite a stressful situation. Bowen (1978) viewed I Position as the resilience of the identity of a person despite stress, strong affect, and the influence of significant others (Bowen, 1978). More ability to present your own views and not be overwhelmed with affect, particularly anxiety, is a hallmark of higher differentiation of self. The IP scale reflects more ability to maintain an I Position and thus is indicative of higher differentiation of self.

Skowron and Friedlander (1998) also assessed the concurrent criterion validity of the DSI. The scale was compared with the trait portion of the State-Trait Anxiety Inventory. As

hypothesized, the results indicated that higher scores on the DSI were associated with lower levels of trait anxiety.

Skowron and Friedlander (1998) provided some evidence of construct validity of the DSI subscales. With regard to the DSI-Full scale, however, the evidence of construct validity is weak or non-existent in the original development studies of the DSI (Skowron & Friedlander, 1998). Though Skowron and Friedlander (1998) describe the full scale and empirically support the impact of the overall scale they do not describe the intended use of the full scale. Nor do they provide support for the structural validity of the full scale score. The discussion largely centers on the individual subscales. The full scale score is often reported and used as a "snapshot" of the overall level of differentiation of self that averages different levels of the subscales. The use of the full scale score as a summary of a person's level of differentiation of self is consistent in many of the empirical studies that use the DSI and, as we see below, the DSI-R.

The psychometric properties of the DSI reported by Skowron and Friedlander (1998) supported internal consistencies ranging from adequate to good. Specifically, Skowron and Friedlander found that the internal consistencies of the specific scales were: ER (α = .88), FO (α = .70), IP (α = .85), EC (α = .79), and full scale DSI (α = .88). Table 1 presents means and internal consistency coefficients from this research.

14

Table 1
Psychometric Properties of the DSI and
DSI-R*

| | DSI (n = 127) | | | DSI-R (n = 225) | | |
	Mean (SD)	95% CI	Alpha	Mean (SD)	95% CI	Alpha
ER	3.37(.94)	1.49 to 5.25	0.88	3.15(1.06)	1.03 to 5.27	0.89
FO	2.92(.85)	1.22 to 4.62	0.70	3.84(.98)	1.88 to 5.80	0.86
IP	4.08(.85)	2.38 to 5.78	0.85	4.07(.85)	2.37 to 5.77	0.81
EC	4.53(.79)	2.95 to 6.00	0.79	4.34(.93)	2.48 to 6.0	0.84
Full Scale	3.74(.60)	2.54 to 4.94	0.88	3.86(.72)	2.24 to 5.12	0.92

*DSI information from Skowron and Friedlander (1998); DSI-R information
from Skowron and Schmitt (2003)

The DSI was a significant advancement in the process of empirically assessing

differentiation of self. The scale was developed using theoretical constructs and tested using

empirical methods. As a scale the DSI demonstrated adequate psychometric properties and

provided researchers with a way to measure both the individuation and emotional aspects of

differentiation of self. The instrument, however, still needed more empirical validation,

psychometric revision, and some of the results of the studies were problematic. These

difficulties were partially addressed in the development of the DSI-R.

Differentiation of Self Inventory-Revised. The DSI was used in several studies after

the creation of the instrument. Several researchers noted that interpretations drawn from the

results of the FO subscale were inconsistent with Bowen theory. The inconsistencies noted by these researchers along with the poor psychometric properties of the DSI inspired Skowron and Schmitt (2003) to enhance the FO subscale with a new study and analysis. The result of the analysis and item construction of the new FO scale, in combination with the other subscales from the DSI, is the DSI-R.

Subsequent reviews of the DSI critiqued the instrument due to the low internal consistency coefficient for the FO scale and raised questions about the construct validity of the scale. Specifically, several studies using the DSI had findings that were inconsistent with theoretical predictions (Skowron et al., 2004). For example, Skowron and Schmitt (2003) reported that the original FO subscale had significantly lower internal consistency estimates than the other subscales or the full scale. Skowron and Schmitt (2003) also noted that the original FO subscale did not relate as strongly as predicted to several constructs such as psychological adjustment (Skowron & Friedlander, 1998) and problem solving (Skowron, 2004). In response, Skowron and Schmitt (2003) re-evaluated the FO subscale of the DSI.

Skowron and Schmitt (2003) initially constructed several new items that were to be used to potentially augment the FO subscale. Skowron and Schmitt (2003) chose to keep five items out of the original FO subscale. After consultation with a committee of experts 17 new items were retained for testing for use as possible additions to the FO subscale.

Skowron and Schmitt (2003) collected data from a sample of adults to assess the factor structure of the new items and the FO subscale. Skowron and Schmitt (2003) used item analysis to select additional items resulting in12 total items for the new FO subscale. These new items increased the total scale length to 46 items. The new FO subscale had an internal

consistency coefficient which was significantly better than the original subscale internal consistency ($\alpha = .86$; Skowron & Schmitt, 2003). The new subscale scale related to other measures of fusion and differentiation as expected, supporting the construct validity of the scale within the context of the sample. The new FO subscale along with the original ER, IP, and EC scales comprise the DSI-R.

The DSI-R stands on a significant theoretical foundation supported by empirical evidence. Skowron and Friedlander (1998) and Skowron and Schmitt (2003) used factor analytic techniques to select items for each of the subscales. The techniques employed share the weakness of being non-specific concerning the characteristics of each item to measure a particular portion of the differentiation of self spectrum.

Consider the FO subscale, as an example. Items with a factor loading greater than .40 were selected for the FO subscale. Factor loadings are measures of the average strength of relationship between the item and the corresponding scale items. Thus, it is possible that several of the 12 items included in the FO subscale measure the same portion of the fusion spectrum. I hypothesized that if each item could be assessed in more detail to discern the relationship that the item has to the spectrum of ability that measures fusion with others then several items could be eliminated to make the scale more efficient. The goal of the first study described below was to carry out item analyses on each of the subscales using Item Response Theory and then use the results to construct a more efficient measure of each of the subscales.

Measuring Convergent Validity. The DSI-R is just one scale that is used to assess differentiation of self at the individual level. The following section describes several

17

measures of differentiation of self and their appropriateness, or inappropriateness, for use as a measure to assess convergent validity.

The LDSS is a re-evaluation of the Differentiation of Self Scale (DOSS; Kear, 1978; Kim & Merrifield, 1982 as cited in Haber, 2003). The DOSS had several subscales and two (emotional maturity and emotional dependency) were used as seed items for the LDSS. In total 12 items were taken from the previous scale and used in conjunction with a new set of items to form the basis of the LDSS. The items were reviewed by a panel of experts and then assessed using factor analysis. Haber (2003) concluded that the scale was unidimensional despite being seeded by items from two subscales of the DOSS. After revisions, 24 items with each item measured on a four point scale ranging from 1 *strongly disagree* to 4 *strongly agree* remained to form the LDSS.

The LDSS uses both positively and negatively scored items to measure differentiation of self from one's family of origin. Haber (2003) offers evidence towards content validity by indicating that the scale items were reviewed by a panel of experts, and confirmed through an exploratory factor analysis. Evidence of concurrent criterion validity was provided as the LDSS has been shown to be negatively related to chronic and acute anxiety (Haber, 2003). Haber (2003) also showed that there was a negative relationship between the LDSS and psychological dysfunction.

Though adequate at the time of its creation the LDSS is not as complete as the DSI-R (Licht & Chabot, 2006). The LDSS has also been questioned in terms of structural validity and has had limited empirical use after the development of the DSI-R (Haber, 2003; Licht & Chabot, 2006). The development of the DSI occurred since the weaknesses of the LDSS

made it insufficient for research. The LDSS, however, makes a suitable comparison instrument in order to provide support with respect to convergent validity with the DSI-SF. It was a predecessor to the DSI and is one of the measures that is closest to measuring similar constructs assessed by the DSI-R. Thus, although the LDSS may have been made obsolete by the development of the DSI-R it was suitable as a comparison measure to establish that the DSI-SF is measuring the same construct.

Empirical Findings for Differentiation of Self in Relationship with Other Variables

The creation of a measure such as the DSI-SF is only the first step in the process of scale creation. In the second study other variables were used to support evidence of the concurrent criterion validity of the DSI-SF. This was done in order to support the use of the DSI-SF for use in future research. Many of the variables described below were also empirically related to the DSI and DSI-R. I hypothesized that the DSI-SF would be related to perceived stress, depression, chronic and acute anxiety, and self esteem in similar ways as the DSI and DSI-R have in past literature.

As noted earlier, Bowen (1978; Kerr and Bowen 1988) also predicted that differentiation of self would be related to psychological distress and psychological wellbeing. Ridner (2003) broadly described psychological distress as the emotional, cognitive, and behavioral reactions to stress. Studies have conceptualized psychological distress in a variety of ways including negative aspects such as depression and anxiety (Gangstad, Norman, & Barton, 2009; Jorden, Matheson, & Anisman, 2009; Nuru-Jeter, Williams, & LaVeist, 2007; Ritsner, Modai, & Ponizovsky, 2000). Psychological wellbeing is defined as the combination of emotional or cognitive resiliency despite the presence of stressors and enhancing the

functioning of the individual. Studies have operationalized psychological wellbeing through positive aspects such as self-esteem and life satisfaction (Chung & Gale, 2006; Skowron et al., 2003).

Stress. Bowen (1978; Kerr & Bowen, 1988) predicted that individuals with higher levels of differentiation of self would experience lower levels of perceived stress. This relationship has been confirmed by Murdock and Gore (2004) and by Skowron et al. (2004). Although the mechanics of the relationships between stress, differentiation, and psychological distress differ between these two studies, both agree that higher differentiation of self is related to lower levels of perceived stress. It was hypothesized that the DSI-SF would support these findings by having a negative relationship with perceived stress.

Stress can be defined as any condition that perturbs physiological and psychological homeostasis and results in a change in behavior, physiological, or mental functioning (Vondras, Powless, Olson, Wheeler, & Snudden, 2005). Common reactions to stress include the activation of the autonomous nervous system which can result in increased heart rate, rapid breathing, restriction of blood flow to the extremities, and the release of adrenalin among other effects. Stress can also trigger affective reactions including worry, depression, and increased irritability.

Stress is ubiquitous and it leaves both psychological and physiological footprints. In terms of psychological footprint, stress is associated with affective and cognitive changes. The importance of understanding the affective response to stress can be illustrated by the work of Esler, Schwarz, and Alvarenga, (2008). Esler et al. (2008) discuss the link between stress and the health and operation of the heart indicating that the psychological impact of

stress can also reach into the physiological arena. Vondras et al. (2005) found that increased perceived stress was predictive of a reduction in individual's ability to learn and recall stories or events. Weekes, MacLean, and Berger (2005) found that increased levels of perceived stress were associated with higher levels of depression and anxiety. Weekes et al. (2005) found that men and women may experience stress differently. Specifically, in their study, Weekes et al. (2005) found that the relationship between perceived stress and symptoms for women was about twice as strong as it was for men. The relationship between perceived stress and depression, however, was about the same for men and women.

Stress can be reduced through the use of coping skills, as noted by Lazarus and Folkman (1987). Schüler, Job, Fröhlich, and Brandstätter (2009) found that individuals who experienced stress due to incongruence between implicit and explicit motivations experienced fewer symptoms if they were able to disclose and express their emotions. In addition to the implications for psychotherapy this finding supports the role of differentiation of self in reducing symptoms of stress. Individuals with higher levels of differentiation of self will be able to more easily and more effectively disclose their emotions and thus will experience fewer symptoms from stress associated with incongruent motivations.

Depression. Depression is defined, in part, by distinct affective manifestations such as loneliness, sadness, and apathy. Accompanying the affective markers there may also be a negative self-concept wherein the person has an extraordinary amount of self blame or shame (Beck & Alford, 2009). Bowen (1978; Kerr & Bowen, 1988) believed that individuals with higher levels of differentiation of self would be less likely to experience feelings of depression as an expression of his or her psychological distress. Chung and Gale (2006)

viewed depression symptoms as an operationalization of psychological distress. They believed that differentiation of self would be negatively associated with symptoms of depression because of the resiliency factors theorized within differentiation of self as described by Bowen. Essentially individuals with higher levels of differentiation of self should be able to recognize troubling thoughts, control emotional symptoms, and diffuse loneliness through objective thinking and engaging in appropriate intimate relationships (Bowen, 1978).

Depression can lead to a significant reduction in overall functioning. Diener, Kuehner, Brusniak, Struve, and Flor (2009) found that feelings of helplessness and uncontrollability of stressors were associated with more severe symptoms of depression. The most severe result of depression is suicide. Beck and Alford (2009) indicate that the rate of suicidality among people with a depressive disorder may be as low as 5% or may be much higher. Empirical studies have linked negative life events to the development of depression. Hammen, Henry, and Daley (2000) found that women who had experienced a significant stressor earlier in life (e.g. parental violence, parent pathology, or alcoholism) were more likely to experience depression as adults.

Chung and Gale (2006) supported Bowen's initial assertions that differentiation of self would be associated with lower levels of depression. Differentiation of self should act as a mitigating factor in the development of these symptoms and therefore should be, overall, negatively related to symptoms of depression. I hypothesized that the DSI-SF would be negatively related to depression symptoms thus adding to the support of differentiation of self as a construct and the DSI-SF as a measure.

22

Anxiety. Anxiety is the experience of worry or fear that originates from an ambiguous source. I view Bowen's discussion of anxiety as two distinct experiences: chronic anxiety and acute anxiety. Chronic anxiety is the pattern of consistent worry or concern that persists despite external events. Chronic anxiety also indicates a predisposition to experiencing acute anxiety. In other words, if a person experiences anxiety on a chronic basis then stressful events may be likely to increase the experience of acute stress as a reaction to those events. As noted before Bowen (1978) believed that chronic anxiety in an individual is a direct result of the anxiety that individuals have concerning their relationship to their families. Acute anxiety, alternatively, is a transitory experience of worry or concern. Acute anxiety typically follows the perception of stress and may be viewed as a symptom of stress. Acute anxiety can be intense and cause the experience of uncomfortable sensations. Bowen (1978) discussed acute anxiety as a reaction to interactions between family members and as a response to stress.

Bowen viewed anxiety in the individual as a chronic factor or life pattern (Bowen, 1978). Bowen (1978) stated that the level of chronic anxiety that a person experiences is a function of the unresolved emotion and anxiety of the parent. Bowen also noted that higher levels of differentiation within the family would lead to lower levels of chronic anxiety. Bowen has asserted that higher levels of differentiation of self should be negatively related with chronic anxiety. It is interesting to note that, with respect to anxiety, Bowen (1978) argued that a certain level of anxiety is inevitable if emotional growth is to occur within the individual.

23

Several studies have utilized both acute and chronic anxiety as operational definitions for psychological distress in relationship to differentiation of self. Knauth and Skowron (2004) found that, in adolescents, differentiation of self was negatively related to both chronic and acute anxiety. In their study Knauth, et al. (2006) also found that differentiation of self was negatively related to acute anxiety in adolescents. Several studies also found that differentiation of self was negatively related to experiences of acute anxiety (Peleg, 2005; Peleg-Popko, 2002; & Peleg et al., 2006). These findings support Bowen's (1978; Kerr & Bowen, 1988) original beliefs about differentiation of self and both chronic and acute anxiety. I hypothesized that the DSI-SF would be consistent with the earlier empirical findings and thus have a negative relationship with both chronic anxiety and acute anxiety.

Self-Esteem. Bowen (1978; Kerr & Bowen, 1988) indicated that differentiation of self was not only associated with mitigating psychological distress but also with fostering growth in the individual. Bowen (1978) indicated that differentiation of self not only mitigated negative intrapsychic forces but fostered the development of positive factors. Therefore, psychological wellbeing is as important to consider as psychological distress.

Chung and Gale (2006) used self-esteem to as an operationalization of psychological wellbeing. They hypothesized that if someone is experiencing less distress and is developing a strong sense of self then self-esteem should be positive as well. Self-esteem has been conceptualized as a spectrum from negative feelings about one's self to positive feelings. Positive self-esteem has been linked with increased feelings of control and optimism (Brewin & Furnham, 1986). Positive self-esteem has also been associated with a number of important aspects of psychological health (Chioqueta & Stiles, 2007; Murrell, Meeks, & Walker, 1991;

24

Koeske & Koeske, 1990). Chung and Gale (2006) tested this assumption and found that differentiation of self was positively associated with self-esteem. Thus, it was expected that the DSI-SF would have a positive correlation with self-esteem.

Summary and Hypotheses

Differentiation of self is a complex construct that has been shown to be related to several important factors such as perceived stress, depression, chronic anxiety, acute anxiety, and self-esteem. Understanding differentiation of self can help researchers understand individuals and systems more fully. Exploring the relationships among differentiation of self, self-esteem, depression, and anxiety can also help inform clinical practice.

Licht and Chabot (2006) indicate that the DSI-R is a valuable and broad measure of both the individuation and the intrapsychic distinguishing between emotion and thought components of differentiation of self. The DSI-R has been a valuable resource for researchers for the past several years. The measure has been shown to have reliable interpretations in a variety of contexts, and the validity of the instrument has also been supported in a variety of contexts. As noted earlier, the DSI and DSI-R have been used in a variety of cultural contexts, age ranges, and cultural contexts (Chung & Gale, 2006; Skowron & Friedlander, 1998; Skowron & Schmitt, 2003; Tuason & Friedlander, 2000; etc.).

The purpose of the three studies described in this manuscript was to build the DSI-SF and then provide evidence concerning the interpretation of the scores (e.g. convergent and criterion validity) within a college student context. First, the GRM was used to create the DSI-SF. Second, confirmatory evidence was found by assessing the construct and concurrent

criterion validity of the DSI-SF within the context of a college aged sample. Finally, a preliminary estimate of the test-retest reliability of the DSI-SF was generated.

Study 1 Hypotheses. A shortened form of the DSI-R, the DSI-SF, would produce scores as reliable as those of the full-length DSI-R.

Study 2 Hypotheses. A GRM analysis of the DSI-SF would fit the data. In addition, inferences based on the scores of the DSI-SF would be consistent with those of the DSI-R, such that the DSI-SF subscales, and full scale score, would be negatively related to perceived stress, reported symptoms of depression, chronic anxiety, acute anxiety. In addition, I hypothesized that the DSI-SF subscales and full scale score would be positively related to self-esteem. Finally, in order to support the convergent validity of the DSI-SF, I predicted that the DSI-SF subscale and full scale scores would be positively related with the LDSS.

Study 3 Hypothesis. To support the use of the scale at several testing points over a period of time a preliminary estimate of the test-retest reliability was conducted. I predicted that all of the DSI-SF subscales and the full scale score would have adequate test-retest reliability.

CHAPTER 2

STUDY 1

Method of Study 1

Participants. As a part of a previous study, data were collected from 352 participants using convenience sampling techniques (Drake & Murdock, 2008). The goal of the study was to assess the relationship between differentiation of self, perceived stress, and symptoms of stress. Scores on measures of perceived stress, psychological distress, and physical symptoms of stress were collected along with the DSI-R.

Prior to analysis eight cases were removed due to missing data. A participant was removed if they were missing data on any items of the DSI-R. Because of the small portion of participants with missing items (eight out of 352) the missing values were not imputed. The demographics of the participants that were missing items indicate that of the eight most were men ($n = 7$) and Caucasian ($n = 6$). The ages of the participants with missing data ranged from 19 to 56 and did not appear to be related to the missing data. This may indicate that a small portion of Caucasian men in the population may not respond to some items.

The participants ranged in age from 18 to 58 ($M = 25.89$, $SD = 8.00$) and were all college students at a midsized Midwestern university. The majority of the sample identified as female ($n = 191$, 55.5%) and as Caucasian ($n = 245$, 71.2%), with other ethnicities as follows: African American ($n = 51$, 14.8%), Hispanic ($n = 15$, 4.4%), Asian or Pacific Islander ($n = 20$, 5.8%), and Other ($n = 13$, 3.8%). This sample is demographically similar to the target population. The National Center for Educational Statistics (NCES; U.S. Department of Education, 2011) indicated that, for students in undergraduate and graduate

27

degrees, the population is between 56% (undergraduate) and 50% (graduate) female. The NCES also indicated that combined between graduate and undergraduate degrees students were 66% Caucasian, 8.3% African American, 5.7% Hispanic, 7.9% Asian American, and 11% international student. Although similar to the target population the sample does have a higher percentage Caucasian and African American students whereas both Hispanic and Asian students were under represented.

Skowron and Friedlander (1998) and Skowron and Schmitt (2003) hypothesized that individuals who were older than 25 would have a fully formed and stabilized sense of differentiation of self. However, several studies have since used the DSI and DSI-R in a college aged population. Researchers have also offered more evidence to support the structural validity of the scales (Chung, & Gale, 2006; Gushue & Constantine, 2003; Skowron, 2004; Skowron et al., 2004; Wei et al., 2005). Thus, the college aged samples in this study are representative of the sample needed to construct a short form of the DSI-R that produces interpretable scores within the context of a college student sample. According to theory, US college student population contains individuals spanning the full range of differentiation of self. The variability of differentiation of self levels between participants should be sufficient to ensure the estimation of item characteristics through Item Response Theory (IRT).

Instruments. Differentiation of Self: *The Differentiation of Self Inventory – Revised* (DSI-R) was developed by Skowron and Schmitt (2003), and was based on the original scale by Skowron and Friedlander (1998). The DSI-R consists of 46 items that are divided into four subscales: EC, ER, FO, and IP. Some sample items including: *I'm overly sensitive to*

criticism, and *I'm fairly self accepting.* Participants rated each item on a scale that ranged from 1 (*not at all like me*) to 6 (*very much like me*), where higher values indicate more differentiation of self. Some items are reversed scored.

The DSI-R has been used as a measurement of a person's overall differentiation of self. Skowron and Schmitt (2003) reported an overall Chronbach's α coefficient estimate of .92 (unless otherwise noted all reliability coefficients are Chronbach's alpha). The 12 item EC subscale measures distancing oneself from strong emotions (α = .84; Skowron & Schmitt, 2003). The ER subscale has 11 items and assesses the tendency to react to stressful situations with strong emotions. The ER subscale has an internal consistency estimate of α = .89 (Skowron & Schmitt, 2003). The 12 item FO subscale measures how much of the person's identity is intrinsically related to other people (α = .86; Skowron & Schmitt, 2003). The IP subscale measures the ability for the person to maintain independence in close relationships using 11 items. The internal reliability estimate for the IP subscale was α = .81 (Skowron & Schmitt, 2003).

In terms of construct validity, Knauth and Skowron (2004) documented that higher values on the DSI-R are related to lower levels of chronic anxiety. This relationship is consistent with predictions from theory and established in previous research using other measures of differentiation. Skowron et al. (2004) found that the DSI-R has been positively related to psychological functioning.

Analytic Technique. Samejima's (1969; 1997) Graded Response Model (GRM), a subset of general IRT, was used to evaluate the characteristics of the DSI-R in a college student population. The GRM attempts to model a polytomous (e.g., Likert scale) item on to

29

the latent trait that it purports to measure. Each item is assumed to be present at some point along the spectrum of that latent trait with each category representing a different level of that ability. The GRM models both item characteristics (e.g. discrimination and difficulty) and examinee ability (θ) on the same scale representing the presence of both on the spectrum for the latent trait (Osterlind, 2006). Thus, an item may be most accurate at measuring differentiation of self for participants between -2 standard deviations and +1 standard deviations of the mean for differentiation of self. At the same time, GRM can place an examinee at +0.5 standard deviations above the mean. The item, then, would be most accurate at -2 to +1 θ and the examinee has a $\theta = +0.5$.

When used to assess rating scales, the GRM produces an estimate for each item that includes an average rate of change, the *discrimination* (*a*), for the item. In addition, the GRM also produces distinct categorical thresholds representing the amount of differentiation of self needed to progress to the next highest category, the *difficulty* (*b*).

Using IRT offered advantages from both empirical and theoretical perspectives. Empirically, the GRM is a well-known and accurate method of estimating the critical parameters of an item. The GRM is a powerful technique that is made more powerful through the parsimony of the analysis. On a theoretical plane, the GRM offers unique advantages due to the assumptions and implications of IRT. Specifically, using an IRT model indicates that the resulting item information is, essentially, a window that looks onto the spectrum of differentiation of self.

The window provided by IRT allows measurement estimates to be made that are independent of a particular item or person. The real value of using IRT is that the information

30

gained about the DSI-R can be used to assess the position of each item on the latent spectrum of differentiation of self. Then, of the available choices, a series of items can be chosen that represent the lower, middle, and higher ends of the differentiation of self spectrum. Other methods of item analysis (traditional factor analysis, Structural Equation Modeling, etc.) do not offer the same unique mixture of practical and theoretical benefits as the IRT approach.

Results of Study 1

Item Response Theory Assumptions. There are two key assumptions that must be upheld in order to use the GRM: unidimensionality and local independence. Unidimensionality asserts that the items evaluated assess a singular latent trait. Theoretically, the unidimensionality of the DSI-R subscales was proposed and supported by Skowron and Schmitt (2003). In the current study each subscale was assessed for unidimensionality using a PCA and parallel analysis (PA).

Each subscale of the DSI-R was examined with PCA ($n = 346$), and the number of factors to extract was determined with PA. The EC scale's first component had an Eigen value of 3.89, which exceeded the first PA predicted Eigen value of 1.31 by a factor of 2.97. The convention in IRT modeling is to accept the assumption of unidimensionality as tenable if the first Eigen value exceed the second by a factor of three to four (Osterlind, 2006). Therefore, the EC subscale was accepted as unidimensional. It should be noted that PA indicated that two components should be extracted, but there is some evidence in the literature that PA may overextract components (Thompson, 2006).

The ER subscale's first component had an Eigen value of 4.12, which surpassed the first PA predicted Eigen value of 1.30 by a factor of 3.17. Therefore, the ER subscale was

accepted as unidimensional. The IP subscale's first component had an Eigen value of 3.14, which exceeded the first PA predicted Eigen value of 1.30 by a factor of 2.42. The IP subscale, however, was considered unidimensional based on theoretical components and on the fact that the first component dominated the second in terms of Eigen value and percent of variance explained (28.6% versus 13.1%). The FO subscale's first component had an Eigen value of 3.53, which exceeded the first PA predicted Eigen value of 1.31 by a factor of 3.00. Therefore, the FO subscale was accepted as unidimensional.

The assumption of local independence indicates that each item of the scale must be approached by the reader as a unique attempt to measure the latent trait. Essentially, each item of the DSI-R should be answered without influence from other items in the scale. The items of the DSI-R are considered to be locally independent. Because of the self-report nature of the questions, reporting a particular score on an item is unlikely to inform your responses on other items.

Development of the DSI-SF. The DSI-SF was created by selecting the items from the DSI-R that demonstrated significant information and discrimination between categories. After using the GRM the model fit was assessed. To assess the fit of the model to each scale and item in this step both χ^2 and RMSEA were used and are reported. χ^2 is the base goodness of fit index but has been shown to be vulnerable to effects of non-normality, sample size, and restriction of range Hu and Bentler (1999). The use of RMSEA was included as an alternative, and more resilient, fit index.

Items were chosen based on their level of discrimination and difficulty as modeled by the Item Characteristic Curve (ICC). Though the GRM was a poor fit for the EC subscale

32

$(\chi^2(231) = 278.11, p=.018)$ several items had good ICCs (Figure 1). In addition, the RMSEA of the scale indicated that the GRM was a good fit for the data (RMSEA = .024). In the EC subscale, Items 3, 5, and 8 were chosen based on their ICC graphs. In addition to their excellent ICCs items, Items 3 $(\chi^2(17) = 20.0, p=.274;$ RMSEA = .023) and 8 $(\chi^2(18) = 18.3,$ $p=.435;$ RMSEA = .007) also demonstrated good fit to the data via the GRM model. Item 5 did not have a good fit to the data with respect to the χ^2 test $(\chi^2(18) = 30.4, p=.034)$ but demonstrated good fit via other measures of goodness of fit (RMSEA = .045) and had an excellent ICC. Despite the absence of good fit to the data I chose to include Item 5 because I wanted three items for the composite scale and Item 5 was the best item of the rest of the EC scale.
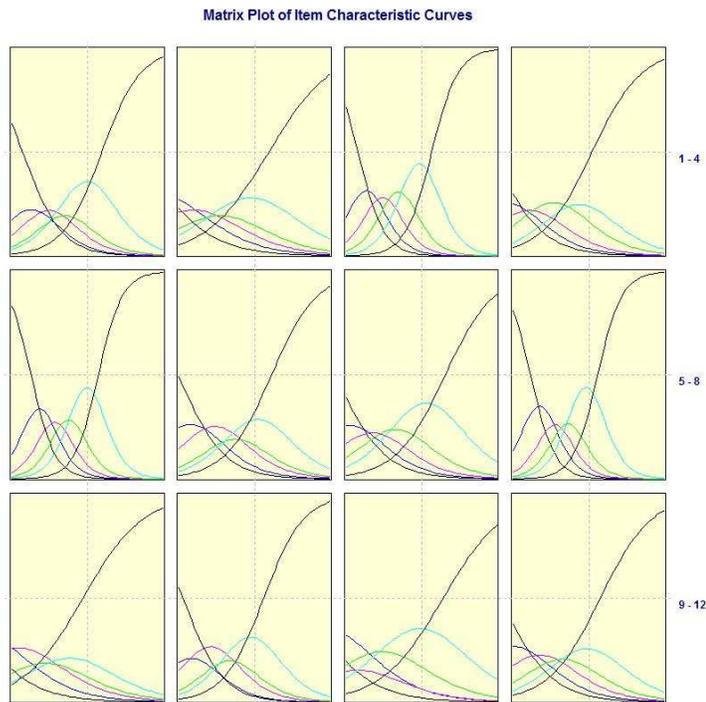

Figure 1: Study 1 EC ICC Graphs 1

33

The GRM was also a poor fit, overall, for the ER subscale according to the χ^2 analysis ($\chi^2(258) = 398.96$, $p < .001$). The RMSEA of the scale, however, indicated a good fit to the data (RMSEA = .040) and, like the EC subscale, several items had excellent ICC curves (Figure 2). Items 4, 5, 6, 7, 8, and 9 of the ER subscale were retained based on their ICC curves. Item 4 had a good fit to the data in the GRM model ($\chi^2(21) = 25.6$, $p=.223$; RMSEA = .025) as did Item 6 ($\chi^2(21) = 24.3$, $p=.277$; RMSEA = .033), Item 7 ($\chi^2(26) = 35.7$, $p=.097$; RMSEA = .021), and Item 8 ($\chi^2(24) = 27.7$, $p=.274$; RMSEA = .069). Item 5 did not have a good fit to the data with respect to the χ^2 analysis ($\chi^2(22) = 58.7$, $p < .001$) and neither did Item 9 ($\chi^2(21) = 35.9$, $p=.022$); both items were retained, however, because the RMSEA values indicated a good fit to the data (RMSEA = .021 and RMSEA = .045 respectively) and because of the characteristics of their ICC. The IP subscale also had poor overall fit with the GRM as indicated by the χ^2 analysis ($\chi^2(273) = 435.22$, $p<.001$), yet, the RMSEA (.041) indicated a good fit to the data. In addition, several items had desirable ICC curves (Figure 3). Items 1, 2, 3, 6, 9, and 11 were retained for the IP subscale. Item 6 ($\chi^2(19) = 28.1$, $p=.082$; RMSEA = .037) and 11($\chi^2(25) = 28.0$, $p=.308$; RMSEA = .019) had clearly good fit to the data. Item 1 ($\chi^2(24) = 38.3$, $p=.032$; RMSEA = .041), Item 3 ($\chi^2(27) = 40.5$, $p=.046$; RMSEA = .038), Item 2 ($\chi^2(19) = 38.4$, $p=.005$; RMSEA = .054), and Item 9 ($\chi^2(27) = 44.2$, $p=.020$; RMSEA = .042) had poor fit as indicated by the χ^2 analysis but good fit with respect to the RMSEA values. Due to software limitations a goodness of fit test was unable to be conducted for the FO subscale. The item selection for the FO subscale was conducted based on the ICC curves. The items were selected for the scale if the ICC curve indicated clear item

discrimination and a range of difficulties represented. Items 1, 3, 4, 6, and 10 were retained for the FO subscale (Figure 4).
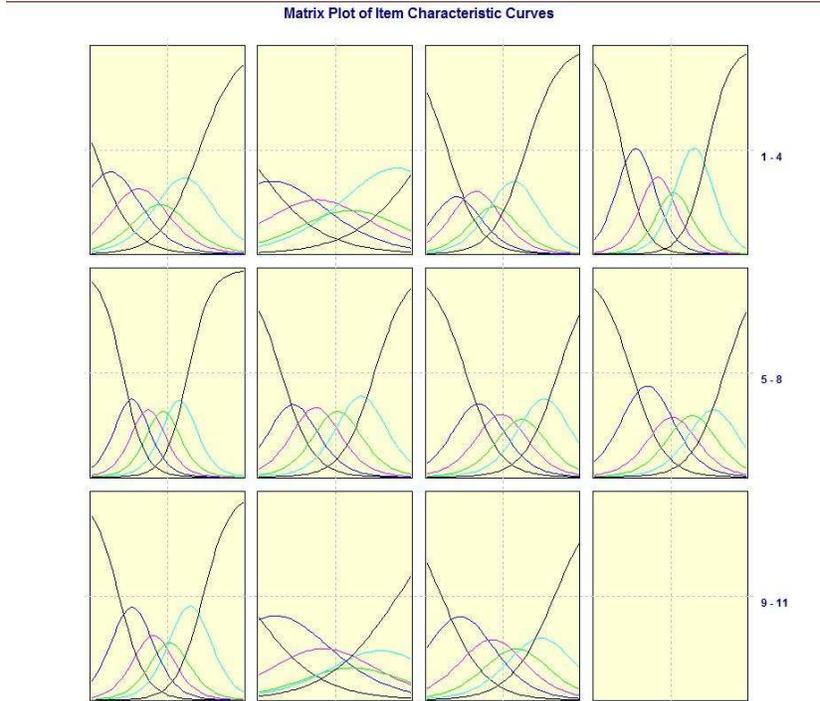

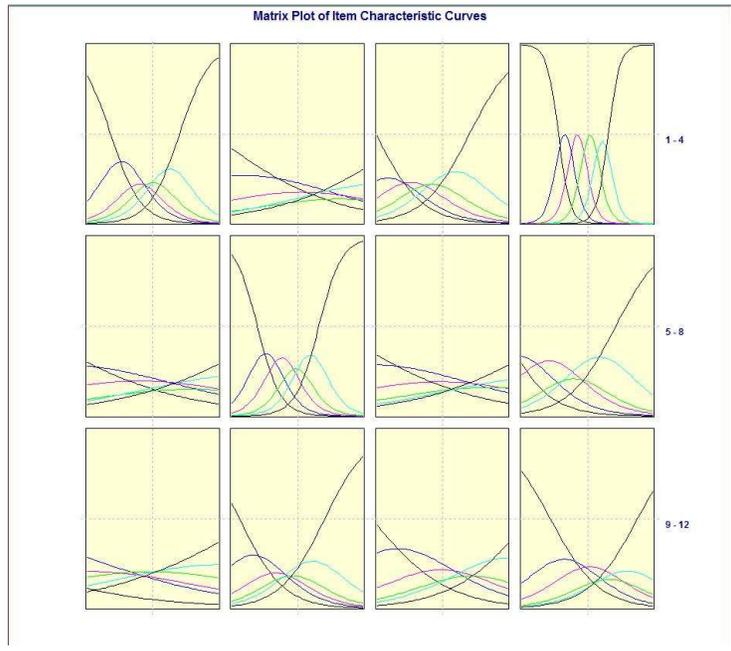Figure 2: Study 1 ER ICC Graphs
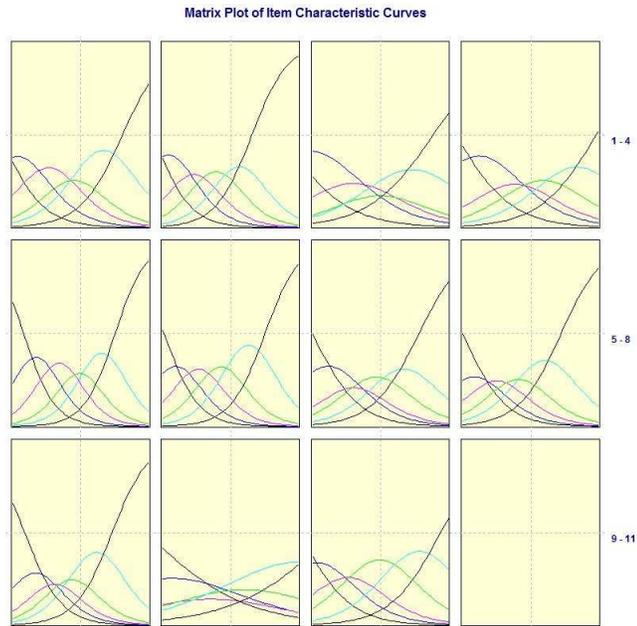
Figure 3: Study 1 FO ICC Graphs

Figure 4: Study 1 IP ICC Graphs

Each item was chosen based on the estimate a certain level of ability as demonstrated by the distinctness of the threshold parameters and height of the peaks of the IIC. The result of the analysis resulted in a 20 item scale with four subscales: EC (3 items; $M = 4.73$, $SD = 1.19$, $Min = 1$, $Max = 6$), ER (6 items; $M = 3.64$, $SD = 1.14$, $Min = 1$, $Max = 6$), FO (5 items; $M = 4.31$, $SD = .99$, $Min = 1$, $Max = 6$), and IP (6 items; $M = 4.15$, $SD = .84$, $Min = 1$, $Max = 6$). Each subscale was assessed for reliability using the sample to support the selection of the items. The EC ($\alpha = .81$; marginal reliability $= .84$) and ER ($\alpha = .84$; marginal reliability $= .89$) subscales had good internal consistency. The IP ($\alpha = .72$; marginal reliability $= .79$) and FO ($\alpha = .74$; marginal reliability $= .86$) subscales had moderate internal consistency. The DSI-SF Full scale score had an internal consistency estimate of ($\alpha = .89$). The DSI-SF can be seen in Appendix A.

The Full Scale Score. Differentiation of self, as defined by Skowron and Friedlander (1998) is a composite of ER, FO, EC, and the ability to maintain an IP. Thus, each of the subscales may be used to assess a particular aspect of differentiation of self and an average of the subscales together presents an estimation of the overall level of differentiation of self.

The full scale score of the DSI-R was not assessed using the GRM due to the inherent violation of the unidimensionality assumption. In order to support previous uses of the DSI, a full scale score is proposed using an average of the subscale scores. Estimating the DSI-SF – Full scale score in this way has the benefit of providing a full scale score represents the weighted contribution of each subscale. Although not assessed using the GRM, the full scale score will be used in subsequent analyses in order to provide consistency with the previous versions of how the DSI and DSI-R have been traditionally used. However, it should be

noted that the full scale score is has not been structurally supported through independent analysis.

Discussion of Study 1

The structure of the DSI-SF was created using the GRM. Though the GRM for the scales did not demonstrate a good fit to the sample data the scales demonstrated good internal consistency and good marginal reliability. Demars (2005) indicated that the χ^2 test of model fit are overly sensitive to Type I error. In the case of the DSI-SF this means that the χ^2 test of fit, indicating that the model did not fit sample data, may be inaccurately asserting a miss-fit. The items for each subscale were selected based on their content and the characteristics of the ICC. Items that fit with the content of the selected scale along with distinct (e.g. minimally overlapping) discrimination parameters and category thresholds that spanned the differentiation of self spectrum were preferred over other items. The DSI-SF was reduced significantly from 46 items to 20 items while retaining the four subscale structure of the original scale. The limitations for this study along with further application are discussed in the following chapter.

CHAPTER 3

STUDY 2

Method of Study 2

Participants. The purpose of the second study was to demonstrate the construct, convergent, and concurrent criterion validity of the DSI-SF. A sample of 3000 college students was randomly solicited from a moderately sized Midwest university. The participants completed an online instrument containing several scales.

The age of the selected participants ranged from 18 to 77 ($M = 25.84$, SD not available due to reporting limitations by the agency that facilitated data sampling). There were 1327 men (44.2%) and 1670 women (55.8%). The sex of 3 students could not be verified (.001%). The ethnicity of the solicited sample was primarily Caucasian ($n = 1836$, 61.2%), then African American ($n = 303$, 10.1%), Asian or Pacific Islander ($n = 177$, 5.9%), Hispanic, Latino (a) ($n = 129$, 4.3%), and then Native American ($n = 21$, .7%). Of the solicited sample 529 (17.6%) chose not to answer this question. In the solicited sample 1918 (63.9%) of the sample were undergraduate students and 1082 (36.1%) were graduate students.

A demographic questionnaire was used to gather information about participant's age, ethnicity, gender, sexual orientation, and student status (i.e. undergraduate year, or graduate student). Of the 3000 solicited participants 634 (21.1%) chose to respond. Of the 634 participants in the study 39 were removed due to large amounts of missing data bringing the total to 595 participants. The 39 participants completed the demographic section of the instrument but did not complete any of the assessment instruments. The demographic

information indicated that men were slightly more likely to not complete the survey (51.3%) than women. Out of the 39 participants that didn't respond the majority were Caucasian ($n = 29$, 74.4%) then Asian ($n = 7$, 17.9%), African American ($n = 2$, 5.1%), and then a single participant that identified as "Other" (2.6%). The mean age of the 39 participants was 24.44 ($SD = 9.66$).

Of the 595 participants that remained the age of the sample ranged from 18 to 62 ($M = 27.04$, $SD = 9.29$). There were 202 men (33.9%) and 392 women (65.9%). One participant declined to report sex. The ethnicity of the sample was primarily Caucasian ($n = 402$, 67.7%), then Asian or Pacific Islander ($n = 72$, 12.1%), African American ($n = 52$, 8.8%), "Other", including multi-racial/multi-ethnic identified participants ($n = 48$, 8.1%), Hispanic, Latino(a) ($n = 20$, 3.4%). Of the participants in the sample, one chose not to answer this question. In the sample 318 (53.4%) were undergraduate students and 277 (46.6%) were graduate students.

A χ^2 analysis indicated that the collected sample contained significantly fewer men than the solicited sample ($\chi^2(1) = 25.0$, $p < .001$). Analysis also indicated that the collected sample contained significantly more Caucasian ($\chi^2(1) = 35.5$, $p < .001$), and Asian or Pacific Islander ($\chi^2(1) = 52.2$, $p < .001$) participants than the solicited sample. Another χ^2 analysis indicated that the collected sample did not contain significantly more African American ($\chi^2(1) = .2$, $p < .655$) or Hispanic ($\chi^2(1) = .538$, $p < .463$) participants than the solicited sample. The collected sample contained significantly more graduate students than the solicited sample ($\chi^2(1) = 28.2$, $p < .001$).

A χ^2 analysis was also conducted to determine the similarity of the sample of this study to the sample in Study 1. The χ^2 analysis indicated that the collected sample contained significantly fewer men than the sample in Study 1 ($\chi^2(1) = 26.0, p < .001$). Analysis also indicated that the current sample contained significantly fewer African American students ($\chi^2(1) = 10.53, p = .001$) and significantly more Asian or Pacific Islander ($\chi^2(1) = 64.81, p < .001$) students than the sample in Study 1. Another χ^2 analysis indicated that the collected sample did not contain significantly more Caucasian ($\chi^2(1) = .11, p = .742$), Hispanic ($\chi^2(1) = .002, p = .963$), or students that identified as Other ($\chi^2(1) = 2.32, p = .128$) than the Study 1 sample.

Instruments. The *Perceived Stress Scale* (PSS) was developed by Cohen, Kamarck and Mermelstein (1983). The measure assesses perceived stress using 14 items such as: *In the last month, how often have you been upset by something that happened unexpectedly?* Each item is rated on a Likert type scale ranging from 0 (*never*) to 4 (*very often). Higher* values on the PSS indicate a higher level of perceived stress. The original internal reliability estimates of the PSS were between .84 and .86. (Cohen et al.,1983). The PSS has also been used in other studies that have reported internal consistency coefficients ranging from .83 to .91 (Murdock & Gore, 2004; Weekes et al., 2005). The demographic questionnaire used in study 2 can be found in Appendix B.

Higher scores on the PSS were found to be significantly related to increased trait and state anxiety in a sample of college students (Isyanov & Calamari, 2004). Miczo (2004) found that the PSS was positively related to loneliness in college students. These studies support the use of the PSS in a college student sample.

In this study the PSS had a mean of 17.70 (SD = 6.12; Min = 3; Max = 35). The internal consistency of the PSS in the current study was α = .82. The PSS was examined with PCA (n = 352), and the number of factors to extract was determined with PA. The PSS's first component had an Eigen value of 4.5, which exceeded the first PA predicted Eigen value of 1.35 by a factor of 3.3. The results of this analysis indicate that the factor structure hypothesized by Cohen et al. (1983) is consistent with the factor structure of the PSS in the current sample.

The *Level of Differentiation of Self Scale* (LDSS; Haber, 2003) is a unidimensional scale that assesses differentiation of self. The scale has 24 items that measure a participant's responses on a 4 point scale ranging from 1 (strongly disagree) to 4 (strongly agree). Higher scores indicate more differentiation of self. Sample items include *I am capable of helping myself when I am in crisis* and *I am emotionally mature*. Miller et al. (2004) reported that the LDSS has good internal consistency (α = .90). Haber (2003) supported the construct validity of the instrument by demonstrating that the LDSS has negative relationships with chronic anxiety, acute anxiety, and dysfunction in an adult population.

In this study the LDSS had a mean of 76.86 (SD = 9.39; Min = 50; Max = 96). The internal consistency of the LDSS in the current study was α = .91. The LDSS was examined with PCA (n = 483), and the number of factors to extract was determined with PA. The LDSS's first component had an Eigen value of 7.80, which exceeded the first PA predicted Eigen value of 1.42 by a factor of 5.5. The results of this analysis indicate that the factor structure hypothesized by Haber (2003) is consistent with the factor structure of the LDSS in the current sample.

State-Trait Anxiety Inventory Form Y (STAI-Y; Spielberger, 1983). The STAI

consists of two subscales state and trait anxiety each with 20 items measured on a four point

scale ranging from 1 (*Not at All*) to 4 (*Very Much So*). Higher scores indicate more anxiety.

This study will make use of both subscales in order to assess both chronic and acute anxiety.

The trait anxiety subscale will be used to assess the participant's level of chronic anxiety.

The trait anxiety subscale asks participants to evaluate how they feel "generally" and assesses

chronic anxiety with items like *I am a steady person* and *I lack self-confidence*. The state

anxiety subscale will be used to assess the participant's level of acute anxiety. The state

anxiety subscale asks participants to evaluate how they feel "right now, at this moment" and

assesses acute anxiety with items such as *I feel at ease* and *I feel upset*. The STAI subscales

have strong internal consistency of .93 for the trait subscale and .95 for the trait subscale

(Grös, Antony, Simms, & McCabe, 2008). The STAI has demonstrated convergent validity

through association with other measures of anxiety (Grös et al. 2008).

Several studies provide evidence for valid interpretation of the STAI in college

students. Mathews, Kaur, and Stein (2008) trait anxiety was associated with a history of

emotional abuse and neglect in childhood and obsessive compulsive disorder in adulthood.

Higher levels of anxiety on the STAI have also been associated with increased levels of

worry, a faster response time to computer stimulus when compared to individuals with low

anxiety, and symptoms of obsessive compulsive disorder (Mathews et al., 2004). Wray and

Stone (2005) found that higher anxiety scores on the STAI were associated with lower levels

of self-esteem.

In this study the STAI-State scale had a mean of 35.9 (*SD* = 11.05; *Min* = 20; *Max* = 78). The internal consistency of the STAI-State Scale in the current study was α = .93. The STAI-Trait scale had a mean of 38.22 (*SD* = 10.00; *Min* = 20; *Max* = 70) with an internal consistency estimate of α = .92. The STAI-State was examined with PCA (*n* = 550), and the number of factors to extract was determined with PA. The STAI-State's first component had an Eigen value of 8.89, which exceeded the first PA predicted Eigen value of 1.35 by a factor of 6.6. A separate analysis was conducted for the STAI-Trait but the results were similar to the STAI-State with the first component (Eigen value = 8.18) exceeding the first PA predicted Eigen value of 1.35 by a factor of 6.1. The results of this analysis indicate that the factor structure hypothesized in the construction and validation of the STAI (Grös et al. 2008) is consistent with the factor structure of the STAI in the current sample.

The Rosenberg Self-Esteem Scale (RSE; Rosenberg, 1965) is a 10 item self-report instrument used to assess global self-esteem. Each of the 10 items are measured on a 4 point Likert type scale ranging from 1 (*strongly agree*) to 4 (*strongly disagree*). The scores are summed with lower scores indicating more self-esteem. Sample items include *I feel that I'm a person of worth, at least on an equal plane with others* and *I feel that I have a number of good qualities.* The RSE has a reported internal consistency ranging from .60 (Cohen, Mansoor, Langut, & Lorber, 2007) to .92 (Rosenberg, 1965). The RSE has been associated with stronger identity in older adults, higher differentiation of self, increased quality of life and less depressed mood, supporting the construct validity of the instrument (Chung & Gale, 2006; Cohen et al., 2007; Whitbourne & Collins, 1998).

In a college student population the RSE has been associated with higher levels of narcissism, perceived fit between a job and self interest, and increased self-efficacy with technology (Dineen, Ash, & Noe, 2002; Zeigler-Hill, 2006). Wray and Stone (2005) found that higher self-esteem, as measured by the RSE, was associated with the ability to take risks and lower anxiety in college students. Brewin and Furnham (1986) lower self-esteem as measured by the RSE was associated with perceptions that failure was attributed to external factors and positive outcomes were attributed to internal factors.

In this study the RSE had a mean of 23.13 ($SD = 5.46$; $Min = .00$; $Max = 30$). The internal consistency of the RSE in the current study was $\alpha = .90$. The RSE was examined with PCA ($n = 535$), and the number of factors to extract was determined with PA. The RSE's first component had an Eigen value of 5.46, which exceeded the first PA predicted Eigen value of 1.22 by a factor of 4.5. The results of this analysis indicate that the factor structure hypothesized by Rosenberg (1965) is consistent with the factor structure of the RSE in the current sample.

The Center for Epidemiologic Studies Depression scale (CES-D; Radloff, 1977) is a 20 item scale that measures self-reported symptoms of depression. Each item is rated on a scale according to how often a person has experienced the item in the past week. The scale ranges from 0 (*rarely or none of the time*) to 3 (*most or all of the time*). An example item is *I felt depressed*. Higher scores on the CES-D indicate more depressive symptoms.

Radloff (1977) reported internal consistency coefficients ranging from .84 to .90. Other reports of internal consistency for the measure range from .89 to .97 (Gatz, Pedersen, Plomin, Nesselroade, & McClearn, 1992; Rintala, Young, Hart, & Fuhrer, 1994) reported an

internal consistency coefficient for the full CES-D scale of .97. Lewinsohn, Hoberman, and

Costello and Devins (1989) found that the CES-D was able to differentiate between clinically

depressed women and non-depressed women attending a family physician.

In this study the CESD had a mean of 12.71 ($SD = 9.98$; $Min = 0$; $Max = 52$). The

internal consistency of the CESD in the current study was $\alpha = .92$. The CESD was examined

with PCA ($n = 490$), and the number of factors to extract was determined with PA. The

CESD's first component had an Eigen value of 8.11, which exceeded the first PA predicted

Eigen value of 1.37 by a factor of 5.9. The results of this analysis indicate that the factor

structure hypothesized by Radloff (1977) is consistent with the factor structure of the CESD

in the current sample.

Results of Study 2

The purpose of Study 2 was to provide evidence of the construct, convergent, and

concurrent criterion validity of the DSI-SF. First, the structure of the DSI-SF was confirmed

through a repeated analysis using the GRM .Evidence of concurrent criterion validity was

then found by relating the DSI-SF to measures of depression, self esteem, trait anxiety (i.e.

acute anxiety), state anxiety (i.e. chronic anxiety), perceived stress. Evidence of convergent

validity is provided by relating the DSI-SF to the LDSS. Means and standard deviations of all

scales and subscales included in Study 2 can be found in Table 2.

Unidimensionality. Before applying the GRM to the DSI-SF subscales each subscale

was assessed for unidimensionality. A PCA was conducted on each subscale, and the Eigen

values compared to predicted values produced by a PA. Out of the 595 original participants

119 were eliminated for this analysis due to missing data on one or more items of the DSI-

SF. A total of 476 participants were used in this analysis.

Table 2

Means and Standard Deviations
of Scales used in Study 2

Measures	M	SD
1. EC	4.39	1.24
2. ER	3.62	1.04
3. FO	4.15	0.95
4. IP	4.42	0.79
5. DSI-Full	4.15	0.77
6. PSS	17.70	6.12
7. STAI-S	35.90	11.05
8. STAI-T	38.22	10.00
9. CESD	12.71	9.98
10. RSE	23.13	5.46
11. LDSS	76.86	9.39

The PCA indicated that the EC subscale only had one Eigen value over 1.0 which is a

traditional level of significance to identify a component (Warner, 2008). The first component

had an Eigen value of 2.14 and the Eigen value of the second component was .58. Therefore,

a PA was deemed unnecessary and the EC scale was accepted as unidimensional. The factor

loadings for the EC items can be seen in Table 3. Similarly the PCA indicated that the ER

subscale's first Eigen value was 3.04 and the Eigen value of the second component was .80.

Therefore, only one component was extracted and the ER scale was accepted as

unidimensional. The factor loadings for the ER items can be seen in Table 4. The PCA

47

indicated that the FO subscale's first component Eigen value was 2.23 and the Eigen value of the second component was .88. Therefore, only one component was extracted and the FO scale was accepted as unidimensional. The factor loadings for the FO items can be seen in Table 5.

Table 3

Factor Loadings for the EC Subscale (n = 436)

Item	Scale 1 Factor Loadings
1	0.898
2	0.861
3	0.770

Note: Only one factor was extracted.

Table 4

Factor Loadings for the ER Subscale (n = 436)

Item	Scale 1 Factor Loadings
1	0.503
2	0.495
3	0.527
4	0.406
5	0.545
6	0.563

Note: Only one factor was extracted.

Table 5

Factor Loadings for the FO Subscale (n = 436)

Item	Scale 1 Factor Loadings
1	0.585
2	0.566
3	0.796
4	0.644
5	0.719

Note: Only one factor was extracted.

The IP subscale, however, did not follow the same pattern. The factor analysis indicated that the first factor's Eigen value was 2.489 and the second factor's Eigen value was 1.085. The PA predicted Eigen values were 1.15 and 1.08 respectively. The first factor's Eigen value clearly exceeded the predicted Eigen value. The second factor's Eigen value also exceeded the second factor's predicted Eigen value. The second factor's Eigen value of 1.085, however, was within 1 standard deviation of the second factor predicted Eigen value of 1.081 (SD=.0258) prompting further investigation. The PCA results revealed that the first factor of the IP subscale accounted for 41.5% of the variance whereas the second factor accounted for just 18.1% of the variance. This proportion of variance accounted for is consistent with the FO subscale which had 44.5% and 17.7% respectively. Thus, the IP subscale was considered to be unidimensional for the GRM analysis. The factor loadings for the EC items can be seen in Table 6.

Table 6

Factor Loadings for the IP Subscale (n = 436)

Item	Scale 1 Factor Loadings	Scale 2 Factor Loadings
1	0.839	0.096
2	0.018	0.804
3	0.642	0.122
4	0.248	0.725
5	0.193	0.638
6	0.829	0.262

Note: Though two factors are shown only one factor was extracted and confirmed by a parallel analysis.

GRM. The EC subscale ($\chi^2(57) = 290.6$, $p < .001$; RMSEA = .093) did not fit the

data as well in the second study as it did in the first study (as indicated by the RMSEA

difference between study 1 and study 2). The RMSEA value for the EC subscale indicates a

more poor fit to the data, yet, the value may still represent a marginal fit to the data (RMSEA

$< .1$).

The ER subscale ($\chi^2(161) = 221.0$, $p = .001$; RMSEA = .028), FO subscale ($\chi^2(129) =$

265.5, $p < .001$; RMSEA = .047), and IP subscale ($\chi^2(140) = 292.7$, $p < .001$; RMSEA =

.048) show the pattern that the χ^2 analysis indicates poor fit but the RMSEA values indicate

good fit for the subscales. This is consistent with the original construction of the subscales

from the DSI-R.

The subscale distributions were as follows: EC ($M = 4.39$, $SD = 1.24$, $Min = 1$; $Max =$

6), ER ($M = 3.62$, $SD = 1.04$, $Min = 1$; $Max = 6$), FO ($M = 4.15$, $SD = .95$, $Min = 1.2$; $Max =$

6), IP ($M = 4.42$, $SD = .79$, $Min = 1.83$; $Max = 6$), DSI-SF-Full ($M = 4.15$, $SD = .77$, $Min = 1.95$; $Max = 5.77$). The distribution descriptions indicate that there is a restricted range of reported levels of differentiation of self for the IP scale. This could impact the accuracy of the estimates produced through IRT and the fit of the model to the data. The total item information curves were assessed (Figures 5 through 8).

The total item information (TII) curves combine the items to determine where on the ability spectrum the subscale is most accurate. The TII curves of the DSI-SF subscales indicate how accurate the subscale would be for a person with a given level of differentiation of self. Remember that in IRT the subscales are assessed on the same spectrum as individuals, and that the estimate of ability is symbolized with θ. Thus, a subscale is accurate with a range of θ with θ being a standard normal distribution with a mean of 0 and a standard deviation of 1.

The TII curve indicated that the EC subscale is most accurate for individuals with differentiation of self scores (θ) that are -2.3 standard deviations below the mean to +1.5 standard deviations above the mean (Figure 5). The SEM of the scale is lowest between these two ability points indicating the highest accuracy (lowest error) of the scale. Similarly, the SEM is lowest for the ER subscale between -2.5 to +2.1 standard deviations (Figure 6) indicating a wide range of accuracy. The FO subscale was most accurate between the -3.0 to +1.75 range of differentiation of self, as determined by the range where the SEM is lowest (Figure 7). Like the FO subscale the IP subscale was most accurate with lower levels of differentiation of self with the most accuracy occurring between -3.0 and 1.5 standard deviations of the mean with the SEM being low between these two markers (Figure 8).

51
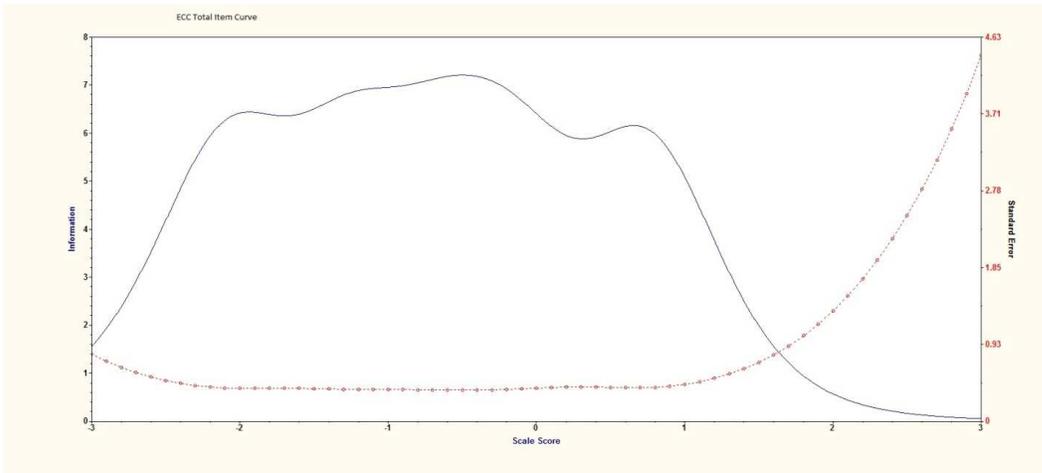
Figure 5: EC Total Information Curve 1
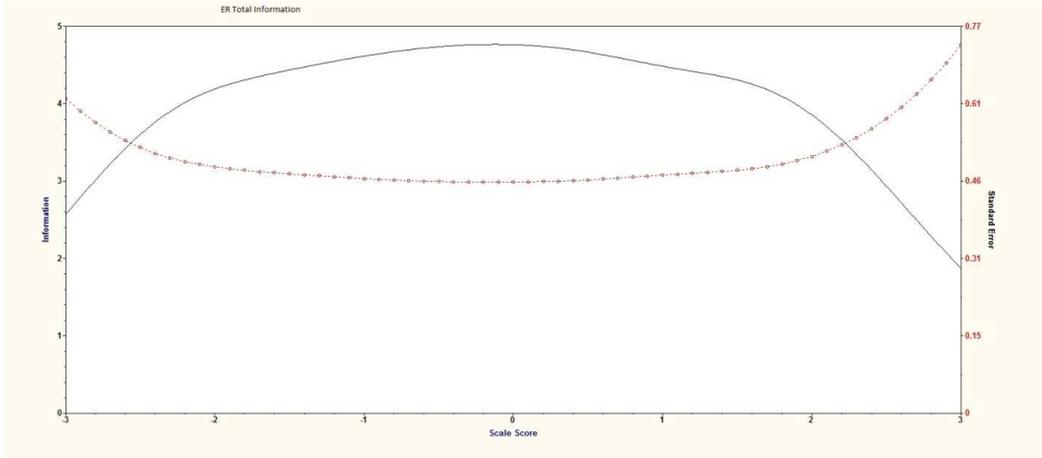
Figure 6: ER Total Information Curve 1
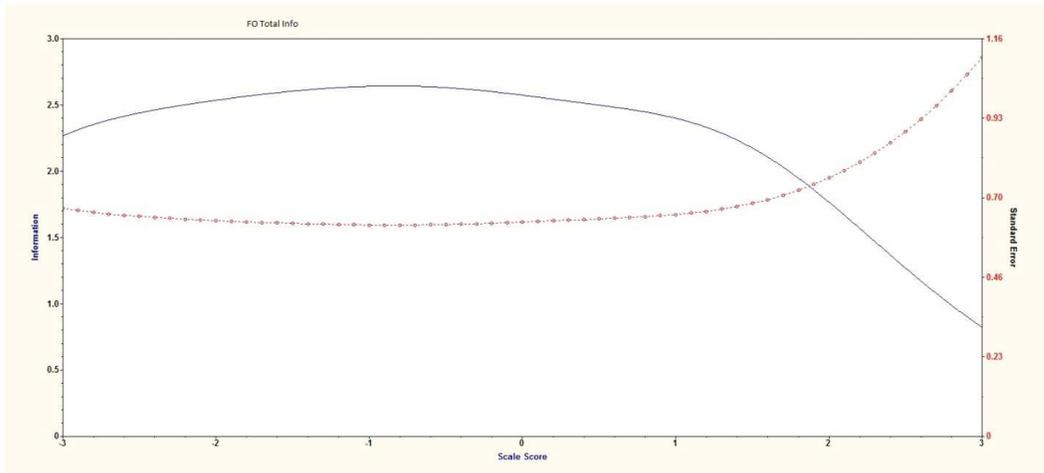
Figure 7: FO Total Information Curve 1

Figure 8: IP Total Information Curve

Reliability. Traditional reliability constructs such as internal consistency are based in Classical Test Theory (CTT). Henard (2000) suggests that although IRT is superior in some ways, the information gained through an IRT analysis should be used in conjunction with traditional estimates of test characteristics derived from CTT models. Thus, internal

consistency estimates were one method used to assess the reliability of the DSI-SF in the college sample. The EC subscale (3 items) had a moderate internal consistency coefficient (α = .79). The ER subscale (6 items) had a good internal consistency coefficient (α = .8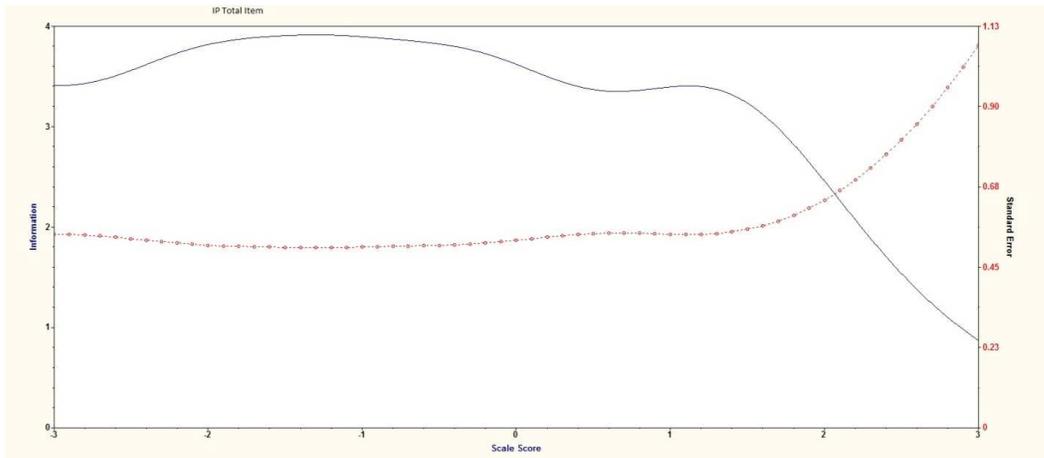0). The FO subscale (5 items) had a poor internal consistency coefficient (α = .68). The IP subscale (6 items) had a moderate internal consistency coefficient (α = .70). The DSI-SF-Full scale, however, had a very good internal consistency coefficient (α = .88). The internal consistency estimates are shown in Table 2.

Researchers developed a similar type of assessment of reliability for use with IRT models. The marginal reliability of a subscale indicates the average of error across all levels of ability measured by the subscale. The marginal reliabilities were good for all four subscales (EC = .85, ER = .83, FO = .74, and IP = .84).

Convergent Validity. Bivariate Pearson correlations were used to assess the relationship between the DSI-SF full scale score, subscales, perceived stress, symptoms of depression, state anxiety, trait anxiety, general self-esteem, and the LDSS. Out of the 595 potential participants only 385 completed all of the measures. Of the 261 participants that were eliminated most were women (62.2%) and identified as Caucasian (n = 155, 59.4%), Asian (n = 37, 14.2%), African American (n = 25, 9.6%), Hispanic (n = 11, 4.2%), Other (n = 6, 2.3%), and Multiracial (n = 15, 5.7%), some participants chose not to report their ethnicity (n = 12, 4.6%).

Data from 385 participants were used in the following analyses. The results of the correlation analysis supported the criterion validity of the DSI-SF in a college sample. Table 7 displays the correlation matrix between the subscales of the DSI-SF and other measures

used in the following analysis. The IP subscale was negatively related to stress ($r = -.60$, $p < .001$), symptoms of depression ($r = -.46$, $p < .001$), state anxiety ($r = -0.51$, $p < .001$), and trait anxiety ($r = -0.68$, $p < .001$). The IP subscale was positively related to general self-esteem ($r = .56$, $p < .001$). The EC subscale was also negatively related to stress ($r = -.37$, $p < .001$), symptoms of depression ($r = -.44$, $p < .001$), state anxiety ($r = -.35$, $p < .001$), and trait anxiety ($r = -.45$, $p < .001$). The EC subscale was also positively related to general self-esteem ($r = .40$, $p < .001$). The ER subscale was negatively related to stress ($r = -.56$, $p < .001$), symptoms of depression ($r = -.51$, $p < .001$), state anxiety ($r = -.46$, $p < .001$), and trait anxiety ($r = -.63$, $p < .001$). The ER subscale was positively related to general self-esteem ($r = .46$, $p < .001$). The FO subscale was negatively related to stress ($r = -.51$, $p < .001$), symptoms of depression ($r = -.46$, $p < .001$), state anxiety ($r = -.46$, $p < .001$), and trait anxiety ($r = -.57$, $p < .001$). The FO subscale was positively related to general self-esteem ($r = .46$, $p < .001$).

Table 7

Summary of Intercorrelations for the DSI-SF and Criterion Variables. ($n = 385$)

Measures	1	2	3	4	5	6	7	8	9	10
1. EC	-									
2. ER	0.32*	-								
3. FO	0.35*	0.67*	-							
4. IP	0.24*	0.58*	0.51*	-						
5. DSI-Full	0.69*	0.82*	0.82*	0.71*	-					
6. PSS	-0.33*	-0.56*	-0.51*	-0.60*	-0.66*	-				
7. STAI-S	-0.35*	-0.45*	-0.46*	-0.51*	-0.58*	0.72*	-			
8. STAI-T	-0.45*	-0.63*	-0.57*	-0.68*	-0.75*	0.82*	0.77*	-		
9. CESD	-0.44*	-0.51*	-0.46*	-0.46*	-0.68*	0.72*	0.69*	0.78*	-	
10. RSE	0.40*	0.46*	0.46*	0.56*	0.61*	-0.64*	-0.58*	-0.77*	-0.70*	-
11. LDSS	0.22*	0.45*	0.61*	0.52*	0.57*	-0.48*	-0.40*	0.54*	-0.49*	0.54*

Note. For all scales higher scores indicate more extreme responding in the direction of the construct assessed. EC = Emotional Cutoff scale; ER = Emotional Reactivity scale; FO = Fusion with Others scale; IP = I Position scale; DSI-Full = Differentiation of Self Inventory - Short Form Full Scale Score; PSS = Perceived Stress Scale; STAI-State = State Trait Anxiety Inventory - State scale; STAI-Trait = State Trait Anxiety Inventory - Trait scale; CESC = Center for Epidemiologic Studies Depression scale; RSE = Rosenberg Self Esteem scale; LDSS = Level of Differentiation of Self scale. * = significant at the p < .001 level.

The criterion validity of the DSI-SF-Full scale was also supported in this sample. The DSI-SF-Full was negatively relationship to stress ($r = -.66$, $p < .001$), symptoms of depression ($r = -.62$, $p < .001$), state anxiety ($r = -.57$, $p < .001$), and trait anxiety ($r = -.75$, $p < .001$). The DSI-SF-Full scale, like the subscales, was positively related to general self-esteem ($r = .61$, $p < .001$).

The IP subscale had a positive relationship with the Levels of Differentiation of Self Scale ($r = .52$, $p < .001$), as does the EC subscale ($r = .22$, $p < .001$), ER subscale ($r = .45$, $p < .001$), and FO subscale ($r = .61$, $p < .001$). Supportive evidence for convergent validity for the DSI-SF-Full was also found for the college sample with a positive relationship between the DSI-SF-Full and the Levels of Differentiation of Self Scale ($r = .57$, $p < .001$).

Discussion of Study 2

The GRM did not provide strong evidence for the structural validity of the DSI-SF. The reliability information and convergent validity assessment both provided supportive evidence for the use of the DSI-SF. The DSI-SF retained a remarkable level of internal consistency while drastically increasing the efficiency of the scales. Intercorrelations between the DSI-SF and the other variables were not only in the hypothesized directions but had considerable strength. This study, however, was limited by the fact that the random sample differed in some ways from both the overall sample pool and the target population. In addition, the lack of evidence for the structural validity of the DSI-SF is problematic for the application of the scale. Additional research should be conducted to assess the structure of the DSI-SF.

Study 3

Method of Study 3

   Participants. A third sample was collected in order to assess the test-retest reliability of the DSI-SF. The participants were recruited, using a convenience sampling technique, from several graduate level education and counseling courses at a moderately sized Midwestern university. A total of 51 participants returned completed pairs of the instrument packet. Four of these participants were removed as univariate outliers resulting in a total of 47 participants. There were 40 women (85.1%) and seven men in the sample. The age ranged from 20 to 59 ($M = 30.32$, $SD = 9.09$). There were 40 Caucasian or Euro-Americans (85.1%), three Hispanic or Latino/Latinas (6.4%), two African Americans (4.3%), one Asian or Pacific Islander (2.1%), and one participant that identified as Other (2.1%).

   Instruments. Participants completed an instrument packet containing a demographic questionnaire and the DSI-SF.

   Procedure. Participants were solicited to participate in the study during the early fall semester. Participants completed the instrument packet at Time 1. The participants were asked to complete a second instrument packet between four and five weeks later (Time 2). There was a small discrepancy in time between data collection points due to scheduling conflicts with several of the classes that were unforeseeable when the first data collection time was scheduled.

Results of Study 3

   In Study 3 the test-retest reliability was assessed for the DSI-SF. Chronbach's alpha was evaluated at times 1 and 2 for each of the subscales as well as the full scale score of the

DSI-SF. The EC subscale demonstrated moderate to good internal consistency (α_{t1}=.78 and α_{t2}=.81). The ER subscale also demonstrated moderate to good internal consistency (α_{t1}=.79 and α_{t2}=.83). The FO subscale had poor internal consistency (α_{t1}=.56 and α_{t2}=.58). The IP subscale had poor to moderate internal consistency (α_{t1}=.68 and α_{t2}=.71). The full DSI-SF scale demonstrated good internal consistency at both points in time (α_{t1}=.84 and α_{t2}=.87).

The test-retest reliability, or coefficient of stability, was calculated using a Pearson correlation between time 1 and time 2 for the full scale score and each of the subscales of the DSI-SF. b

Discussion of Study 3

The test-retest reliability information gathered in this study was supportive of the stability DSI-SF over time. The stability of the DSI-SF is congruent with the hypothesized stability of differentiation of self. The convenient sampling technique is a limitation in this study that limits the generalizability of the findings. Future studies should be conducted to replicate the current findings and expand the support for the stability of the instrument.

<div align="center">

Discussion

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Differentiation of self is a complex construct that is an important mark of development in family systems theory as well as individual personality theory. Currently, the most advanced method of measuring differentiation of self is the DSI-R (Skowron & Schmitt, 2003). A shortened form of the DSI-R that retained the psychometric strength of the original measure would be a boon to researchers.

The purpose of this research was to refine the DSI-R into a shortened version, the DSI-SF, that could be used in research with college students. Three studies each addressed a

key issue in scale development. In the first -study the DSI-SF was developed using IRT methods. In the second study evidence of reliability, content validity, concurrent criterion validity, convergent validity, was gathered for the DSI-SF. In the third -study the DSI-SF was assessed for stability over time using test-retest reliability. Finally, all three studies provide a comprehensive framework for understanding the DSI-SF.

This discussion section will be divided into several topical areas. In the first section the results from all three studies will be summarized and discussed. At the end of the first section I will discuss recommendations for use of the DSI-SF. In the second section limitations of the three studies will be discussed. In the third section areas of future research will be discussed. Finally, in the fourth section, a concluding summary will be given.

Summary of the Results

Development of the DSI-SF. The results of the first, second, and third studies paint a mixed picture of the DSI-SF. In study one the structure of the DSI-SF was developed using the GRM (Samejima, 1969; 1997). Each of the subscales to be tested was judged to be unidimensional; that is to say, that the subscales were found to measure a single trait. The GRM seemed to have a moderate fit to most of the subscales. In addition, the ICCs of each subscale, showing the distribution of each item along the subscale of its respective trait in differentiation of self, led to the selection of items that were believed to be structurally representative of the construct. The items from each subscale that were chosen were also reviewed for content to ensure that each item represented the constructs that they purported to measure. Thus, the DSI-SF was created using 20 of the "best" items that demonstrated

60

distinct parameters on the ICC curves and had consistent content. The internal consistencies of the new DSI-SF subscales, and full scale score, indicated that the subscales were reliable.

Confirmation, Reliability, and Validity. The results of the second study, however, were perplexing. Evidence of the structural validity of the scale was mixed. Again, each subscale was found to be unidimensional, via a traditional factor analysis. The IP subscale had to be analyzed at a deeper level to ensure that it was, indeed, unidimensional. The GRM of the second study, however, revealed that, again, the GRM was a moderate to good fit for the subscales. I decided not to pursue an alternative model because the GRM was, theoretically, the most appropriate model for the data. The GRM was designed for data that was polytomous (capable of having multi-level responses) as an extension of the 2-PL model for dichotomous data. In the GRM each successive level of the construct (e.g. choosing a four instead of a three) requires the respondent to fulfill the requirements of all levels of the construct before the selected level. Thus, in GRM, a person with a four on an item has as much of the latent trait (θ), and more, than a person that endorsed a three on the same item. Many factors may have contributed to the poor model fit. The skewness of the distribution for the items in the subscales, and the limited number of items in the subscales, may both have contributed to diminished goodness of fit (Forero & Maydeu-Olivares, 2009).

The summary of the structural evidence is tempered by the limited nature of the data collection and moderate model fit. The factor analysis indicated that each subscale was unidimensional, and a review of the content of each subscale revealed that each was largely singular with respect to content of the items. A positive factor analysis and content review

are traditionally considered supportive evidence. Though the structure of the DSI-SF was supported more research is needed to explore the structure of the instrument.

Despite the moderate structural evidence of the DSI-SF the subscale and full scale reliabilities proved to be good. In addition, much of the internal consistency of the original scale was preserved. The EC subscale retained 98% of its internal consistency despite retaining only 25% of the items. The ER subscale retained 95% of its internal consistency and only retained about 55% of the items. The FO subscale retained a smaller percentage of internal consistency, 92%, while retaining only 50% of the items. Finally, the IP subscale retained 97% of its internal consistency with only 45% of the items. The full scale score of the DSI-SF performed similarly with a retention of 99% of its internal consistency while retaining only 43% of the items. In study three I also established a preliminary estimate of the test-retest reliability for the full scale and each subscale. The EC and ER subscales had good test-retest reliability while the FO and IP subscales had moderate test-retest reliability. These results of the reliability analyses demonstrated that there is substantive evidence that the subscales maintained their internal consistency despite a considerable reduction in length.

After considering the weak structural support of the DSI-SF, and the moderate evidence of internal consistency and test-retest reliability, I found strong evidence of concurrent criterion validity for the scale. The intercorrelations between the ER, FO, IP subscales, the DSI-SF Full scale, and the criterion variables (e.g. perceived stress, state anxiety, trait anxiety, depression, and self-esteem) were both in the in predicted direction and had large effect sizes. The evidence for the EC subscale was weaker than for the other subscales but still in the hypothesized directions and with small to moderate effect sizes.

Thus, the results of the concurrent criterion validity analysis indicate that there is significant support for the DSI-SF.

Finally, the DSI-SF was correlated with another commonly used measure of differentiation, the LDSS, which establishes preliminary evidence of convergent validity. Each subscale of the DSI-SF, including the full scale scores, related to the LDSS positively, as hypothesized. In addition the correlations were substantial in effect size. Thus, there is some evidence supporting the convergent validity for the DSI-SF.

Summary. Taking all of the above evidence into account I would recommend the DSI-SF with caution. Although there is substantial support for the reliability, concurrent criterion validity, and convergent validity of the DSI-SF, the lack of strong structural validity is a concern. Using the DSI-SF as a research instrument would be permissible if the researchers were cognizant of the error introduced into their study by using an instrument with these reliabilities. In addition, it should be noted that the evidence supporting the DSI-SF was developed using a college aged sample. Thus, caution should be used when utilizing the DSI-SF in research with another population.

Limitations

The limitations of the overall study are best understood as a discussion of the limitations of each sub-study. There are strengths and weaknesses in each study and they will be discussed along with an overall review of the limitations of the scale. There was, however, a limitation that applied throughout the study, restriction of range.

Restriction of Range. All of the samples used were comprised of college students. It should be noted that college students may not represent the full spectrum of differentiation of

self levels, resulting in a restriction of range in DSI scores. Indeed, the sample was representative of the college student population at the institution where the sample was collected and the level of differentiation of self was positively skewed. College students might be expected to represent a higher functioning subset of the general population. Thus, the higher than average level of differentiation of self was not surprising. The restricted range of differentiation of self, along with the positive skew of the distributions for each of the subscales, has several ramifications. First, the DSI-SF should be cautiously applied to samples that could occupy lower extremes on the differentiation of self scale. In addition, error rates will increase (e.g. reliability will decrease) as people report lower levels of differentiation of self. This issue can be explored through replication studies and studies where the participants were not primarily college students.

Study 1. In Study 1 a convenience sample was used to collect data from over 350 participants. Convenience sampling technique is fast and resource- efficient. It is, however, prone to researcher and data sampling bias. The results of the study should be applied cautiously to contexts that do not match the sample frame (e.g. predominantly Caucasian, female, and college aged students). The limited number of participants that endorsed ethnicities, or races, other than Caucasian (only about 25% of the sample) indicates that more research is needed in order to generalize DSI-SF structure to other cultural contexts. Differential item functioning with respect for gender, for example, could be explored. Finally, the sample size of 352 is large enough to provide reliable estimates for the parameters with the GRM. The estimates provided by the sample, however, may only be precise over a small portion of differentiation of self (Orlando, 2004). The more limiting

factor of the sample is the limited spectrum of differentiation of self that the sample represents. Thus, the estimates gained from Study 1 may be accurate but only for a smaller range of the differentiation of self construct (Orlando, 2004). For a review of the impact of these issues see the limitations section. More participants, however, could provide new insights into the structure of the DSI-SF and allow for more accurate estimates of the parameters.

The largest limitation in Study 1, however, was the moderate support for the structure of the DSI-SF. The GRM demonstrated only a moderate fit to the data. This result may be in part because of the violation of the unidimensionality assumption of the subscales. Each of the scales could also be viewed as multi-dimensional. This may also be due to the idea that the scales might be better represented by a bi-factor model that represents the hierarchical structure of differentiation of self. In addition, though a content analysis supported the subscales the content analysis opened up the DSI-SF to researcher bias because it was conducted by a single person and based on that person's expertise of the construct. It would be fair to criticize the content of the DSI-SF based on the potential bias of the creator of the scale. More substantial research is needed to substantiate the structure of the DSI-SF.

Study 2. Study 2 sought to achieve multiple objectives including supporting the structural evidence found in Study 1, establishing estimates of internal consistency, and establishing evidenced of convergent and concurrent criterion validity. The sample in Study 2 was collected using a simple random sampling technique. The sampling technique was well implemented and resulted in a sample of over 500. Unfortunately, the obtained sample contained some significant differences in demographics from the solicited sample. These

differences could be due to chance, or they could be due to self-selection factors with respect to participating in research or exploration about the self.

Another limitation of Study 2 was the use of online data collection. Though advantageous in terms of convenience and application to a younger sample, collecting data online precludes some people from participating. Individuals with poor computer literacy skills and individuals without access to a computer (e.g. individuals with low socio-economic status) may have been excluded from the sample. In addition, only about 20% of the sample participated in the study. A response rate of only 20% is low. Although the response rate was low there were enough participants to ensure that all of the analyses had enough power. However, the power may have been diminished in detecting variations at the extreme ends of differentiation of self, as evidenced by the relatively higher SEM values at the extreme ends of the differentiation spectrum with each item. The higher SEM values may be due to the homogeneity of the sample and the positive skew of the selected items.

Study 3. In Study 3 a small sample was used to develop a preliminary estimate of the test-retest reliability of the DSI-SF. A convenience sampling technique was used in Study 3. In addition to the general limitations of a convenience sample (discussed above) the larger impact of the convenience sample was the predominance of graduate students in the sample. Although graduate students were included in the samples in Studies 1 and 2 there were also undergraduate students. The absence of undergraduate students in Study 3 limits the generalizability of the findings to samples that contain primarily graduate students. Researchers should be very cautious when attempting to apply the test-retest reliability estimates to samples that contain undergraduate students. In addition, though the estimates of

test-retest reliability were adequate, the sample was small. A larger sample will be needed to substantiate the evidence of test-retest reliability.

There was also a complication that occurred during the implementation of Study 3. The planned procedure for Study 3 was for a four week waiting period between data collection points for all students. Because the data were collected in classrooms, however, due to factors outside of the researcher's control a portion of the data was collected after five weeks and a portion was collected after four weeks. Although practically and theoretically speaking, the difference between a four and a five week test-retest reliability should be small, or insignificant, the actual effect could not be measured due to limitations in procedures. It should be noted that the test-retest reliability estimates found in Study 3 contain a higher amount of measurement error due to this inconsistency in implementation.

In Study 3 the small sample size was even further diminished by the removal of four outliers. Due to the small sample size it is difficult to tell whether the four individuals were truly outliers or if the four individuals represented true scores that would have been more numerous had there been a larger sample. Regardless, the impact of the four individuals was significant. As outliers, or as representative individuals, if they had been included they would have undue influence on the statistics due to the small overall sample size. Thus, I made the decision to remove them from the analysis.

DSI-SF Full Scale Score. The use of the full scale score of all of the iterations of the DSI should be noted as a limitation. Since the creation of the DSI series of instruments the DSI full scale score has been utilized as an overall measure of differentiation of self. There are arguments for and against the use of the full scale score to represent differentiation of

67

self. Conceptually the DSI full scale score is consistent with the theoretical structure of the components of differentiation of self. In other words, the DSI full scale score has been seen as a summary measure of the construct of differentiation of self. In addition, the theoretical foundation of differentiation proposed by Bowen (1978) supports the viewing of differentiation of self as a balance of the components that form it.

Arguments against using the full scale score are primarily psychometric. The DSI has traditionally been made of several subscales representing different constructs within the differentiation of self umbrella (i.e. fusion, individuation, emotional reactivity). The primary work by Skowron and Friedlander (1998) and Skowron and Schmitt (2003) has been to form and support the subscales. Very little psychometric attention has been paid to supporting the full scale as an independent indicator of differentiation of self. The lack of psychometric evidence is significant because of the conclusions drawn with respect to the DSI full scale score. When building support for the accuracy and generalizability of research conclusions the structural validity of the scales used is essential. The lack of structural support for the full scale score is a limiting factor on research that utilizes the full scale score to support conclusions about how differentiation of self relates to other constructs. Due to the lack of explicit support for the full scale score the conclusions in this study concerning the DSI full scale score are no exception to this skepticism.

Summary. The limitations of Studies 1, 2, and 3 provide a structure that limits the generalizability of the evidence supporting the DSI-SF. Although researchers are encouraged to use the DSI-SF they should be most cautious when using the DSI-SF outside of its tested context (e.g. Caucasian college students). As stated above, the modest reliabilities of the

DSI-SF, though remarkably consistent with the DSI-R, introduce a significant amount of error into any research process that does not explicitly estimate the error of the constructs under scrutiny (i.e. regression analysis). It is recommended that the DSI-SF be used with analyses that explicitly measure the error values of the latent constructs (i.e. SEM analysis).

Application and Future Research

Despite the limitation discussed above the DSI-SF does have evidence supporting its consistency in measurement, efficiency (compared to the DSI-R), and veracity of conclusions drawn with respect to the relationship that the DSI-SF has to other constructs in a college aged sample. The DSI-SF provides researchers seeking to study Bowen's Family System Theory a tool that is more efficient than the DSI-R yet retains similar psychometric properties. In addition to research with Bowen's theory. the DSI-SF could be used by researchers who intend to study the differentiation process in college students in relationship to other constructs or variables. Due to the nature of the subscales, specific scales could be used from the DSI-SF to study sub-components of differentiation of self. For instance, the ER subscale could be used to study emotional sensitivity in relationships with others.

Future research with the DSI-SF includes a variety of areas. More work needs to be done to strengthen the subscales that exist currently in the DSI-SF. A more rigorous review of the structure of the DSI-SF could be accomplished using exploratory factor analyses techniques. In addition, more items could be created to replace the poorer performing items in the DSI-SF without hindering the efficiency of the scale. Evidence supporting the scale in other cultural contexts is also very important. Future studies should be targeted at

69

strengthening the support for the scale specifically in clients from non-majority cultural backgrounds.

Once the scale items have been strengthened the DSI-SF could be used in conjunction with other measures of relational development (e.g. attachment) to expand the field's understanding of relationship development. Another area of future research is in resiliency against anxiety and depression that may be related to a strong differentiation of self. Exploring the effects of decreasing the emotional reactivity of an individual, for instance, may lead to better coping skills and more resilience in the presence of relationship stress. Once the scale has been strengthened to an acceptable level, with internal consistency estimates above .90, the DSI-SF might be utilized in a clinical context to explore the impact of differentiation of self with clients. Exploring the clinical impact of differentiation of self could be important in developing therapies effective in improving resiliency against anxiety and depression.

Conclusion

The goal of this study was to create a more efficient version of the DSI-R in order to promote measurement, and research, of differentiation of self. The DSI-SF was created and analyzed in a sequence of three studies. Each study addressed a different portion of the scale development. In the first study the DSI-SF was created. In the second study the structure of the DSI-SF was analyzed and evidence supporting the reliability and validity of the scale was examined. Finally, in the third study, evidence of test-retest reliability was explored. Despite significant challenges, the DSI-SF was developed and evidence supporting the reliability, concurrent criterion, convergent validity was found.

I recommend the use of the DSI-SF in research with the caveat that caution should be used with respect to the moderate evidence of structural validity of the scale. As with all instruments, caution should also be used when applying the DSI-SF outside of areas specifically supported by the context of the validity and reliability evidence.

The work on the DSI-SF also promotes work on Bowen's Family System Theory specifically and relational development in general. I view relational development as the developmental process that governs how a person relates to significant others in their lives. Several theories attempt to capture a part of this construct (e.g. differentiation of self and attachment). The literature in the area of individuation and relational development supports the idea that the better an individual is at navigating relationships the more resilient they are against distress. In essence, promoting relational development also promotes resiliency and psychological well-being.

As a counseling psychologist I believe that the development of constructs that promote well-being are essential to the advancement of the field of psychology. By increasing well-being we promote the happiness of the individual and the reduction of psychopathology. Designing techniques that promote psychological health and well-being would be incredibly beneficial to clients, clinicians, and society. As well-being is increased, psychopathology is decreased, and life satisfaction improves everyone benefits. The DSI-SF is one step closer to this ideal.

These are questions concerning your thoughts and feelings about yourself and relationships with others. Please read each statement carefully and decide how much the statement is generally true of you on a 1 (not at all) to 6 (very) scale. If you believe that an item does not pertain to you (e.g., you are not currently married or in a committed relationship, or one or both of your parents are deceased), please answer the item according to your best guess about what your thoughts and feelings would be in that situation. Be sure to answer every item and try to be as honest and accurate as possible in your responses.

	Not at all characteristic of me.					Very characteristic of me.	
1. I tend to remain pretty calm even under stress.	1	2	3	4	5	6	IP1
2. I usually need a lot of encouragement from others when starting a big job or task.	1	2	3	4	5	6	FO1
3. No matter what happens in my life, I know that I'll never lose my sense of who I am.	1	2	3	4	5	6	IP2
4. I tend to distance myself when people get too close to me.	1	2	3	4	5	6	EC1
5. When my spouse/partner criticizes me, it bothers me for days.	1	2	3	4	5	6	FO2
6. At times my feelings get the best of me and I have trouble thinking clearly.	1	2	3	4	5	6	ER1
7. I'm often uncomfortable when people get too close to me.	8	2	3	4	5	6	EC2
8. I feel a need for approval from virtually everyone in my life.	1	2	3	4	5	6	FO3
9. At times, I feel as if I'm riding an emotional roller-coaster.	1	2	3	4	5	6	ER2
10. There's no point in getting upset about things I cannot change.	1	2	3	4	5	6	IP3
11. I'm overly sensitive to criticism.	1	2	3	4	5	6	ER3
12. I'm fairly self-accepting.	1	2	3	4	5	6	IP4
13. I often agree with others just to appease them.	1	2	3	4	5	6	FO4
14. If I have had an argument with my spouse/partner, I tend to think about it all day.	1	2	3	4	5	6	ER4
15. When one of my relationships becomes very intense, I feel the urge to run away from it.	1	2	3	4	5	6	EC3

16. If someone is upset with me, I can't seem to let it go easily.	1	2	3	4	5	6	ER5
17. I often feel unsure when others are not around to help me make a decision.	1	2	3	4	5	6	FO5
18. I'm very sensitive to being hurt by others.	1	2	3	4	5	6	ER6
19. My self-esteem really depends on how others think of me.	1	2	3	4	5	6	IP5
20. I tend to feel pretty stable under stress.	1	2	3	4	5	6	IP6

DSI-SF Scoring Key: As with the DSI-R (Skowron & Schmitt, 2003) several of the items in the DSI-SF are reverse scored (i.e. a 6 = 1, 5 = 2, 4 = 3, etc.). Reverse score the following items: EC1, EC2, EC3, ER1, ER2, ER3, ER4, ER5, ER6, FO1, FO2, FO3, FO4, FO5, FO6, and IP5. To calculate a subscale score take the average of all items within a subscale (i.e. the average of EC1+EC2+EC3).

Appendix B: Demographic Questionnaire

Age:_____

I consider myself to be:
_____ Male
_____ Female
_____ Transgender

Race/Ethnicity (Check all that apply)
_____ Black, African American
_____ Asian or Pacific Islander
_____ Caucasian, White
_____ Hispanic
_____ Other

May 4, 2010

J. Rico Drake, BS
UMKC - School of Education
SOE 215
Kansas City, MO 64110

Approval Date: April 30, 2010

RE: SSIRB Protocol # : 100415: Differentiation of Self-Inventory - Short Form: Creation and initial evidence of construct validity.

Dear J. Rico Drake:

This is to inform you that your project proposal listed above was reviewed through the Social Sciences Institutional Review Board's expedited review process and has received approval under Category 7 of the categories of research that may receive expedited review.

Your request for a waiver/alteration of informed consent has been approved.

The study is next subject to continuing review on or before 4/29/2011, unless closed before that date.

You may therefore proceed with your study. Notwithstanding the SSIRB's approval to conduct the study, in the following situations you must provide timely additional information in order to maintain the SSIRB's approval.

1. The SSIRB cannot approve studies for more than one year. Unless the SSIRB renews its approval, your authority to conduct this study will expire on 4/29/2011. To request a continuation of your authority to conduct the study you will need to submit a completed Research Progress Report to the SSIRB office. Your authority to conduct the study cannot be continued until your completed Research Progress Report has received the necessary SSIRB review and approval. Therefore, you need to submit the completed Research Progress Report at least one month prior to the anniversary date of your project's approval/reapproval. The date of this letter is

the approval date for your study. However, if your study requires more than one extension, the applicable anniversary date may change from year-to-year. Consult your most recent approval/reapproval letter for the applicable anniversary date. Call the SSIRB office if you have questions about this.

2. If you want to make a change to the study, you must obtain the SSIRB's prior approval of the change.

3. If you want to add or delete investigators from the study, you must obtain the SSIRB's prior approval of the addition or deletion.

4. If a participant in your study is injured in connection with their participation, you must inform the SSIRB regarding this adverse event in a timely way.

Please inform the SSIRB when you complete the study.

If we can be of further assistance, please don't hesitate to call the SSIRB office at 816-235-1764. Best wishes for a successful study.

PLEASE NOTE:
If you are using a signed consent form a stamped and approved by the SSIRB version will follow via a separate email. You must receive the stamped version before you begin consenting subjects. All subjects must be consented on a copy of the approved consent form with the SSIRB Stamp. If requested, a hard copy of the stamped consent can be mailed to you.

Thanks,

Ms. Germaine Hughes
Administrator
Social Sciences Institutional Review Board
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This e-mail is an official notification intended only for the use of the recipient(s). This letter indicates the status of the UMKC Social Sciences IRB review of the referenced research project. When appropriate, a member of the UMKC Social Sciences IRB staff will be contacting the recipient(s) informing them of other IRB documents related to this project that are available to either 1) be picked up at the IRB office - 5319 Rockhill Road or 2) be mailed via campus mail or postal service - i.e.; revisions to consent form, advertisements, etc. If a signed copy of this letter is needed, please contact a member of the IRB staff. If you have received this communication in error, please return it to the sender immediately and delete any copy of it from your computer system.

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VITA

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Joseph is passionate about clinical work and has worked as a therapist for college counseling centers and community mental health centers in Kansas City. His other passion is teaching. He has taught a variety of subjects to counseling students. His favorite course to teach was research methods.

During the final three years of his graduate studies Joseph was awarded the Preparing Future Faculty Fellowship. As a PFF Fellow he refined his teaching skills and advanced his career goal of becoming a faculty member in higher education. He recently accepted a position as an assistant professor at Central Michigan University in the Counselor Education program. He hopes to bring UMKC's ambition for excellence to the CMU community.