Can Defense Mechanisms aid in the Differentiation of Depression and Anxiety

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Abstract

The aim of the current studies was to first determine the convergent validity of several observer and self-report measures of defense mechanisms, and second to determine whether participants in the depressed and anxious groups could successfully be differentiated using observer and self-report measures of defenses. In Study 1, defensive functioning of 150 university students was assessed using the Defense-Q, Defense Mechanism Rating Scale, Defense Style Questionnaire, and the Defense Mechanisms Inventory. The results of the Pearson *r* analyses indicated that the defense measures were correlated in a theoretically consistent manner at the overall and defense level analyses, with the strongest relations at the mature and immature ends of the scales. Four of the 17 individual defenses were correlated in a theoretically consistent manner. In Study 2, 1182 university students completed the Personality Assessment Inventory and those scoring in the clinical range on depression or anxiety indices were selected for participation in this study. The extent to which these participants could be correctly classified into their respective groups using defense scores from the Defense-Q and the Defense Style Questionnaire was assessed using discriminant analyses. Results indicated that defense scores from both observer and self-report measures can be used to classify participants correctly into depressed and anxious groups. The Defense-Q discriminant function primarily identified depression-related defenses as important for differentiation, whereas the Defense Style Questionnaire discriminant function primarily identified anxiety-related disorders. Confirmatory stepwise discriminant analyses confirmed that the defenses previously identified in the literature were among the most effective in differentiating between the groups. The results from the present investigation identify substantial differences between the defenses assessed by observer and self-report measures and indicate that both methods can be informative for differentiating between depressed and anxious participants.

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ADP	Adaptive Defense Profile
ANX	Anxiety
ARD	Anxiety Related Disorders
BSI	Brief Symptom Inventory
CES-D	Centre for Epidemiological Studies – Depression
DEP	Depression
DMI	Defense Mechanisms Inventory
DMRS	Defense Mechanism Rating Scale
DSM-IV	Diagnostic and Statistical Manual for Mental Disorders, 4th Edition
DSM-IV-TR	Diagnostic and Statistical Manual for Mental Disorders, 4th Edition Text Revision
DSQ	Defense Styles Questionnaire
ESI	Expanded Structured Interview
GAD	Generalized Anxiety Disorder
GSI	Global Severity Index
INC	Inconsistency
INF	Infrequency
MDD	Major Depressive Disorder
MMPI	Minnesota Multiphasic Personality Inventory
OCD	Obsessive Compulsive Disorder
ODF	Overall Defensive Functioning Scale
PAI	Personality Assessment Inventory
PRN	Principalization
PRO	Projection
PTSD	Post-traumatic Stress Disorder
REV	Reversal
RDF	Rogers Discriminant Function
SCL-90	Symptom Check List – 90
SCL-90-R	Symptom Check List – 90 – Revised
STAI	State Trait Anxiety Inventory
TAO	Turning Against the Object
TAS	Turning Against Self
TAT	Thematic Apperception Test

Can Defense Mechanisms aid in the Differentiation of Depression and Anxiety

Defense mechanisms[1] are "the cornerstone on which the whole structure of psychoanalysis rests" (Freud, 1914/2001, p. 16). As such, defenses have long been central to understanding personality and psychopathology from a psychoanalytic[2] perspective (Cooper, Perry, & O'Connell, 1991) and they have become one of the most important contributions of psychoanalytic theory to the understanding of personality and psychopathology (Offer, Lavie, Gothelf, & Apter, 2000). There has been a recent resurgence of interest in defense mechanisms. The *Diagnostic and Statistical Manual for Mental Disorders, Fourth Edition, Text Revision (DSM-IV-TR*; American Psychiatric Association, 2000*)* has acknowledged the utility of defense mechanisms for the diagnosis and treatment of mental disorders by including the Defensive Functioning Scale as an "axis for further study." Also, Vaillant (2000) has been investigating the prospective relation between defenses and health in a number of longitudinal studies. Researchers have even proposed defenses as a possible metric by which to judge all mental health, in much the same way that IQ tests have been used as a metric to judge intelligence (Vaillant, 2000). In order for defenses to serve this important function, however, defense mechanisms assessment tools must demonstrate clinical utility in a number of domains. In two studies I will examine the convergent validity of several observer and self-report measures of defense mechanisms and then examine the utility of defenses in terms of differentiating between two overlapping types of symptomatology: depression and anxiety. First, I will review the psychodynamic theory related to defenses, depression, and anxiety. Next, I will broadly discuss defense research, including methods to assess defenses and how they relate to psychopathology. I will then focus on defense research as it relates to two specific types of disorders, depressive disorders and anxiety related disorders. And finally, I will describe the studies.

THEORY

Theory of Defense Mechanisms

More than a century ago Sigmund Freud introduced the concept of defense mechanisms (Freud, 1894/2001). This revolutionary idea provided insights into puzzling psychiatric symptoms and later into everyday nonpathological behaviours (Cramer, 1998a). Freud explained psychiatric symptomatology as a compromise in the conflict among the id, ego, and superego.

[1] The terms "defense mechanisms" and "defenses" will be used interchangeably throughout this paper.

This compromise was mediated by the defense mechanisms. This explanation added greatly to the understanding and diagnosis of illnesses from Freud's time continuing to the present (Hentschel, Kiessling, Teubner-Berg, & Dreier, 2004).

Freud originally conceived of defenses as "intrapsychic" mechanisms that mediate the internal struggles between the internalized societal expectations of the superego and the instinctual drives of the id (Brenner, 1991). Ego "mechanisms of defense" form compromise formations (Busch, Milrod, & Singer, 1999), which function to satisfy the drives of the id maximally under the constraints of the superego (Brenner, 1991). If the anxiety is completely mitigated by defenses, then the compromise formation will not result in pathology (Brenner, 1991). If, however, the anxiety is not completely resolved by defenses, then it remains a part of the compromise formation and results in some level of pathology (Brenner, 1991). According to the theory, the presence or absence of psychopathology is directly related to the effectiveness of defenses in resolving anxiety.

Freud argued that the ego is a psychic apparatus that organizes various functions such as cognition, memory, learning, mood regulation, anxiety, and defense mechanisms (Busch et al., 1999; Freud 1926/2001; Shill, 2004). "Signal anxiety", he argued, is unconscious anxiety, "in miniature," that results from an assessment by the ego that psychologically meaningful danger is detected (Shill, 2004). Often this danger is the result of a conflict between internal wishes or drives of the id and either external reality or internalized prohibitions from the superego (Perry, 1990). The assessment of danger and subsequent signal anxiety leads to a mobilization of the ego defense mechanisms (Busch et al., 1991; Shill, 2004). These ego defense mechanisms, mobilized after the miniature unconscious anxiety, then work to prevent or minimize the resulting "traumatic anxiety" (e.g., a panic attack; Busch et al., 1999; Shill, 2004). If they are effective at sufficiently reducing anxiety, then pathology is avoided.

Throughout his writings, Freud outlined the role defenses play in several areas, including reality testing, judgement, cognition, ego functioning, psychopathology, and adaptation to conflict (Cooper, 1998). While his early writings used terms such as "mechanisms of defense" and "Repression" synonymously, Freud's later writings outlined other individual defenses such as Denial, Displacement, Dissociation, Fantasy, Hypochondriasis, Isolation, Projection, Reaction

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[2] Despite some differences in meaning, the terms "psychoanalytic" and "psychodynamic" will be used interchangeably throughout this paper.

Formation, Regression, Splitting, Sublimation, Turning Against the Self, and Undoing (Baumeister, Dale, & Sommer, 1998; Bond, Gardner, Christian, & Sigal, 1983; Cooper, 1998; Vaillant, 1992; White, 1948). Despite using these terms throughout his writing, Freud never compiled a comprehensive list or developed a fully integrated theory of defense mechanisms (Baumeister et al., 1998; Perry, 1996; Perry & Ianni, 1998). After his death others, including his daughter Anna, continued Freud's work on defense mechanisms.

One of the most significant theoretical contributions to defense mechanisms comes from object relations theory, which moved defenses out of the exclusivity of the intrapsychic realm (Cooper, 1998). Object relations theory posited that, in addition to managing the intensity of needs, desires, and affects stemming from basic drives, defenses also functioned in the cognitive and relational domains to protect self-esteem in interpersonal relationships (Cooper, 1998). The function of defenses was therefore expanded to include not only protecting persons from awareness of unacceptable thoughts and wishes, but also to protect them from actual or psychic loss of relationships (Battlegay, 1991; Brody, Muderrisoglu, & Nakash-Eisikovits, 2002).

Contemporary theorists and researchers now commonly conceptualize defenses as managing anxiety from both internal and external threats (Cooper, 1998). Defense theory has been expanded to acknowledge defenses' role in protecting individuals from unconscious thoughts that might produce overwhelming anxiety if they became conscious as well as their role in managing relationships with others, managing external stressors, promoting overall good psychological adaptation, and maintaining well-being, self-esteem, or self-concept (Baumeister et al., 1998; Brody et al., 2002; Conte & Apter, 1995; Cooper, 1998; Cramer, 1998a; DeFife & Hilsenroth, 2005). Noting this change in the overarching theory of defenses, Cooper (1998) writes that since the late 1970s "contemporary psychoanalytic theory has shifted to thinking about needs, affect, and wishes much more prominently in the interpersonal context" (p. 954). Looking more specifically at defense mechanisms, Cramer (1998a) goes further, writing that "to continue to think of defense mechanisms as [only] linked to pathology and instinctual drives is only possible if one ignores all that has been written in psychoanalytic theory since 1930" (p. 885).

Although many aspects of defense mechanisms are commonly agreed upon by researchers and theorists, some aspects have resulted in considerably less agreement in the literature. For example, the number of defenses and what should and should not be considered a

defense mechanism remains somewhat controversial (Conte & Apter, 1995; Cramer, 1998b; Muris & Merckelbach, 1994; Paulhus, Fridhandler, & Hayes, 1997; Skodol & Perry, 1993). More than 40 different defense mechanisms have been identified by various researchers (Cramer, 1998b). Moreover, given the abstract nature of defense mechanisms, even similar or identically named defense mechanisms sometimes differ considerably on their definitions and conceptualizations (Conte & Apter, 1995). See Table 1 for a comparison of definitions of individual defenses from the observer report measures discussed below. Valliant and Drake (1985) also discuss the abstract nature of defenses, noting that despite being potentially useful for making diagnoses, precisely identifying defense mechanisms can be difficult. They write, "defenses are, after all, metaphors; they are a shorthand way of describing different cognitive styles and modes of rearranging inner and outer realities" (p. 601).

In sum, defenses were originally conceptualized as mechanisms that were initiated by signal anxiety and functioned to mediate conflict between the overly harsh superego and the unbridled instincts of the id. Freud's early work provided insights into psychiatric symptomatology and later revisions of his work helped to explain normal personality. Modern theorists have expanded Freud's work to include defenses as functioning to manage both internal and external threats. Finally, Freud's original conception of a single defense mechanism, later expanded to a few defenses, has now blossomed into a large number of identified mechanisms of defense. The abstract nature of defenses in combination with the expanding number of identified defenses has led to some disagreement on the conceptualization of some defenses.

Definitional Criteria of Defense Mechanisms

Despite the shift in focus from an exclusively intrapsychic understanding to a more interpersonal understanding, Freud's (1894/2001) initial conceptualization of defenses has remained quite stable. Throughout his writing, Freud laid out what he considered to be the five most important criteria for defining defenses (Vaillant, 1992). The first criterion is that defenses manage instincts and affects and that they are the most effective method that the ego has available to do this. Second, defenses are unconscious at the time of use. The third criterion is that there exist many different defenses and these defenses can all be distinguished from each

other. Fourth, although defenses are often the hallmark of major psychiatric symptoms, they are dynamic and reversible. Finally, all defenses can be adaptive[3] as well as pathological.

More recent conceptualizations of defenses are somewhat expanded but retain the essential elements from Freud's original conceptualization (Perry, 1990). For example, current researchers (Conte & Apter, 1995; Cramer 1998b; Davidson & MacGregor, 1998) identified six definitional criteria for defenses. The first and foremost criterion is that defense mechanisms are unconscious. Accordingly, the actual defensive behaviour may be conscious (e.g., persons may be aware that they "fidget" when they are feeling anxious) but the behaviour is not consciously intended to relieve the anxiety. While some researchers occasionally add a small element of conscious effort into definitions of defense mechanisms, there is a general consensus that conscious effort is more indicative of a coping strategy and not of a defense mechanism (Cramer, 1998b). As Cramer (1998b) puts it, defense mechanisms' "occurrence is not willed; rational decision making is not involved" (p. 925).

The second definitional criterion of defense mechanisms is that they operate to manage psychic threat and protect self-esteem and integration of the self. For example, in the fidgeting example above, the person might be unaware that the fidgeting is a behavioural manifestation of defense mechanism Undoing, which is operating to protect against awareness of a desire to engage in unacceptable sexual behaviours (Davidson & MacGregor, 1998). This criterion allows for threat to be both entirely intrapsychic, as Freud originally proposed, as well as external. For example, the psychic threat could be the loss of a spouse and the defensive response might be to write beautiful poetry about life via the defense mechanism Sublimation.

Third, defense mechanisms work to help manage affect or protect persons from high levels of anxiety. An initial threat will cause negative affect or "signal anxiety" and then this signal anxiety will trigger the use of defense mechanisms to prevent more severe anxiety or "traumatic anxiety" (Busch et al., 1999). In this way defenses are mobilized in an effort to manage and prevent more severe levels of anxiety. For example, in an anxiety provoking situation signal anxiety might trigger the use of the defense mechanism Humour in order to relieve some of the uncomfortable anxiety by emphasizing an ironic aspect of the situation. This defense use effectively addresses the anxiety, thereby preventing resulting traumatic anxiety.

[3] Following the suggestion of other researchers (e.g., Bond, 2004; Kwon, 2000) I will use the terms "adaptive" and "mature" interchangeably as well as "maladaptive" and "immature" interchangeably.

The fourth definitional criterion of defenses is that they are part of normal personality and are relatively stable ways of dealing with anxiety. Throughout the lifespan people use defenses of varying levels of adaptiveness depending on their psychological maturity as well as the circumstances surrounding the situation (Cramer, 1991). Reliance on specific defenses may change slowly over time, but defenses are typically stable and change at a rate similar to other personality dimensions (Chaplin, John, & Goldberg, 1988; Cramer, 1991). According to this criterion then, persons will usually employ the same constellation of defenses over a broad range of circumstances. For example, a person might use Intellectualization to explain how his divorce is the result of a worldwide degradation of the sanctity of marriage and also how an overly competitive capitalistic society has forced him into being underemployed and underappreciated. Although typically considered stable, during periods of acute stress individuals may regress and temporarily rely on more immature defense mechanisms than are typically utilized (Cramer, 1998b; Holi, Sammallahti, & Aalberg, 1999; Kipper et al., 2005; White, 1948).

Fifth, excessive or rigid use of one or very few defense mechanisms may lead to psychopathology. This criterion helps to illustrate that defense use itself is not inherently maladaptive, but that rigid use of a small group of defenses or excessive use of developmentally inappropriate defenses contributes to psychopathology. Psychodynamic theorists argue that all people use a wide variety of defenses (Bond, 2004). Rigid reliance on even the most adaptive of defense, such as Humour, can become maladaptive. For example, although typically adaptive, unrelenting jokes via the use of the defense Humour may not be the most effective way to manage anxiety during the funeral of a spouse. Flexible use of a wide variety of defenses is essential in effectively reducing anxiety to prevent the development of psychopathology. Emphasizing the point that defenses are no longer considered inherently maladaptive, Cramer (1998a; 1998b) notes that since the 1930s it has been accepted that defense mechanisms are also a part of normal adaptive functioning.

Finally, defenses are distinguishable. Each defense mechanism has criteria upon which it can be differentiated from other defenses (Davidson & MacGregor, 1998). This criterion is crucial to the understanding of defense theory and how different psychopathologies are related to different patterns of defense use. While the precise definition and function of individual defenses sometimes lacks consensus (Andrews, Singh, & Bond, 1993; Bond 2004; Conte & Apter, 1995; Cramer, 1998b; Muris & Merckelbach, 1994), there is a wide acceptance that individual defense

mechanisms with differing functions do exist and can be assessed and differentiated (Paulhus et al., 1997). As can be seen, there is a great degree of similarity between Freud's original conceptualization and the current conceptualization of defenses.

Finally, a current definition of the term "defense mechanism," and the one used by all authors in the *Journal of Personality* special issue on defense mechanisms (Cramer & Davidson, 1998), is:

> "defense mechanism" refers to a mental operation that occurs outside of awareness. The function of the defense mechanism is to protect the individual from experiencing excessive anxiety. According to older, classical psychoanalytic theory, such anxiety would occur if the individual became aware of unacceptable thoughts, impulses, or wishes. In contemporary thinking about defenses, an additional function is seen to be the protection of the self – of self-esteem and, in more extreme cases, protection of the integration of the self. (Cramer, 1998a, p. 885)

In summary, definitional criteria of defenses have remained relatively stable over the past century. Defenses are an unconscious and stable part of normal personality that functions to manage anxiety. There are many different defenses, each with its own function and circumstances where it would be considered adaptive. Recent conceptualizations include protection from internal as well as external threats and recognize defenses' function in maintaining self-esteem and integration of the self.

Maturity/Adaptiveness of Defense Mechanisms

Terminology

Although the terms "maturity" and "adaptiveness" of defenses are most often used interchangeably in the current literature, the two terms originated in slightly different contexts. Maturity stems from the idea that defense mechanisms are often conceptualized on a developmental continuum. Defenses that appear earlier in life are necessarily less complex, and therefore less mature (Paulhus et al., 1997). For example, Denial appears early in life as it is not very cognitively complex (i.e., the unconscious equivalent of simply not believing something; Cramer, 1991). Defenses such as Projection require the cognitive complexity to differentiate one's own mind from the mind of others (Paulhus et al., 1997), which is an impossible task for very young children. Once persons begin to differentiate their own mind from the mind of others

and they can recognize that others can be deceitful, their own self-deceitfulness (i.e., Denial) becomes less effective. As such, reliance on less mature defenses begins to decline and other defenses such as Projection begin to dominate (Paulhus et al., 1997; White, 1948). Finally, even more complex defenses such as Intellectualization and Identification begin to appear later yet, often in adolescence (Paulhus et al., 1997). While development typically follows a predictable path, situations like acute emergencies may result in a regression of the maturity of defenses and temporary reliance on Denial or other less mature defenses may reoccur (White, 1948).

The term adaptiveness stems from the idea that some defenses are typically more effective at reducing anxiety in "acceptable" ways. Defenses were grouped in terms of their acceptability, which refers to both how effectively anxiety might be reduced and what consequences might result from the defensive action (Bond et al., 1983). Those that are effective at reducing anxiety and had positive consequences were considered adaptive, whereas those that were either ineffective at reducing anxiety or led to negative consequences or reactions from others were considered maladaptive (Bond et al., 1983). Because adaptive defense are generally the more cognitively complex, theories of maturity and adaptiveness coincided to a large degree and the words are mostly used interchangeably.

Hierarchy of Adaptiveness/Maturity

In his writings, Sigmund Freud indicated that defense mechanisms differed in their ability to manage anxiety effectively (1917/2001). As such, he laid the foundations for modern ideas of a hierarchy of adaptiveness (i.e., healthiness) of defense mechanisms. Vaillant (1976) provided some of the first empirical evidence that supported Freud's idea that defense mechanisms could be arranged on a hierarchy and that this could predict outcomes like success in life. Work by Vaillant and colleagues (Vaillant, Bond, & Vaillant, 1986), Perry and Cooper (1989) and Bond and colleagues (1983) among others empirically established the concept of a hierarchy of defense (Paulhus et al., 1997; Skodol & Perry, 1993). Despite the agreement that defense can be ordered in a hierarchy of adaptiveness, there remains some disagreement with regard to the ordering of the defenses within the hierarchy (See Table 2 for examples of the hierarchy in defense measures), and even with regard to the names, definitions, and conceptualizations of defenses to be included (Andrews, Singh, & Bond, 1993; Bond 2004; Conte & Apter, 1995; Cramer, 1998b; Muris & Merckelbach, 1994).

In general, defenses can be classified into those that are relatively effective at managing anxiety (e.g., mature/adaptive), those that are somewhat effective but also somewhat problematic (e.g., neurotic), and those that are ineffective or cause additional difficulties for the individual (e.g., immature/maladaptive; Andrews, 1991; Andrews, Pollock, & Stewart, 1989). Mature defenses emerge later in life and they result in the fullest acknowledgement of the nature and extent of the threat and they directly work to limit the anxiety resulting from the threat until it can be dealt with (Andrews, 1991; Andrews et al., 1989; Kwon, 2000; Punamaki, Kanninen, Qouta, & El-Sarraj, 2002). This limiting of anxiety is often achieved by adding or transforming something minor rather than relying on heavy distortion (Hentschel et al., 2004). Because mature defenses involve acknowledging reality as something that can be influenced, they often lead to constructive action (Brody et al., 2002; Kwon, 2000; Punamaki et al., 2002).

Neurotic defenses also result in acknowledgement of the occurrence of the threat but are used to manage anxiety by more heavily distorting the meaning (e.g., inverting it) and therefore the impact of the threat to oneself (Andrews, 1991; Andrews et al., 1989). The use of these defenses is typically somewhat effective at reducing anxiety, but comes with more negative consequences or less effective resolution than the use of more mature defenses (Vaillant, 1992). Neurotic defenses, by definition, represent psychological ambivalence (Oakley, Song, & McQuirter, 2005).

Immature defenses emerge early in life and reduce anxiety by heavily distorting the occurrence of the event (e.g., denying or transferring responsibility for it) as well as its salience (Andrews, 1991; Andrews et al., 1989; Punamaki et al., 2002). Immature defenses lead to such extensive distortion of objective perception that a feeling may never reach consciousness (Brody et al., 2002; Hentschel et al., 2004; Kwon, 2000; Kwon & Lemon, 2000). As a result of the heavy distortion and lack of conscious awareness, immature defenses often lead to inaction or inappropriate action (Brody et al., 2002; Kwon, 2000; Kwon & Lemon, 2000).

Although there is a generally accepted level of adaptiveness of defense mechanisms, as noted in the definitional criteria above, any defense mechanisms can be effective or ineffective in particular circumstances. For example, while typically considered a maladaptive defense, Denial can be useful in getting a soldier to function well in life-threatening situations (Punamaki et al., 2002) and Splitting can be useful to conceptualize combat enemies as “all bad” (Shale, Shale, & Shale, 2003). Similarly, while Humour is typically considered an adaptive defense, rigid use of

Humour in an extreme situation such as when one is being victimized in a physical or sexual assault may not be as adaptive or effective at managing anxiety as a more immature defense such as Dissociation. It has been noted that regardless of typical patterns of use, in extreme situations individuals may utilize any and all defense mechanisms in an effort to manage the extreme anxiety (Cramer, 1998b; Holi et al., 1999; Kipper et al., 2005). In general, however, defense use is relatively stable with a reliance on a set constellation of defenses.

While the terms maturity and adaptiveness of defenses originally came from somewhat different theoretical work, they have come to be used interchangeably in the defense literature. Over the past decades several researchers have empirically validated hierarchies based on maturity/adaptiveness of defenses. There is now a general consensus that defenses can be divided into categories such as mature, neurotic, and immature. Given the varying definitions of some defenses, however, debate remains as to where some defenses fall on the hierarchy.

Psychodynamic Theories of Psychopathology

Sigmund Freud (1926/2001) argued that there is an intimate link between certain defenses and specific forms of psychopathology. According to his daughter, Anna Freud (1995), everyone uses a characteristic pattern of defenses. Defense mechanisms, she argued, are used by the ego to "put the instincts [of the id] permanently out of action" (p. 7). Commenting on how defenses relate to psychopathological symptomatology, Anna (1995) wrote that "there is a regular connection between particular neuroses[4] and special modes of defense, as, for instance, … between obsessional neurosis and the process of isolation and undoing" (p. 34). She argued that defenses function to maintain a balance and prevent excessive levels of anxiety stemming from intra– or interpersonal conflicts from entering into consciousness. Although Anna Freud never wrote that defenses would show a one-to-one relation with specific disorders, she did indicate that clusters of defenses would show some predictable relation to diagnostic categories (Hentschel et al., 2004).

Many current researchers echo the idea that the presence and severity of certain psychopathologies is related to the frequency of use and level of adaptiveness of defense mechanisms (e.g., Andrews, Page, & Neilson, 1993; Hentschel et al., 2004; Offer et al., 2000). Commenting on the relation between defense use and psychopathology, Laplanche and Pontalis

[4] Neuroses is a general term that encompasses various symptomatology that today would be referred to as panic attacks, phobias, obsessions and compulsions, amnesias etc. (White & Watt, 1973a).

(1983) noted that, according to psychodynamic theory, "which [defense] mechanisms predominate in a given case depends upon the type of illness under consideration [and] upon the developmental stage reached" (p. 109). Andrews, Page, and Neilson (1993) further note that the relation between defenses and psychopathology has become so accepted that the intellectual culture of psychiatry in the modern age seemingly assumes that personality vulnerability such as immature defense use somehow contributes to neuroses. Further commenting on the relation between defenses and psychopathology, Andrews, Page, and Nielson go on to argue that "it is not difficult to become disabled by symptoms of anxiety or depression if one … preferentially uses nonmature defense styles in the face of adversity" (p. 585). Perry (1990) argues that "Although defenses may not be the principal cause of symptoms per se, it is assumed that the adequacy or adaptiveness of defense responses may trigger the onset or affect the course of symptoms" (p. 545).

In addition to the relation of some individual defenses to certain pathologies, some theorists (e.g., Gothelf et al., 1995; Kennedy, Schwab, & Hyde, 2001; Offer et al., 2000) note that empirical research indicates that many psychiatric disorders have similar patterns of defense use and that disorders might all "share a common psychopathogenesis characterized by ego deficits or faulty ego development, causing a lack of maturation in defense mechanisms" (Offer et al., 2000, p. 39). Gothelf and colleagues argue that evidence supports the notion that all psychiatric patients share an overuse of immature defense in comparison to "normal controls."

Since the work of Sigmund and Anna Freud, a relation between defense use and psychopathology has been proposed. Theorists and researchers have produced sufficiently convincing work that modern psychiatry seemingly automatically assumes a relation between defenses and psychopathology. While not necessarily a one-to-one relation, specific defenses are thought to be linked to specific psychopathologies. In addition to the individual defense and individual form of psychopathology, there is some evidence that psychopathology in general may have some common defensive underpinnings.

Psychodynamic Theories of Depression[5]

In 1917 Sigmund Freud (1917/2001) described how melancholic persons turn aggression felt for an ambivalently viewed loved one inwards toward the self. Freud noted that depression was the result of real or perceived loss and that persons often turned aggression toward the self or used Identification with the Aggressor to become more like the object[6] to mitigate the loss (Freud, 1917/2001). Since Freud's seminal article in the area, psychodynamic theorists and researchers concerned with depression have focused mostly on depression as a reaction to loss or on the relation between depression and defense mechanisms (Pinkus, Boncori, & Chimenti, 1980; White & Watt, 1973b). As a result of this work, a considerable amount of evidence has shown that self-critical defenses are trait vulnerabilities for depression (Besser, 2004). Depending on the description of defense functions and definitions used these self-critical defenses could include several defenses such as Turning Against the Self, Passive Aggression, and Devaluation of the Self.

One example of the application of psychodynamic theory to depression is given by DeFife and Hilsenroth (2005). Like Freud, they argue that those with depression mediate conflicts resulting from real or imagined loss in a variety of ways. These methods include turning anger away from others and towards the self by punishing the self for feelings of hopelessness, helplessness, or rejection (e.g., Turning Against Self, Passive Aggression), by seeking help then covertly rejecting it (e.g., Help-rejecting Complaining/Hypochondriasis), or by immediately acting on wishes or feelings without considering the consequences (e.g., Acting Out). DeFife and Hilsenroth argue that continued use of these defenses serves to provoke negative reactions from those around the individual and creates a downward spiral of negative events that causes and then maintains the individual's feelings of worthlessness, helplessness, and hopelessness (DeFife & Hilsenroth, 2005).

In addition to increased use of Turning Against the Self, Passive Aggression, Help-rejecting Complaining and Acting Out, DeFife and Hilsenroth (2005) also discuss a deficit in the use of other defenses. Specifically, a reduced reliance on defenses that work to keep threatening thoughts and ideas out of consciousness (e.g., neurotic defenses such as Undoing, & Intellectualization) results in more severe and apparent symptomatology as persons with

[5] The term "depression" will be used to refer to depressive disorders in general. When applicable, specific diagnoses such as Dysthymic Disorder and Major Depressive Disorder will be used.

depression are unable to keep the threats out of conscious awareness (DeFife & Hilsenroth, 2005). In contrast, those with strong neurotic defenses might completely keep threatening thoughts out of awareness, although conflict might leak through "out of the blue" as is seen in those with panic attacks (Busch et al., 1999; DeFife & Hilsenroth, 2005).

White and Watt (1973b) describe a theory of depression that is also based on actual or perceived loss. Examples of loss range from the death of a spouse, the loss of moral support of a congenial group, down to the perception of a cooling of interest from close others (White & Watt, 1973b). This feeling of loss is complicated by feelings of anger and hostility toward the deserting person. Any feelings of anger toward the other is sensed as a weakness in one's own self-reliance, and instead of being directed at the other, those feelings of anger and hostility are perceived as being directed toward oneself. There may also be a "stubborn refusal to cheer up" or a quick rejection of helpful suggestions by others, which may indicate the presence of Passive Aggression or Help-rejecting Complaining (White & Watt, 1973b).

Like Freud (1917/2001), DeFife and Hilsenroth (2005), and White and Watt (1973b), Milrod (1988) also writes that sadness is the ego's response to actual or perceived loss. Milrod agreed with Freud (1917/2001) that sadness, grief, or mourning were all the normal analogs to pathological depression. Depression then, is when the experiences of loss triggers rage or hostile responses that are turned inward toward the self. Self-directed aggression is the essential element of depression and it is that aggression that differentiates it from nonpathological sadness (Milrod, 1988). Milrod notes that depression is preserved in part by Denial of all evidence of worthiness and self-value (Milrod, 1988). Instead, exaggerated self-blame predominates. The severity of the depression, Milrod argues, is partially dependent on the severity of the Denial. He further notes that the most important variable in determining the clinical picture and prognosis for the individual is the degree of maturity of their ego, specifically the ego's ability to neutralize the anxiety through defenses (Milrod, 1988).

Building on the work of many of the theorists above, Rudden and Colleagues (2003) note that most psychoanalytic theories of depression describe a narcissistic vulnerability stemming from early loss or experiences with parents that are perceived to be unempathic, frustrating, or rejecting. Whether this description accurately portrays the history of these individuals with depression or whether it is a by-product of their depressed view of the world is debatable, but

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[6] The term "object" is a general term used to refer to self, other, objects, and situations.

importantly it is a part of the individuals' experience of themselves and others (Rudden et al., 2003). This experience may lead to difficulty with self-esteem regulation and then acute episodes of depression exacerbate perceptions of themselves as unlovable, damaged, and inadequate (Rudden et al., 2003). Important others, often a parent, are blamed for the sense of injury. Envy or rage for those seen as more fortunate may also be present. Hostility towards others is typically turned inward toward the self, although it is sometimes projected outwards towards others (Rudden et al., 2003; White & Watt, 1973b). Guilt over the hostile, envious, or vengeful feelings is common.

Rudden and colleagues (2003) acknowledge that neurobiological theories of depression are important for completely understanding depression and that neurobiology sets the stage for the psychodynamics. Like Milrod (1988), they further note that although there are numerous hypothesized and documented triggers to depression, "resulting hostility directed toward the self is crucial to the depressive experience" (p. 1000). They conclude that although many disorders might involve reflected hostility, the distinguishing feature for depression is the difficulties with self-esteem regulation coupled with aggression turned inward (Rudden et al., 2003).

A similar theory of depression, utilizing Defense Mechanism Rating Scale (DMRS) defenses (see Table 2), is proposed by Hoglend and Perry (1998). They argue that Action Level defenses are used by those with conflicts over basic issues of dependency, attachment, and autonomy. Painful affect from events such as real or imagined loss limit the persons' defensive repertoire and they rely heavily on these immature defenses. Frustration is turned away from others and onto oneself (Passive Aggression), help is sought from others in a way that covertly punishes them for the persons' painful affect (Help-rejecting Complaining), and painful feelings are acted on immediately, without thought of consequences (Acting Out). These maladaptive defense mechanisms provoke negative reactions from close others, which begins a cascade of negative effects and a worsening of one's self-experience (Hoglend & Perry, 1998).

As a result of negative reactions from others, Major Image Distorting Level defenses (i.e., Splitting of Self, Splitting of Others, & Projective Identification) are mobilized to prevent severe psychological harm (Hoglend & Perry, 1998). Much like the primitive Action Level defenses, these Major Image Distorting defenses provide some survival value in the short-term, but lead to spiralling negative reactions from others, ensuring continued use of the available but maladaptive defenses of the depressed individual. The negative reactions from others may trigger use of

Devaluation of the Self in an effort to manage negative reactions. If this Devaluation is disavowed, Projection may be utilized to keep painful feelings about the self at a distance (Hoglend & Perry, 1998). While Devaluation of the Self and Projection temporarily relieve distress, they leave underlying conflicts ignored and unresolved. In contrast, use of a mature defense such as Self-observation allows one to recognize one's own maladaptive patterns and the effect they have on others. This allows persons to change their behaviour and address the underlying issue (Hoglend & Perry, 1998). In short, reliance on immature level defenses (e.g., Action Level, Major Image Distorting level) as opposed to neurotic or mature level defenses serves to aid the development and maintenance of depressive symptomatology.

In summary, the primary conflict common among all the theories of depression is actual or perceived loss. Rather than express the negative affect towards the person they feel has abandoned them, the aggression is turned inward on the self. The various theories of depression indicate elevated usage of primarily immature defenses such as Acting Out, Denial, Devaluation of the Self, Help-Rejecting Complaining, Identification with the Aggressor, Passive Aggression, Projection, Projective Identification, Splitting of Self, Splitting of Others, and Turning Against the Self, and reduced usage of neurotic or mature defenses such as Intellectualization, Self-observation, and Undoing. More generally, those with depression will demonstrate elevated use of immature defense and reduced use of mature defenses. These immature defenses serve to provoke negative reactions in others and result in a self-perpetuating cycle of depressive symptomatology. Finally, although several defenses are frequently referred to as characteristic of persons with depression (e.g., Acting Out, Passive Aggression, Help-rejecting Complaining), Turning Against the Self (Devaluation of the Self) is the essential element across all theories.

Psychodynamic Theories of Anxiety[7]

There are a number of psychodynamic theories related to anxiety. Each one differs in focus depending on the type of anxiety being considered (e.g., Panic Disorder, Obsessive Compulsive Disorder). For the sake of brevity, I will focus on a more thorough review of one anxiety disorder in particular. Because it has generated the most theoretical and research papers in relation to defenses, the psychodynamic theory of anxiety I will review is that related to Panic Disorder. Busch and colleagues (1991; 1999; Shear, Cooper, Klerman, Busch, & Shapiro, 1993)

[7] The term "anxiety" will be used to refer to anxiety disorders in general. The names of specific diagnoses such as Panic Disorder, Generalized Anxiety Disorder and Obsessive Compulsive Disorder will be used where applicable.

delineated a comprehensive psychodynamic theory of Panic Disorder. Like Rudden and colleagues (2003) argued in their theory of depression, Busch and colleagues (1991) begin by writing that much can be learned from alternative perspectives on Panic Disorder. They note that genetics from the neurophysiological perspective and catastrophic misinterpretations from the cognitive behavioural perspective are well-supported and meaningful in understanding Panic Disorder and that trying to explain disorders solely with psychodynamics alone is a significant error (Busch et al, 1991; Rudden et al., 2003). They write further, however, that psychodynamic theory might be a useful tool in explaining why the lives of persons with Panic Disorder involve so much misinterpretation (Busch et al., 1991).

Busch and colleagues (1999) noted that years of clinical observations indicate that separation and independence fantasies are common among persons with Panic Disorder. They further noted that these same patients have been found to have difficulty tolerating angry feelings and thoughts toward significant others (Busch et al., 1991; 1999; Shear et al., 1993). Based on this and other evidence, they hypothesized that panic attacks serve a self-punitive function in which persons atone for their guilty transgressions (e.g., angry impulses towards significant others; Busch et al., 1999). These fears of separation and anger are therefore central to panic onset and persistence.

Busch and colleagues (1991; 1999; Shear et al., 1993) write that the difficulty tolerating angry feelings usually starts early in life with fearful dependence, which can either be inborn or result from actual or perceived trauma. The person then begins to perceive others as providing inadequate attention and protection and therefore become angry at the important others (e.g., parents). This anger is initially unconscious and it triggers anxiety (i.e., signal anxiety) because of a fear that the anger will further disrupt relationships with loved ones and perhaps alienate them (Rudden et al., 2003; Shear et al., 1993). This anxiety and fear then leads to more fearful dependence, resulting in a self-perpetuation cycle of unconscious anger and conscious feelings of dependence (Busch et al., 1991; 1999; Rudden et al., 2003).

Busch and colleagues (1999) argue that although this fearful dependence relational pattern is set up early in life, it can be triggered in adulthood by life events. In support of their argument for relational patterns being present early in life, they note that observers from varied theoretical perspectives have written about premorbid personality traits such as pervasive unassertiveness, fearfulness, and dependency in persons with Panic Disorder (Busch et al., 1991)

and that many patients describe themselves as fearful, nervous, or shy as children (Shear et al., 1993). In an effort to manage the anxiety, the person often utilizes Reaction Formation and Undoing in an effort to strengthen attachment relationships and prevent the anger from becoming conscious. The unconscious nature of the angry feelings, however, results in an inability to modulate the experienced threat to the attachment with the significant other fully, and thus results in panic symptoms (Busch et al., 1999).

In addition to unconscious anger, avoidance of the unfamiliar prevents the person from learning to predict threats and from developing more mature defense mechanisms (Shear et al., 1993). As a result the person remains reliant on the more immature defenses they already possess (Shear et al., 1993). An effort of the more primitive defenses to deny the presence of negative affects may mean that somatic aspects become the focus of attention, leading to the catastrophizing noted by many researchers and clinicians (Shear et al., 1993). Shear and colleagues note that their model predicts that those with Panic Disorder would use more immature defenses than would a "normal comparison group" and that those with Panic Disorder would differ from other psychiatric groups on their defense use.

Those with Panic Disorder are hypothesized to use defenses that protect the relationship with the needed object against strain from the person's angry impulses and feelings (Bush, Shear, Cooper, Shapiro, & Leon, 1995). Persons with Panic Disorder can be expected to rely more heavily on defenses such as Denial, Displacement, Reaction Formation, and Undoing. Denial allows the person to acknowledge that the anxiety provoking event occurred, but then to deny any of the threatening impulses that resulted from it, thereby preserving the important relationship with the needed other. Displacement allows the person to redirect anger from the close object towards a less threatening object, which preserves the close relationship with the target. Similarly, Reaction Formation allows the person to reject the anger directed at the close other while at the same time strengthening the bond with the display of the opposite emotion. Undoing is used to make amends for the anxiety-provoking feelings felt toward the close object symbolically (Busch et al., 1991; 1995; Rudden et al., 2003).

Busch and colleagues (1991; 1999) argue that *DSM-IV* emphasis on symptoms coming "out of the blue," is actually just a lack of conscious awareness of the stressors and the intrapsychic conflict that led to the symptoms. They cite literature suggesting that even if persons do not cite or are not aware of the effects of events in their lives, there is often identifiable "life

events" that occur just prior to the panic onset (Busch et al., 1991; 1999). They also note that many persons with Panic Disorder will initially deny pre-existing anxiety, or deny a relation between panic and stressful life events, only later to realize in therapy that this denial was untrue (Shear et al., 1993). These life events often involve major changes and threats to security such as loss, rejection, a change of job, or increased expectations (Busch et al., 1991). Often the defenses are forming a "compromise formation", which involves trying to manage angry impulses as well as feelings and fantasies stemming from the id with fears of abandonment stemming from an overly harsh superego (Busch et al., 1999). This compromise formation is described as the "least unpleasurable" solution. Sometimes the panic symptoms themselves serve as a less distressing alternative to undistorted angry impulses towards important others (Busch et al., 1999). For example, angry impulses directed at a loved one, perhaps even unconscious wishes for their death can be managed by a panic attack. This would then make the individual feel weak and unable to bring about the death of the more powerful loved one (Busch et al., 1999; Rudden et al., 2003).

In summary, inborn fearfulness followed by excessive fearfulness of the unknown as a child lead to heightened dependency on the parents. Since parents will invariably fail at always being available, the child is left feeling ashamed, helpless, and incapable of handling the unfamiliar. This fearfulness is blamed on the parent who is seen as the source of the anxiety. This anger toward the parent is threatening to the relationship the person has become dependent on and defense mechanisms such as Denial, Displacement, Reaction Formation, and Undoing are used to minimize conflict resulting from these angry impulses. The internal representation of others as controlling continues on into adulthood where any sufficient threat to attachment can trigger the cycle anew.

Comparative Summary of Depression and Anxiety Theory

Both depression and Panic Disorder involve difficulties with self-esteem regulation and guilt over aggression. The most apparent difference between the two disorders is how the guilt over aggression towards others is managed. In depression, guilt is primarily turned towards the self or managed via other immature defenses. In Panic Disorder, however, the aggression is reversed, denied, or diverted to less threatening others in an effort to preserve the relationship (Busch et al., 1991; 1999; Rudden et al., 2003). Whereas depression is related primarily to

increased use of immature defenses, Panic Disorder is related primarily to increased use of neurotic defenses.

RESEARCH

General Research on Defenses

In the century since Freud originally identified the concept, there has been numerous research studies investigating defenses. With regard to Freud's writings on defense mechanisms and psychopathology, Baumeister and colleagues (1998) note that "any accuracy at all would be impressive" (p. 1083) given the advances in knowledge and science itself over that period. In fact, as will be apparent through this literature review, many of Freud's original defense mechanisms can be said to have substantial support and evidence of their existence and function. Moreover, this evidence can be found not only from psychodynamic or even clinical researchers, but also from related fields such as cognitive and social psychology working with "normal" participants (Baumeister et al., 1998; Norem, 1998; Paulhus et al., 1997). Impressively, Freud's late 19th century observations of persons suffering from severe psychopathology remain informative over 100 years later in understanding both normal and abnormal personality functioning (Baumeister et al., 1998). The following research is a brief summary of relevant defense research.

Methods to Assess Defenses

Although Freud did not develop a formal method by which to identify defenses, many different approaches have since been developed to achieve this goal (Perry & Ianni, 1998). The three main methods used to assess defenses are projective tests, self-report, and observer report (Perry, 1990; Skodol & Perry, 1993). The first method to assess defenses, projective tests, follows directly from psychoanalytic literature. One projective instrument from which defenses are frequently assessed is the Thematic Apperception Test (TAT; Morgan & Murray, 1935). The most frequently used defense mechanism scoring system for the TAT uses the Defense Mechanism Manual (Cramer, 1991). Participants are shown TAT cards (black & white pictures with ambiguous social situations) and are asked to explain what is happening in the scene. Participants' responses are transcribed and then coded for defenses using the Defense Mechanism Manual, which is based on factors such as omissions and misperceptions. For example, if a person did not mention a prominently placed weapon in a card, then the defense Denial would be coded.

One strength of projective measures is that they are more theoretically supported than some other methods of assessing defenses (e.g., self-report) since they involve the interpretation of unconscious material (Davidson & MacGregor, 1998; Perry & Ianni, 1998). Additionally, projective measures typically have well-defined testing situations and involve minimal influence by the tester (Perry & Ianni, 1998). Limitations, however, include the labour intensiveness of projective testing and the fact that projective testing is not as conducive to large scale testing as other methods of assessing defenses (Perry & Ianni, 1998). Also, most projective measures require an extensively trained researcher or clinician to test participants individually and scoring these measures can be very time consuming.

A second method of assessing defenses is the self-report method. Using this approach participants are given a number of situations or statements and asked to rate how likely each one is for them. Responses are then combined to create scores for different individual defenses or for different defense styles (see Table 2). One of the most common self-report methods of assessing defense mechanisms is the Defense Style Questionnaire[8] (DSQ; Bond et al., 1983). The DSQ has 72 statements that participants respond to using a Likert scale ranging from 1 (*strongly disagree*) to 9 (*strongly agree*). Examples of DSQ statements are "I'd rather starve than be forced to eat" (Passive Aggression) and "If someone mugged me and stole my money, I'd rather he be helped than hurt" (Reaction Formation).

Strengths of the self-report approach include the relative ease of self-report data collection from large groups of participants and the minimal amount of training that is needed on the part of those administering the measure (Bond et al., 1983). It is easy to ensure each participant receives a standardized presentation and therefore observer and experimenter effects are greatly reduced. As well, scoring is relatively straightforward and not overly time-consuming. Finally, self-report does not require independent observers like some other methods and therefore the difficulties with low inter-rater reliability between observers are avoided (Bond et al., 1983; Skodol & Perry, 1993).

A limitation of this approach is that it is questionable whether the self-report questionnaires actually elicit defense mechanisms (Cooper & Kline, 1982). Also, as with most self-report questionnaires, social desirability is a concern. Participants may be choosing

[8] The DSQ has numerous versions assessing different defenses and defense styles. Following Bond (2004) these will be discussed interchangeably. The interested reader is directed to Appendix A for more details.

responses they feel are appropriate, thus making the data difficult to interpret (Cramer, 1991). This is supported in part by Besser and colleagues, who found that participants rate themselves higher on Mature Defense Style (Besser, 2004; Flett, Vredenburg, & Krames, 2005) and lower on Immature Defense Style (Flett et al., 2005) on the DSQ than their friends rate them. Finally, there has been much criticism of self-report measures of defenses because they purport to measure the unconscious in a conscious manner. Various researchers have argued that persons can recognize their behavioural patterns in hindsight (Andrews, Singh, & Bond, 1993; Bond et al., 1983), that persons' belief systems will be indicative of their pattern of defense use (Andrews, Singh, & Bond, 1993), that persons may be aware of "residuals" of their defensive behaviour (Punamaki et al., 2002), or that defensive behaviour might be pointed out to persons by those around them (Bond et al., 1983; Nishimura, 1998). Andrews and colleagues (1989) summarize the argument that persons can self-report defense use by stating that "the way one behaves under pressure is all too predictable, that one is all too aware of it, and relatively powerless to modify it" (p. 459). Although there is a general consensus that it is possible to assess some aspects of defensive behaviour through self-report (Bond et al., 1983; Corruble et al., 2003; 2004; Sammallahti, Aalberg, & Pentinsaari, 1994; Wastell, 1999), questions remain as to whether specific defenses such as Repression or Denial inherently interfere with self-report. (Besser, 2004; Brody et al., 2003; Cooper et al., 1991; Cramer 1998a; 1998b; Joiner et al., 2000; Kwon, 1999; Norem, 1998; Skodol & Perry, 1993).

The final method to assess defenses is the observer report method. In early defense mechanism research the observer report method was the most widely used with patient samples (Skodol & Perry, 1993). The observer report method involves participants being rated by trained observers for their defense use. An example of this approach is Davidson and MacGregor's (1996) Defense-Q. Using this instrument, observers rate participants for their relative use of 25 defenses using a Q-sort. The Q-sort profile of 25 defenses can then be compared between participants to norms or to theoretical profiles.

A strength of this approach is that less training is required on the part of the observer than with projective assessment. In addition, observer report methods such as the Defense-Q involve a rater who is inferring defense use from the participant's behaviour. This inference allows for the assessment of behavioural manifestations of unconscious material. This assessment of unconscious material is consistent with psychodynamic theory and allows for assessment of

defenses that are more difficult to assess through some other methods (e.g., Repression or Denial). In addition, the utilization of an independent observer reduces concerns of social desirability of the respondent.

Limitations of this approach include that it is more labour intensive to score than self-report methods and that participants must be observed and coded individually, thus making large sample sizes difficult to obtain (Davidson & MacGregor, 1998). Secondly, although the addition of an independent observer addresses some of the limitations of other methods (e.g., self-report) it also introduces difficulties such as low inter-rater reliability (Perry & Ianni, 1998; see Measures section for further discussion of inter-rater reliability). Finally, some observer report methods require up to 20 hours worth of clinical data per person to assess defense mechanisms reliably (Skodol & Perry, 1993).

There are three main methods to assessing defense mechanisms. Each method has strengths and weaknesses. While some methods such as self-report are especially conducive to large-scale testing, others are much more labour intensive and make large-scale testing difficult. Methods such as observer report are recommended because they involve outside observers interpreting unconscious material, but with the interpretation comes difficulties with inter-rater reliability. Given the strengths and weaknesses of the different methods, it is recommended that research with defense mechanisms utilize more than one method in each study (Davidson & MacGregor, 1998; Perry & Ianni, 1998).

Research on Defenses and Psychopathology

As there is an abundance of research involving defenses and psychopathology in general and depression and anxiety specifically, the following review will focus on two of the most often used measures. As self-report has become the most common method of assessing defenses, I will review research involving the most commonly used self-report measure, the Defense Style Questionnaire (DSQ). In addition, as observer report measures were once the most commonly used method and are currently the most applicable method to clinical work, I will review literature pertaining to the most commonly used observer report measure, DMRS, as well as literature related to the *DSM* Defensive Functioning Scale, which is based on the DMRS.

Defense Mechanisms and General Psychopathology

Defenses and Psychopathology Scores in Patient Populations

Several researchers have examined the relation between defense styles from the DSQ and symptom indices from the Symptom Check List – 90 (SCL-90) or Symptom Check List–90–Revised (SCL-90-R). While some authors (e.g., Holi et al., 1999) note that numerous studies have failed to replicate the factor structure of the SCL-90-R scales, that the scales are highly intercorrelated, and that many researchers have noted that the scales (e.g., depression, anxiety) do not actually assess what they are named after, a few researchers continue to use the individual scales. Most, however, use only the Global Severity Index (GSI), which is a measure of overall severity of symptomatology. Caution is warranted in interpreting the individual scales.

Defenses have been compared to symptoms assessed by the SCL-90 in outpatients (Holi et al., 1999), patients with neurosis (Sammallahti, Holi, Komulainen, & Aalberg, 1996), patients with personality disorders (Sammallahti et al., 1996), patients with any mental health diagnosis (Spinhoven et al., 1995), patients without a mental health diagnosis (e.g., a V-Code; Spinhoven, van Gaalen, & Abraham, 1995), and community control participants (Holi et al., 1999; Muris & Merckelbach, 1996; Sammallahti et al., 1996; Spinhoven et al., 1995). Results indicate that those persons using an Immature Defense Style (i.e., scoring higher than 0.5 *SD* above the mean; Bond et al., 1983; Bond & Perry, 2004) report the most severe symptomatology on all nine SCL-90 scales (i.e., Somatization, Obsessive Compulsive, Interpersonal Sensitivity, Depression, Anxiety, Hostility, Phobic Anxiety, Paranoid Ideation, & Psychoticism), followed by those that used a Neurotic Defense Style, those who do not predominantly engage in any particular defensive style, and finally followed by those using a Mature Defense Style (Holi et al., 1999). The use of Mature Defense Style has been found to be negatively related to all nine SCL-90 scales while Neurotic, Immature, and Borderline Defense Style have been found to be positively related to all SCL-90 scales (Sammallahti et al., 1996).

Most defense research using the SCL-90 focuses on the GSI score. Researchers have found the GSI to be negatively related to Mature Defense Style (Spinhoven et al., 1995) and positively related to Neurotic (Sammallahti et al., 1996; Spinhoven et al., 1995), Immature (Sammallahti et al., 1996; Spinhoven et al., 1995), and Borderline Defense Styles (Sammallahti et al., 1996). Looking at individual defense mechanisms, researchers have found the GSI to be

negatively related to Humour and positively related to Acting Out, Devaluation, Fantasy, Passive Aggression, Projection, Somatization, and Undoing (Muris & Merckelbach, 1996).

Researchers have also examined the extent to which variance in GSI scores can be accounted for by defenses. The Immature Defense Style consistently accounts for the most variance (Holi et al., 1999; Sammallahti et al., 1996) followed by the Mature (Holi et al., 1999) and Neurotic Defense Styles (Holi et al., 1999). For individual defense mechanisms researchers have found that (in descending order) Devaluation, Passive Aggression, Somatization, Acting Out, and Humour all accounted for a significant amount of the variance in GSI scores even after controlling for general levels of neuroticism (Muris & Merckelbach, 1996).

Defenses and Psychopathology Differentiation

Researchers have found that defense mechanisms can be used to differentiate persons with different mental health diagnoses and varying levels of psychopathology. For example, using DSQ defense styles, researchers have been able to differentiate between participants in control, neurotic, high functioning personality disorder, and low functioning personality disorder groups (Sammallahti et al., 1994), and between control participants, patients with no mental health diagnosis, and patients with a mental health diagnosis (Spinhoven et al., 1995).

Early attempts to differentiate participants based on disorders were not successful. For example, using the five defense level version of the DMRS, Perry and Cooper (1986) attempted to differentiate persons with three similar mental health diagnoses (Borderline Personality Disorder, Antisocial Personality Disorder, & Bipolar II Disorder) using a discriminant analysis. Only 8 to 10 participants with each disorder were involved in the study (total sample = 27 patients across 3 groups), which may have contributed to the null findings. It should be noted, however, that despite the small group sizes, the participants were successfully differentiated on five psychodynamic conflicts (Perry & Cooper, 1986).

Summary

Defense styles as well as individual defenses display a generally consistent relation across various indices of symptomatology. Research using the SCL-90/SCL-90-R has demonstrated that all types of symptoms are negatively related to Mature Defense Style and mature defenses and positively related to Neurotic, Immature, and Borderline Defense Styles and defenses on the DSQ. Defense styles (at least from the DSQ) have been shown to differentiate

participants with various disorders from community participants, patients not warranting a psychiatric diagnosis, and from those with other diagnoses.

Depression

Depression Scores and Defenses in Nonclinical Samples

Researchers have investigated the relation between DSQ defenses and depression scores on a number of measures in a wide variety of samples. Depression measures used include the Beck Depression Inventory/Beck Depression Inventory-2 (Flannery & Perry, 1990; Kwon, 2000; Kwon & Lemon, 2000; Oakley et al., 2005), Brief Symptom Inventory (BSI; Watson, 2002); Center for Epidemiological Studies - Depression (CES-D; Besser, 2004; Flett, Besser, & Hewitt, 2005), and the Minnesota Multiphasic Personality Inventory (MMPI; Nishimura, 1998). The samples examined include college students from Canada (Watson, 2002), Japan (Nishimura, 1998), and the United States (Flannery & Perry, 1990; Kwon, 2000; Kwon & Lemon, 2000), as well as low-income African American women (Oakley et al., 2005), and former members of the Israeli army (Besser, 2004; Flett, Besser, & Hewitt, 2005).

Depression scores have been found to be negatively related to the Mature (Kwon, 2000; Kwon & Lemon, 2000; Oakley et al., 2005) and the Self-sacrificing Defense Style (Flannery & Perry, 1990), and positively related to the Image Distorting (Flannery & Perry, 1990), Maladaptive (Flannery & Perry, 1990), Neurotic (Flett et al., 2005), Immature (Besser, 2004; Flett et al., 2005; Kwon, 2000; Kwon & Lemon, 2000; Nishimura, 1998; Oakley et al., 2005), and Emotion Avoiding Defense Styles (Besser, 2004). Both Besser (2004) and Flett and colleagues (2005) used self- and friend reporting of depression and defenses. While the above mentioned relations from Flett and colleagues were consistent across both types of ratings, self (but not friend) ratings of depression were *positively* related to self (but not friend) ratings of Mature Defense Style (Flett, et al., 2005). The authors argue that this is an indication that participants overestimate their use of mature defenses while outside observers (e.g., friends) provide a more accurate portrayal of their defense use.

Researchers have also investigated the relation between depression scores and individual defenses. For example, Watson (2002) examined the extent to which individual defenses could account for the variance in depression scores. Results (in descending order) indicate that Displacement, Projection, Fantasy, (negative) Denial, and Somatization contributed to the

variance in depression scores for females and Projection, Fantasy, (negative) Humour, Somatization, Isolation, and (negative) Dissociation contributed for males (Watson, 2002).

In summary, across numerous measures of depression, various countries, and diverse samples, DSQ defenses have demonstrated a relatively consistent relation with depression scores in nonclinical samples. Depression scores are negatively related to Mature Defense Style and defenses and positively related to Neurotic and Immature Defense Styles and defenses. In addition, those defenses accounting for the largest proportion of variance across sex are the Immature Defense Style and individual defenses of Fantasy, Projection, and Somatization. Other defenses that were related to depression include lower use of Denial, Dissociation and Humour as well as higher use of Displacement and Isolation. These studies have exclusively used self-report measures of defenses and primarily assessed broad defense levels rather than individual defenses. The one study that did examine individual defenses identified participants in the depressed group using the BSI. The BSI is a shorter form of the SCL-90-R, which has been demonstrated to be problematic when using the individual scales to identify particular disorders (Holi et al., 1999).

Diagnosed Depression

Presence Versus Absence of Mood Disorder

Many researchers have investigated the difference in defense use between those with and without a mood disorder diagnosis. Early work (e.g., Bond & Vaillant, 1986) showed no difference in defense use between those with and without a mood disorder diagnosis. Researchers (Spinhoven & Kooiman, 1997) noted, however, that a small sample size (n = 16 in mood disorder group) may have led to the null findings. Later research revealed that patients with Major Depressive Disorder (MDD) have been shown to rely less on a Mature Defense Style (Akkerman, Carr, & Lewin, 1992; Akkerman, Lewin, & Carr, 1999; McMahon, Barnett, Kowalenko, & Tennant, 2005; Milgrom & Beatrice, 2003), and more on Neurotic (Akkerman et al., 1992; Milgrom & Beatrice, 2003) and Immature/Maladaptive Defense Styles (Akkerman et al., 1992; Kennedy et al., 2001; McMahon et al., 2005; Milgrom & Beatrice, 2003; Spinhoven & Kooiman, 1997) than persons in the control group.

Researchers have also examined differential use of individual defenses between those with and without a diagnosis of a mood disorder. Milgrom and Beatrice (2003) found that mothers diagnosed with MDD scored lower on Humour and Suppression and higher on Somatization at 3

months postbirth than did mothers with no diagnosis. Spinhoven and Kooiman (1997) found that persons with Dysthymic Disorder used Devaluation, Isolation, and Somatization more than persons in the control group. Perry and Cooper (1986) noted that presence of chronic depression was positively correlated with Devaluation, Passive Aggression, and Hypochondriasis. Perry (Perry & Kardos, 1995) notes that he also found Devaluation, Passive Aggression, and Hypochondriasis to be more common in persons with Dysthymic Disorder than persons with Panic Disorder (Bloch, Shear, Markowitz, Leon, & Perry, 1993).

Depression Scores

Numerous researchers have examined the relation between defense mechanisms and severity of depressive symptomatology in individuals with diagnoses of MDD. Depression symptom severity has been assessed with the CES-D (McMahon et al., 2005) Hamilton Rating Scale for Depression (Corruble et al., 2004), the Personality Assessment Inventory (PAI; DeFife & Hilsenroth, 2005), the SCL-90-R Depression scale (DeFife & Hilsenroth, 2005; Hilsenroth, Callahan, & Eudell, 2003; Holi et al., 1999), and the SCL-90-R GSI (DeFife & Hilsenroth, 2005; Hoglend & Perry, 1998). Results indicate that depression severity is negatively related to use of a Mature Defense Style (Corruble et al., 2004; McMahon et al., 2005) and Overall Defensive Functioning (ODF; Hoglend & Perry, 1998; Perry & Hoglend, 1998) and positively related to Neurotic (McMahon et al., 2005) and Immature Defense Styles (McMahon et al., 2005) on the DSQ. Similarly, depression severity has been found to be negatively related to Mental Inhibitions Level – Obsessive Defenses (DeFife & Hilsenroth, 2005), and ODF (DeFife & Hilsenroth, 2005; Hilsenroth et al., 2003), and positively related to Action Level Defenses (DeFife & Hilsenroth, 2005) on the *DSM-IV-TR* Defensive Functioning Scale, which is based on the DMRS. DeFife and Hilsenroth note that presence of low-level defenses appears to be a poor prognostic sign while presence of at least some higher level defenses is a good prognostic sign. Midlevel defenses (i.e., those not at the extremes of the hierarchy) do not appear to be consistently related to depression symptomatology (DeFife & Hilsenroth, 2005).

Researchers have found depression severity to be negatively related to the individual defenses Humour and Sublimation and positively related to use of Projection as assessed by the DSQ (Corruble et al., 2004). Additionally, Holi and colleagues (1999) found Displacement to account for the most variance in depression scores, followed by Projection, Somatization, Fantasy, and Anticipation using the DSQ. The authors note that the defense that accounted for

the most variance, Displacement, contains items about drinking alcohol, using drugs, eating, and daydreaming to relieve anxiety. In the original version of the DSQ, these items were related to Consumption and Fantasy. The concern raised by the researchers is that the Displacement items on this version of the DSQ may be more indicative of depression related behaviours than of the defense Displacement (Holi et al., 1999). These items were dropped in subsequent versions of the DSQ.

Defense Change with Treatment for Depression

A number of studies have been conducted to examine the extent to which defenses change after treatment for depression. Researchers have found an increase in the use of a Mature Defense Style at treatment termination (Kneepkens & Oakley, 1996), and at 1 month (Bronnec et al., 2005), 6 months (Akkerman et al., 1999), and 2 years (Akkerman, et al., 1999) post-treatment. Researchers have also found a reduced reliance on Immature Defense Style at treatment termination (Kneepkens & Oakley, 1996; Mullen, Blanco, Vaughan, Vaughan, & Roose, 1999), and at 1 month (Bronnec et al., 2005), 2 months (Akkerman et al., 1992), and 2 years (Akkerman et al., 1999) post-treatment. Finally, researchers have found an increase in the ODF Scale of the DSQ at the termination of 10-12 weeks of depression treatment (Mullen, et al., 1999). While some authors (e.g., DeFife & Hilsenroth, 2005) have argued that change found in 7 days of treatment (e.g., Kneepkens & Oakley, 1996) is an indication that the DSQ is assessing acute state reactions as opposed to the trait like personality variables like defenses, evidence from longer follow-ups suggest that lasting change does occur with treatment (Bond & Perry, 2004).

With regard to individual defense mechanisms, researchers have found that, post-treatment, patients' self-report indicated an increase in the use of Humour, Sublimation, and Suppression and a decrease in the use of Denial, Fantasy, Idealization, and Passive Aggression (Bronnec et al., 2005). Informant ratings (family members rating the patient on the DSQ) indicated an increase in Anticipation, Humour, Sublimation, and Suppression as well as decreased use of Dissociation, Passive Aggression, Projection, and Splitting post-treatment (Bronnec et al., 2005).

Noting that not all patients improved with treatment, some researchers (e.g., Hoglend & Perry, 1998; Mullen et al., 1999) have examined differences in the defenses of those that improve with therapy compared to those that do not. With regard to defense styles on the DSQ, Mullen and colleagues (1999) noted that that those that completed treatment relied less on Image

Distorting defenses than those that dropped out. Moreover, those that responded to treatment used less maladaptive defenses at the end of treatment than those that did not and had a healthier ODF than did those that did not respond (Mullen et al., 1999).

Looking at individual defenses from the DMRS, Hoglend and Perry (1998) examined whether previous researchers' (Bloch et al., 1993, Perry, 1990; Perry & Cooper, 1986; 1989) findings that eight immature defenses (i.e., Passive Aggression, Acting Out, Help-rejecting Complaining, Projective Identification, Splitting of Self-images, Splitting of Others' Images, Projection, & Devaluation) rated by the DMRS played a causal role in the functional outcome of those diagnosed with MDD. Hoglend and Perry found that the eight immature defenses were found more often in those that changed less than predicted by their GAF scores than those that improved more than predicted by their GAF scores. No difference was found in the use of other immature defenses between the groups. Perry and Hoglend argue that this is evidence that it is these eight immature defenses in particular and not simply immature defenses in general that have a role in the development and maintenance of MDD. Additionally, Self-observation was found to be higher in those that improved in treatment than those that did not.

Bond (2004) notes that evidence suggests that use of immature and mature defenses changes during therapeutic treatment for depression whereas use of neurotic defenses such as Reaction Formation, Pseudoaltruism, Primitive Idealization and Undoing does not change. He argues that neurotic defenses might be more characteristic of personality than defenses such as Suppression and Acting Out (Bond, 2004). This is consistent with the aforementioned research that demonstrates that depression is primarily related to Mature and Immature Defense Styles and defenses and much less often related to Neurotic Defense Style and defenses.

Differential Defense use Within Mood Disorders

Perry and Hoglend (1998) further found that the DMRS ODF was negatively related to severity of depression (i.e., no symptoms, Dysthymic Disorder diagnosis, or MDD diagnosis). Corruble and colleagues (2003) found the Immature Defense Style to be higher in those with recurrent depressive episodes than those with only a single episode. Additionally, those with recurrent episodes were higher on Denial, Fantasy, Projection, and Somatization (Corruble et al., 2003). In sum, defense use between different mood disorder groups may vary with severity and chronicity of symptomatology.

Summary

In summary, presence as well as severity of a mood disorder has been negatively related to the Mature Defense Style and positively related to the Neurotic and Immature Defense Styles. Depression severity has also been positively related to Action Level Defenses and negatively related to the Mental Inhibitions Level and ODF on the DMRS and ODF on the DSQ. Recovery from depression has been related to a decrease in the use of an Immature Defense Style and an increase in the use of the Mature Defense Style and ODF. Similarly, high reliance on the Image Distorting and Maladaptive Defense Styles has been shown to be related to poorer prognosis for recovery. Research indicates that depression is negatively related to Anticipation, Humour, Self-observation, Sublimation, and Suppression, and positively related to Acting Out, Denial, Devaluation, Displacement, Dissociation, Fantasy, Hypochondriasis, Isolation, Idealization, Passive Aggression, Projection, Projective Identification, Splitting, and Somatization. Overall, depression seems to be related to greater use of immature defenses and less use of mature defenses. While numerous aspects of the relation between defenses and depressive symptomatology have been explored, more work remains to be done. Several of the defenses that are used more often by persons with depressive symptomatology are the same defenses used by persons with other disorders. This was previously noted by Offer and colleagues (2000) and remains an issue in need of further exploration. Secondly, while both observer and self-report measures were used in the aforementioned studies, none of these studies used both methods concurrently. This research provides a framework from which future hypotheses can be generated, but more work is needed to address unanswered questions.

Anxiety

Anxiety Scores in Nonclinical Samples

Researchers have investigated the relation between DSQ defenses and anxiety scores on various measures in a wide variety of samples. Anxiety measures used include the BSI (Watson, 2002), MMPI (Nishimura, 1998), State Trait Anxiety Inventory (STAI; Muris & Merckelbach, 1994), and the Taylor Manifest Anxiety Scale (Flannery & Perry, 1990). The samples examined include college students from Canada (Watson, 2002), Japan (Nishimura, 1998), and the United States (Flannery & Perry, 1990), as well as general members of the community and university staff (Muris & Merckelbach, 1994).

Anxiety scores have been found to be positively related to the Maladaptive/Immature (Flannery & Perry, 1990; Muris & Merckelbach, 1994; Nishimura, 1998), Neurotic (Muris & Merckelbach, 1994; Nishimura, 1998), and Image Distorting Defense Styles (Flannery & Perry, 1990). Interestingly, Flannery and Perry used both the 14 and 20 defense versions on the DSQ in their 1990 study. While the Mature Defense Style in the 14 defense version of the DSQ was not significantly related to anxiety scores, it was significantly *positively* related to anxiety scores with the 20 defense version.

Researchers have also investigated the relation between anxiety scores and individual defenses. For example, Muris and Merckelbach (1994) found that Projection accounted for the most variance in STAI scores, followed by, Somatization, Humour, Undoing, and Suppression. In a similar study Watson (2002) looked at anxiety related scales on the BSI using stepwise multiple regressions. For the Anxiety scale, in descending order of importance, Displacement, Somatization, Undoing, (negative) Denial, and Idealization contributed unique variance to Anxiety scores for females while Projection, Somatization, Pseudoaltruism, (negative) Suppression, and Passive Aggression contributed for males (Watson, 2002). For the OCD scale, in descending order of importance, Displacement, Undoing, Fantasy, Somatization and (negative) Denial contributed unique variance for females whereas Fantasy, Projection, and Splitting contributed for males (Watson, 2002). For the Phobic Anxiety scale, in descending order of importance, Displacement, Projection, Undoing, Anticipation, and Somatization contributed unique variance for females and Projection, Somatization, and (negative) Suppression contributed for males (Watson, 2002).

In sum, anxiety scores have been consistently found to be positively related to Immature/Maladaptive as well as Neurotic/Image Distorting Defense Styles. Interestingly, higher anxiety scores were also found to be related to higher usage of the Mature Defense Style in one study. In addition, anxiety scores have been found to be negatively related to Anticipation, Denial, Humour, and Suppression and positively related to Displacement, Fantasy, Idealization, Passive Aggression, Projection, Pseudoaltruism, Somatization, Splitting, and Undoing. Similar to the nonclinical depression research, the nonclinical anxiety research is exclusively self-report measures and primarily focused on defensive levels. Much of the individual defense research is based on anxiety symptomatology levels as assessed by the BSI, which, as mentioned, is problematic.

Diagnosed Anxiety

Overall Anxiety

Presence versus absence of an anxiety disorder. Several researchers have examined the defensive functioning of persons with a specific anxiety disorder. Looking broadly at several different anxiety disorders, Andrews and colleagues (Andrews, Singh, & Bond, 1993) found that defense use of combined groups of persons with an anxiety disorder (Panic & Agoraphobia, Social Phobia, or OCD) differed from defense use of control participants. Persons with an anxiety disorder scored lower on the Mature and higher on Neurotic and Immature Defense Styles than did control participants. Similarly, Spinhoven and Kooiman (1997), found that persons diagnosed with an anxiety disorder scored lower on Mature Defense Style and higher on the Neurotic and Immature Defense Style than did those in the control group.

Looking at individual defenses, persons with an anxiety disorder reported lower use of Humour (Andrews, Singh, & Bond, 1993; Pollock & Andrews, 1989), Sublimation (Andrews, Singh, & Bond, 1993), and Suppression (Andrews, Singh, & Bond, 1993; Pollock & Andrews, 1989) in comparison to persons in the control group. Persons with an anxiety disorder also indicated greater use of Devaluation (Andrews, Singh, & Bond, 1993; Pollock & Andrews, 1989), Displacement (Andrews, Singh, & Bond, 1993; Pollock & Andrews, 1989), Passive Aggression (Pollock & Andrews, 1989), Projection (Andrews, Singh, & Bond, 1993; Pollock & Andrews, 1989), Reaction Formation (Andrews, Singh, & Bond, 1993; Pollock & Andrews, 1989), Somatization (Andrews, Singh, & Bond, 1993; Pollock & Andrews, 1989), and Undoing (Andrews, Singh, & Bond, 1993) than did persons in the control group. Furthermore, Holi and colleagues (1999) found that Displacement accounted for the most variance in SCL-90-R Anxiety scores followed by Somatization, Projection, Dissociation, Sublimation, and Isolation (Holi et al., 1999).

Differential defense use within anxiety disorders. Examining whether the anxiety disorders could be differentiated from each other using defenses, Pollock and Andrews (1989) initially found DSQ defenses could be used to differentiate between persons with Agoraphobia, OCD, Panic Disorder, and Social Phobia diagnoses. A later reanalysis of Pollock and Andrews' data, however, revealed that removing 2 items from the DSQ that specifically tap OCD (i.e., item 78 "I have habits or rituals which I feel compelled to do or else something horrible will happen") and Social Phobia (i.e., item 41 "I'm very shy about approaching people") diagnostic criteria

resulted in no significant differences in the defense use among persons with different anxiety disorders (Andrews, Singh, & Bond, 1993).

Summary. In research where persons with anxiety disorders are grouped together, those with anxiety diagnoses have been found to rely less on the Mature Defense Style and more on Neurotic and Immature Defense Styles than do participants in a control group. Those with anxiety disorders have been found to score lower on Humour, Sublimation, and Suppression and higher on Devaluation, Displacement, Dissociation, Isolation, Passive Aggression, Projection, Reaction Formation, Somatization, and Undoing than participants in a control group. Moreover, although early work indicated it was possible to differentiate persons with different anxiety diagnoses based on defenses, later reanalyses that removed items linked to criteria indicated there was no significant difference in the defense profiles of persons with different anxiety disorders. Although a substantial amount of research has examined the relation between overall anxiety and both defense levels and individual defenses, this work has exclusively been using self-report. Adding observer report measures, especially assessed concurrently with a self-report measure, would add to the understanding of the relation between overall anxiety and defenses. Moreover, observer report measures might help to clarify whether anxiety disorders can be accurately differentiated based on defenses without the problematic DSQ items noted by Andrews, Singh, and Bond (1993).

Panic Disorder/Agoraphobia

As mentioned above, more research regarding the relation between defenses and Panic Disorder exists than with any other anxiety disorder. As such, I will provide a more thorough review of research related to Panic Disorder, followed by a brief summary of research related to defenses and other anxiety disorders.

Defense styles. Persons with Panic Disorder (with or without Agoraphobia) have been found to use the Mature Defense Style less (Andrews, Singh, & Bond, 1993) and the Neurotic (Andrews, Singh, & Bond, 1993; Kipper et al., 2004; 2005) and Immature/Maladaptive Defense Styles (Andrews, Singh, & Bond, 1993; Kennedy et al., 2001; Kipper et al., 2004; 2005; Spinhoven & Kooiman, 1997) more than control participants. It is noteworthy that only one of the three studies (i.e., Andrews, Singh, & Bond, 1993) found persons with Panic Disorder using Mature Defense Style less than control participants. The remaining studies (i.e., Kipper et al., 2004; 2005) demonstrated significantly higher scores on two of the four adaptive defenses for

persons with Panic Disorder compared to control participants. This pattern of relations approached significance in the *opposite* direction to the findings of Andrews, Singh, and Bond.

Individual defense mechanisms. Persons with Panic Disorder/Agoraphobia used Humour (Andrews, Singh, & Bond, 1993; Pollock & Andrews, 1989) and Suppression (Andrews, Singh, & Bond, 1993; Pollock & Andrews, 1989) less than did those in the control group. Persons with Panic Disorder/Agoraphobia also used Acting Out (Kipper et al., 2004; 2005), Devaluation (Andrews, Singh, & Bond, 1993; Spinhoven & Kooiman, 1997), Displacement (Pollock & Andrews, 1989), Fantasy (Kipper et al., 2004; 2005), Idealization (Kipper et al., 2005; Spinhoven & Kooiman, 1997), Passive Aggression (Kipper et al., 2005), Projection (Andrews, Singh, & Bond, 1993; Kipper et al., 2005), Pseudoaltruism (Kipper et al., 2005), Reaction Formation (Andrews, Singh, & Bond, 1993; Pollock & Andrews, 1989), Somatization (Andrews, Singh, & Bond, 1993; Kipper et al., 2004; 2005; Pollock & Andrews, 1989; Spinhoven & Kooiman, 1997), Splitting (Kipper et al., 2005), and Undoing (Kipper et al., 2004; 2005) more than did those in the control group. Kipper and colleagues (2004; 2005) found persons with Panic Disorder used Sublimation and Anticipation more than did those in the control group whereas Andrews and colleagues (Andrews, Singh, & Bond, 1993; Pollock & Andrews, 1989) found that persons with Panic Disorder used Sublimation and Anticipation less than did those in the control group.

Defense change with treatment for Panic Disorder. In a study on psychotherapy treatment for persons with Panic Disorder, Heldt and colleagues (2003) found that patients with higher pre-treatment levels of Neurotic and Immature Defense Styles had poorer outcomes than those with lower scores. Kipper and colleagues (2005) noted that persons with Panic Disorder reported increased usage of Neurotic and Immature Defense Styles at pre-treatment assessment compared to those in the control group. Post-treatment, those that improved in therapy no longer showed any significant differences from those in the control group on any defense style. With regard to individual defenses, those who were successfully treated for Panic Disorder continued to report higher use of Sublimation and Anticipation than did those in the control group and at post-treatment reported lower use of Humour than those in the control group (Kipper et al., 2005).

Summary. In summary, persons with Panic Disorder have been found to rely more on Neurotic and Immature Defense Styles than persons in control groups. There is also some mixed evidence that they may rely less on Mature Defense Style than persons in a control group. Those

persons that respond to treatment for Panic Disorder return to similar defense use as those in a control group. With regard to individual defenses, Panic Disorder seems to be related to lower use of Humour and Suppression and increased use of Acting Out, Devaluation, Displacement, Fantasy, Idealization, Passive Aggression, Projection, Pseudoaltruism, Reaction Formation, Somatization, Splitting, and Undoing. Panic Disorder has also been shown to be related to both higher and lower use of Anticipation and Sublimation. To explain the counterintuitive relation with mature defense, Kipper and colleagues (2005) argue that higher use of some adaptive defenses in persons with Panic Disorder compared to those in the control group might be indicative of a generally higher use of defenses overall in an effort to minimize anxiety. In other words, patients with Panic Disorder might not have "more adaptive" defense use, they may just have a reasonably adaptive defense use that is more active than the defense use of those in the control group. This theory has been supported by the findings of other researchers (e.g., Kennedy et al., 2001). Although Panic Disorder has had a substantial amount of research investigating its associated defense level and individual defense relations, this research has been entirely based on self-report defense assessment. Including the use of an observer report measure such as the DMRS would allow for determining the number of defenses used as well as the proportional defense use. This would aid in the determination of whether the mixed results are due to increased defense use overall or perhaps are indicative of differences in proportional defense use.

Obsessive Compulsive Disorder (OCD)

Andrews and colleagues (1989; 1993) found persons diagnosed with OCD to use the Mature Defense Style (Andrews et al., 1989; Andrews, Singh, & Bond, 1993) significantly less than controls. Treatment for OCD has been shown to address this deficit in use of Mature Defense Style, with usage returning to the level of those in the control group (Albucher, Abelson, & Nesse, 1998). Looking at individual defenses, Andrews found persons with OCD use less Humour (Andrews, Singh, & Bond, 1993; Pollock & Andrews, 1989), Suppression (Andrews, Singh, & Bond, 1993), and Sublimation (Andrews, Singh, & Bond, 1993) and more Acting Out (Andrews, Singh, & Bond, 1993), Devaluation (Andrews, Singh, & Bond, 1993), Projection (Andrews, Singh, & Bond, 1993; Pollock & Andrews, 1989), and Undoing (Pollock & Andrews, 1989), than those in the control groups. Treatment for OCD has been shown to result in a reduction in the use of the individual defense Undoing (Albucher et al., 1998). Holi and colleagues (1999) found that the DSQ defenses of Projection, Displacement, Fantasy, and

Somatization all accounted for significant amounts of the variance in SCL-90-R Obsessive Compulsive scores.

Social Phobia

Persons with Social Phobia have been found to rely less on the Mature (Andrews et al., 1989; Andrews, Singh, & Bond, 1993) and more on the Image Distorting (Kennedy et al., 2001), Neurotic (Andrews, Singh, & Bond, 1993) and Immature/Maladaptive Defense Style (Andrews et al., 1989; Kennedy et al., 2001) than those in a control group. With regard to individual defenses, those with Social Phobia report using less Anticipation (Andrews, Singh, & Bond, 1993), Dissociation (Andrews, Singh, & Bond, 1993), Humour (Andrews, Singh, & Bond, 1993; Pollock & Andrews, 1989), Sublimation (Andrews, Singh, & Bond, 1993), and Suppression (Andrews, Singh, & Bond, 1993), than those in a control group. Furthermore, persons with Social Phobia used more Devaluation (Andrews, Singh, & Bond, 1993; Pollock & Andrews, 1989), Displacement (Andrews, Singh, & Bond, 1993; Pollock & Andrews, 1989), and Reaction Formation (Andrews, Singh, & Bond, 1993) than did those in a control group.

Generalized Anxiety Disorder (GAD)

Kennedy and colleagues (2001) found that persons diagnosed with GAD scored higher on Maladaptive Defense Style than did those in the control group. For individual defenses, Yuan, Bao Zhang, and Qin Wu (2002) found persons with GAD scored higher on Affiliation and Undoing and lower on Humour than did those in the control group.

Post-traumatic Stress Disorder (PTSD)

Birmes and colleagues (2000) found that eight participants diagnosed with PTSD (6 to 12 months post-trauma) did not differ on Mature, Neurotic or Immature Defense Styles from a control group of 15 participants who experienced a trauma but did not develop PTSD. Analyses of specific defenses revealed that persons with PTSD had higher scores on Undoing than those without PTSD.

Summary of OCD, Social Phobia, GAD, PTSD, and Defenses

In terms of broad defense styles, persons with anxiety disorders appear to have relatively adaptive defense profiles in comparison to persons with other disorders. Persons with PTSD have not been found to differ on the use of defense styles when compared to those in a control group. Persons with OCD have been shown to rely less on the Mature Defense Style than those in a control group, but this difference disappears after treatment. In addition, persons with GAD have

been found to use the Maladaptive Defense Style more, but did not differ from those in a control group on Adaptive, Self-sacrificing, or Image Distorting Defense Styles. Persons with Social Phobia appear to have a somewhat more severe defense profile, relying less on the Mature Defense Style and more on the Neurotic and Immature Defense Styles than do persons in the control group.

With regard to individual defenses, those with PTSD show little difference in their defense use in comparison to those in a control group, only demonstrating a higher use of Undoing. Those with GAD have also been found to have elevated use of Undoing as well as higher use of one mature defense (i.e., Anticipation) and a lower use on another mature defense (i.e., Humour). Other disorders such as OCD and Social Phobia show somewhat more divergence from controls with regard to individual defenses. Those with OCD or Social Phobia rely less on Anticipation, Dissociation, Humour, Sublimation, and Suppression as well as more on Acting Out, Devaluation, Displacement, Fantasy, Projection, Reaction Formation, Somatization, and Undoing than do those in the control group. Across nearly all anxiety disorders, Undoing is consistently related to anxiety symptomatology. Given some of the previous research suggesting that there is substantial overlap between defenses use in people with different anxiety disorders, it is not surprising that there is limited research specifically examining defense use in a variety of different anxiety disorder groups. However, adding an observer report measure of defenses concurrently to these research studies might help clarify the relation between defensive functioning and anxiety symptomatology.

Studies Comparing Defense use in Depression and Anxiety

Defense Styles

Relatively little research has directly compared defense use in those with a depression or anxiety diagnosis. Like research on anxiety disorders and defenses in general most of the research has compared defense use of persons with a depression diagnosis to defense use of persons with Panic Disorder. Persons with Panic Disorder have been found to score higher on the Neurotic (Spinhoven & Kooiman, 1997) and Self-sacrificing Defense Styles (Kennedy et al., 2001) on the DSQ than did those with Dysthymic Disorder or MDD. In a similar study using the DMRS, those with Panic Disorder scored higher on ODF and lower on the Narcissistic, Disavowal, and Action Level Defense Styles than did persons with Dysthymic Disorder (Bloch et al., 1993). In addition to research on Panic Disorder, persons with a GAD diagnosis have been

found to rely more on the Self-sacrificing Defense Style than do persons with a diagnosis of MDD (Kennedy et al., 2001).

Individual Defenses

Persons with Dysthymic Disorder demonstrated higher use of Acting Out, Devaluation, Hypochondriasis, Passive Aggression, Projection, and Projective Identification (Bloch et al., 1993) on the DMRS and higher use of Isolation on the DSQ (Spinhoven & Kooiman, 1997) than did persons with Panic Disorder. Conversely, persons with Dysthymic Disorder demonstrated lower use of Reaction Formation and Undoing (Busch et al., 1995) on the DMRS and lower use of Idealization on the DSQ (Spinhoven & Kooiman, 1997) than did persons with Panic Disorder.

Summary

Persons with an anxiety disorder have been shown to use neurotic defense levels (i.e., Self-sacrificing & Neurotic Defense Level) more and Immature Defense levels (e.g., Narcissistic, Disavowal, & Action Level Defense levels) less than those with a depression diagnosis. This general pattern is mirrored with individual defenses in that those with anxiety diagnoses use the neurotic level defenses of Idealization, Reaction Formation, and Undoing more and the immature level defenses of Acting Out, Devaluation, Hypochondriasis, Isolation, Passive Aggression, Projection, and Projective Identification less than those with a depression diagnosis. Overall, evidence from studies comparing defense use in those with depression and anxiety symptomatology suggests that anxiety is related to a general pattern of more neurotic and less immature defense use than depression. Despite a somewhat limited amount of research in this area, the methodological variety is more impressive than for either depression or anxiety research alone. The studies comparing depression and anxiety groups on defensive functioning have included defense style and individual defense analyses as well as utilized observer and self-report measures. Combining both observer and self-report measures in a single study to examine the defensive functioning of those with depression or anxiety symptomatology is an important next step to extending this research.

SUMMARY OF DEFENSES, DEPRESSION, AND ANXIETY

With regard to specific defenses, an extensive overlap can be seen in defenses that are theoretically and empirically related to depression and anxiety. For depression, both theory and empirical research indicate an increased use of Denial, Devaluation (of the self), Help-rejecting Complaining/Hypochondriasis, Idealization, Passive Aggression, and Projection. Similarly, both

theory and empirical research have indicated anxiety symptomatology is related to increased use of Denial, Displacement, Reaction Formation, and Undoing. A general pattern can be noted that depression is primarily related to increased use of immature defenses and anxiety is related to increased use of neurotic defenses. This can also be seen when defense use and depression and anxiety are compared in the same study. In these studies depression is related to higher use of the immature defenses Acting Out, Devaluation, Help-rejecting Complaining/Hypochondriasis, Passive Aggression, Projection, and Projective Identification whereas anxiety is related to higher use of neurotic defenses such as Idealization, Reaction Formation, and Undoing. Commenting on this pattern in the literature, Kipper and colleagues (2005) write that there is abundant evidence that suggests an association between defenses and disorders such as depression and anxiety. Examining the studies, they argue "leads one to consider that immature defenses are more related to the depressive state and that the neurotic defenses are more associated with anxiety and its severity" (p. 623).

Although it appears depression and anxiety can be differentiated based on individual defense mechanisms, there is less evidence that the two types of symptomatology can be differentiated based on broader defense styles. Both depression and anxiety have been shown to be positively related to immature and neurotic level defense styles and negatively related to mature defense styles. Some studies, however, indicate that defense use in persons with depressive symptomatology may be more maladaptive overall (i.e., related to greater use of maladaptive defenses as well as less use of adaptive defenses) than defense use in persons with anxiety symptomatology. In addition, there is mixed evidence that suggests anxiety symptomatology may be positively related to increased adaptive defense use.

CURRENT INVESTIGATION

My research consists of two studies aimed at first examining how several measures of defenses relate to each other and second at investigating the utility of defenses in differentiating groups of individuals with anxious and depressive symptomatology. In the first study, I will look at the convergent validity of the Defense-Q and DSQ by comparing them to other well-established self-report and observer-report methods of assessing defenses. I will then briefly discuss the results of this study before moving on to present the second study. In Study 2, I will examine the extent to which defenses assessed by self-report (DSQ) and observer report (Defense-Q) are useful to discriminate between students with high depression scores and

students with high anxiety scores. Next, I will briefly discuss the results from the second study before finally moving on to a general discussion of conclusions based on the two studies combined.

STUDY 1

Although the current recommended standard in defense research is to use multiple measures of defenses, very little work has directly looked at the relation among the various measures of defenses. For example, no research currently exists examining the relation between the DMRS and Defense Mechanisms Inventory (DMI) or the Defense-Q. Understanding the differences due to the various methods and measures used to assess defenses is an important first step for interpreting results of defense mechanism investigations. It is difficult to understand and interpret results and the literature fully if one does not know how the defense measures used relate to each other as well as to other well-established measures of defenses. Therefore, in Study 1, I examined the relation among the self-report (i.e., DSQ) and observer report (i.e., Defense-Q) measures that I used in Study 2 and another commonly used self-report (i.e., DMI) and observer report (i.e., DMRS) measure of defenses.

Among defense measures, two that have been frequently used concurrently are the DSQ and the DMRS. Early work using the four-factor structure of the DSQ and six defensive levels of the DMRS (Action, Disavowal, Borderline, Narcissistic, Obsessional, & Mature Level) demonstrated limited overlap between the two measures. The DMRS Action Defense Level was positively related to the Maladaptive, Image Distorting, and Self-sacrificing Defense Styles (Bond et al., 1989). In addition, the DMRS Disavowal Defense Level was positively related to Self-sacrificing Defense Style on the DSQ (Bond et al., 1989). No other styles were significantly correlated. Individual defenses of Neurotic Denial, Omnipotence/Devaluation, Projective Identification, and Splitting all showed positive correlations with their respective defenses between the DSQ and DMRS (Bond et al., 1989). Overall, however, less than 25% of the items on the DSQ were significantly related to the DMRS defenses that they were supposedly assessing (Bond et al., 1989). Later research (Perry & Hoglend, 1998) using the ODF from the DSQ and ODF from the DMRS showed the two measures had only a small positive relation (r = .26). In sum, the DSQ and DMRS have been shown to have few significant relations to each other. Significant relations seem to be primarily at the immature level.

Similarly, few studies have examined the relation between the Defense-Q and other measures. MacGregor and Olson (2005) found that the overall measure of defensive healthiness from the Defense-Q, the Adaptive Defense Profile (ADP) Similarity Score, was negatively related to the two most maladaptive defense styles from the four-factor DSQ (i.e., Maladaptive & Image Distorting Defense Style) and positively related to the two most adaptive defense styles (Adaptive & Self Sacrificing Defense Styles). Similarly, MacGregor and Olson found that the Defense-Q ADP Similarity Score was positively related to the two most adaptive defense styles from the DMI (i.e., PRN & REV) and negatively related to one of the three maladaptive defense styles (i.e., TAO).

Few studies use both the DSQ and DMI concurrently (e.g., MacGregor & Olson, 2005), and the relation between the two measures is rarely examined. In one study on self-report defenses Mehlman and Slane (1994) investigated limited aspects of the two measures and demonstrated that DMI defense styles were not related to similar individual defenses on the DSQ. Davidson and MacGregor (1998) sum up the research for self-report defense measures in general stating that convergent validity is "almost nonexistent" (Davidson & MacGregor, 1998).

Not only is it important to understand how defense measures relate to each other, but it is also important to examine factors that might interfere with accurate defense assessment. An important critique of observer report measures for many constructs is potential bias of the observers. Researchers have noted a tendency for more attractive people to be rated as more healthy in many domains (Dion, Berscheid, & Walster, 1972; Eagly, Ashmore, Makhijani, & Longo, 1991; Jackson, Hunter, & Hodge, 1995). This has been proposed as a plausible alternative explanation for the relation between observer report defense measures and other indicators of adaptive behaviour (Davidson, MacGregor, Johnson, Woody, & Chaplin, 2004). To ensure that the observational defense coders in the present investigation were not being biased by the attractiveness of the participants, the scores of the observer report measures were compared to ratings of attractiveness for each participant. Significant relations in either the positive or negative direction might indicate bias on the part of the raters and provide support for an alternative explanation for previously found relations between observer report defenses and other indicators of adaptive behaviours.

Hypotheses

Because there is only minimal previous research investigating relations among defense measures, theoretical expectations will be used for the hypotheses in addition to the sparse previous research. It is hypothesized, primarily based on theory, that indicators of mature defense use on the Defense-Q and DSQ will be significantly positively correlated to indicators of mature defense use on other defense measures and significantly negatively correlated to indicators of immature defense use on other defense measures. Conversely, it is hypothesized that indicators of immature defense use on the Defense-Q and DSQ will be significantly positively correlated to indicators of immature defense use on other defense measures and significantly negatively correlated to indicators of mature defense use on other defense measures. No hypotheses are made regarding neurotic level defense styles.

With regard to individual defenses, there is limited evidence from Bond and colleagues (1989) that there is some overlap between individual defenses assessed by observer and self-report. However, numerous researchers indicate problems with self-reporting some defenses such as Denial and mature defenses in general (Besser, 2004; Brody et al., 2003; Cooper et al., 1991; Cramer 1998a; 1998b; Flett et al., 2005; Joiner et al., 2000; Kwon, 1999; Norem, 1998; Skodol & Perry, 1993), which may reduce the strength of the relation between the observer and self-report of these defenses. Regardless, it is hypothesized that individual defenses assessed by the Defense-Q will show significant positive correlations to the similarly named individual defenses assessed by the DSQ.

In terms of hypotheses for the attractiveness ratings, researchers (e.g., Davidson et al., 2004) have proposed that it is important to investigate whether or not characteristics such as physical attractiveness might provide an alternative explanation for previously found relations between observer report defenses and other indicators of adaptive behaviour. Previous research has demonstrated that a person's perceived attractiveness is positively related to perceived attributes such as job performance, parenting, intellectual competence, and psychological adjustment (Dion, et al., 1972; Eagly, et al., 1991; Jackson, et al., 1995). Although this finding is wide-ranging, it has also been shown to be most prevalent when there is a lack of other information available to the observer (Eagly et al., 1991). In the case of observationally rated defense measures, there is a large amount of information being considered for numerous defense mechanisms. It is therefore hypothesized that the Defense-Q Adaptive Defense Profile (ADP)

Similarity Score and the 25 individual defense scores will be not be significantly correlated to the general physical attractiveness scores. Similarly, the DMRS ODF and defense levels will not be significantly correlated to the general physical attractiveness scores of the participants.

Specifically, between the Defense-Q and DSQ (Analyses 1 & 2), I hypothesize:

1. Significant positive correlations between the scores on the mature index from the Defense-Q (ADP Similarity Score) and the scores on the mature indices from the DSQ (ODF & Mature Defense Style). Significant negative correlations between the scores on the mature index from the Defense-Q (ADP Similarity Score) and the scores on the immature index from the DSQ (Immature Defense Style).
2. Significant positive correlations between the scores on similarly named defenses on the Defense-Q and the DSQ (i.e., Acting Out, [Autistic] [9] Fantasy, Devaluation, Displacement, Dissociation, Humour, Idealization, Isolation, [Neurotic] Denial, Passive Aggression, Projection, [Pseudo]altruism, Rationalization, Reaction Formation, Splitting, Sublimation, & Undoing).

For the Defense-Q and DSQ compared to the DMRS and the DMI (Analysis 3), I hypothesize:

3a. Significant positive correlations for the scores on the mature index from the Defense-Q (ADP Similarity Score) as well as the scores on the mature indices from the DSQ (ODF & Mature Defense Style) when compared to the scores on the correspondingly mature indices of the DMRS (ODF & High Adaptive Level) and DMI (ODF, PRN & REV). Additionally, significant negative correlations for the scores on the mature index from the Defense-Q (ADP Similarity Score) as well as the scores on the mature indices from the DSQ (ODF & Mature Defense Style) when compared to the scores on the immature indices from the DMRS (Minor Image Distorting, Disavowal – including the Fantasy sublevel, Major Image Distorting, & Action defense levels) and DMI (TAS, TAO, & PRO).

3b. Significant negative correlations between the scores on the immature index from the DSQ (Immature Defense Style) and the scores on the mature indices of the DMRS (ODF & High Adaptive Level) and DMI (ODF, PRN, & REV).

[9] Square brackets are used to identify minor variations in similarly named defenses between the DSQ and Defense-Q.

Additionally, significant positive correlations between the scores on the immature index from the DSQ (Immature Defense Style) and the scores on the immature indices from the DMRS (Minor Image Distorting, Disavowal - including the Fantasy sublevel, Major Image Distorting, & Action defense levels) and the DMI (TAS, TAO, & PRO).

With regard to Defense-Q and DMRS scores compared to attractiveness (Analysis 4), I hypothesize:

4. No significant correlations between scores on the Defense-Q (ADP Similarity Score or on the 25 individual defenses) or scores on the DMRS (ODF or on the defensive levels) with the general physical attractiveness scores of the participants.

Method

Participants

A sample of 150 participants (107 females – 71.33%) was recruited from an Introductory Psychology class at the University of Saskatchewan. The participants' age in the sample ranged from 17 to 36 years (M = 19.60; SD = 2.52 years). All participants received partial course credit for participation.

Measures

Defense-Q. The Defense-Q is an observer based Q-sort measure that is used to assess the relative use of 25 defenses. The instrument has 25 different cards, each card corresponding to a different defense. Using a Q-sort methodology, the cards are sorted into seven piles ranging from most to least characteristic of the defense use of the person being assessed (see Appendix B for a Defense-Q scoring sheet). One defense mechanism is selected as most characteristic of the person, two are selected as quite characteristic, five as somewhat characteristic, nine as neither characteristic nor uncharacteristic, five as somewhat uncharacteristic, two as quite uncharacteristic, and one as most uncharacteristic (Davidson & MacGregor, 1996).

The Defense-Q was designed to produce an overall score of the adaptiveness of defense use and can be used with a wide variety of possible case material. This adaptiveness score is derived by comparing an individual's defense profile to a theoretically "ideal" defense profile, called the Adaptive Defense Profile (Block, 1978; MacGregor & Olson, 2005; McKeown & Thomas, 1988). The ADP can be seen in Figure 1. The ADP was constructed using the input of

clinical psychologists, psychodynamically trained graduate students, and undergraduate honours students chosen for their familiarity with defense theory (Davidson & MacGregor, 1996). Profiles from the clinicians and students were discussed as a group. When disagreements about the optimal placing of a defense in the ADP occurred, the slot closest to the mean placement of the clinicians and students was used to create a prototypical ADP (MacGregor, 2000). This prototypical ADP is largely similar to other hierarchical orderings of defenses (e.g., DSQ, DMRS) and has demonstrated validity across several previous studies (e.g., Davidson et al., 2004; MacGregor, 2000; MacGregor, Davidson, Barksdale, Black & MacLean, 2003; MacGregor, Davidson, Rowan, Barksdale, MacLean 2003; MacGregor & Olson, 2005). The comparison between an individual's defense profile and the ADP is indexed as a within-subject correlation computed across all 25 defenses and is called the ADP Similarity Score. The ADP Similarity Score ranges from -1 (perfectly dissimilar from the ideal defense profile) to +1 (perfectly similar to the ideal defense profile). The higher the ADP Similarity Score, the more adaptive the defense use of the individual. An example of a relatively adaptive defense profile (Participant 1, ADP Similarity Score = .73) and a relatively maladaptive defense profile (Participant 2, ADP Similarity Score = -.70) compared to the ADP can be seen in Figure 2. A score for the relative use of individual defense mechanisms can be obtained by summing the rank (e.g., 7 = Most characteristic defense of the participant, 6 = defense is quite characteristic etc.) given to the defense across all coders and dividing by the number of coders. This results in a score ranging from 1-7 (7 being most characteristic) that indicates how characteristic the defense is of the person being rated (MacGregor & Olson, 2005).

MacGregor and Olson (2005) report inter-rater reliability for individual Defense-Q defenses that ranged from .32 - .91, with a mean reliability of .69. Davidson and MacGregor (1996) report an inter-rater reliability of .69 for the overall defense profile. Evidence for the validity of the Defense-Q has been shown in numerous areas. In a sample of 667 community participants, ADP Similarity Scores have been shown to be related to lower self-reported depression, hostility, alcohol use, and binge drinking even after controlling for age, income, education, and sex of the participant (MacGregor & Olson, 2005). Defense-Q profiles as well as individual defenses were found to differentiate between mentally healthy and mentally unhealthy participants in a university sample (n = 236; mentally unhealthy group had at least 1 clinically elevated clinical scale on the PAI) and also in a community sample (n = 667; mentally unhealthy

patients self-reported a current mental health diagnosis; MacGregor & Olson, 2005). In both the community and university samples Humour, Intellectualization, Idealization, and Sublimation were more characteristic of mentally healthy participants while Acting Out, Psychotic Denial, and Regression were more characteristic of mentally unhealthy participants. ADP Similarity Scores have also been shown to be related to lower resting diastolic and systolic blood pressure (MacGregor, Davidson, Barksdale, et al., 2003) and lower physician health care costs (MacGregor, Davidson, Rowan, et al., 2003). Finally, patient profiles scored by independent raters have been shown to be positively correlated with profiles scored by the patient's treating therapist (Perry & Ianni, 1998)[10].

Defense Mechanism Rating Scale (DMRS). The DMRS is an observer-based measure that is used to assess 27 defense mechanisms. The DMRS was designed to be used on a 60 minute standard psychodynamic intake session (Perry & Henry, 2004; Perry & Kardos, 1995). The DMRS is currently in its fifth edition, with the most recent revision adding more adaptive defenses and modifying defense definitions to match consensus among researchers drafting the *DSM* defense definitions (Perry & Henry, 2004). The DMRS was originally scored using the "qualitative scoring method" but the most recent revision has added a "quantitative scoring method" (Perry & Kardos, 1995). In the original qualitative method, each of the individual defenses are rated on a three-point scale based on whether the participant definitely uses, probably uses, or definitely does not use the defense. Alternatively, the quantitative method is used to record the number of times each defense is used. Each defense is weighted according to its place in an overall hierarchy of defenses (Hoglend & Perry, 1998).

Perry (Perry & Henry, 2004) argues that the quantitative scoring is preferable to qualitative, therefore only quantitative scoring methods will be addressed here. To obtain scores for an individual defense, the number of times that defense was observed in the interview is divided by the total number of defenses observed in the interview. Similar to the individual defense score for the Defense-Q, this score represents the frequency this particular defense is used in comparison to the other defenses used by the person (Perry & Henry, 2004). In addition to the 27 individual defense ratings, the DMRS can yield a defense level score. The defense level corresponds to one of seven levels of defense in the DMRS (Perry & Henry, 2004). In addition to

[10] The interested reader is referred to Appendix C for a table of psychometric properties of the Defense-Q in this study.

the seven defense levels, the Disavowal level has a sublevel that consists of a single defense (Fantasy) that is at the same level of adaptiveness, but does not fit under the disavowal label (Perry & Henry, 2004). See Appendix D for a DMRS scoring sheet with defense levels outlined. To obtain a defense level score the individual defense scores of the defenses comprising the defense level are summed (e.g., sum the individual defense scores of Isolation, Intellectualization and Undoing to obtain the Obsessional Defense Level score; Perry & Henry, 2004). See Table 2 for defense hierarchy for the DMRS fifth edition. Alternatively, an Overall Defensive Functioning (ODF) score can be computed by summing the number of times each defense is used and then multiplying that score by the weight of the level to which it belongs. These scores are then summed and the total is divided by the total number of defenses observed in the interview. The ODF score is therefore an average level of adaptiveness of the defenses used (Perry & Henry, 2004).

Reliability of the DMRS has been somewhat lower than for that of the Defense-Q. Median inter-rater reliability for individual defenses has been reported at .36 (range .11 to .59) using six individual Baccalaureate level coders (Perry & Cooper, 1989; Perry & Henry, 2004; Perry & Kardos, 1995) and .41 (range .04 - .80) using three Master's level coders (Bond et al., 1989). A somewhat higher reliability of .57 (range .35 - .79) for individual defenses has been reported when three coders rate persons together and come to a "consensus" and this score is compared to another group of three coder's consensus code (Perry, 1990; Perry & Henry, 2004). Reliability for defense levels has been reported at .53 when coded by six individual Baccalaureate level coders (Perry & Cooper, 1989) and .57 when coded by three Master's level coders (Bond et al., 1989). Again, a somewhat higher reliability of .71 was reported when consensus coding was used (Perry & Cooper, 1989; Perry & Henry, 2004). Test-retest stability of defenses has been shown to be .75 for the ODF using qualitative scoring over 4 weeks and .48 for the ODF using quantitative scoring over 5 weeks (Perry & Henry, 2004). Several studies have demonstrated good validity for the DMRS as was outlined in the introduction[11].

Defense Style Questionnaire (DSQ). The DSQ has undergone numerous revisions since its original inception in 1983. To follow the development of the measure the interested reader is directed to the work of Bond (Bond et al., 1983; 1989; 1995; Bond & Wesley, 1996) and Andrews (Andrews et al., 1989; Andrews, Singh, & Bond, 1993) or to a recent summary by

[11] The interested reader is referred to Appendix E for a table of psychometric properties of the DMRS in this study.

Cramer (2006). Also, for more information on the versions used in the research cited in this paper, see Appendix A. The DSQ is a 72-item questionnaire designed to assess three separate defense styles (Immature, Neurotic, & Mature), 20 defense mechanisms and provide one Overall Defensive Function (ODF) score (Andrews, et al., 1989; Bond & Perry, 2004; Perry & Hoglend, 1998). Participants respond to the 72 items on a Likert scale ranging from 1 (*Strongly Disagree*) to 9 (*Strongly Agree*).

Each item for the DSQ corresponds to an individual defense mechanism. Scores for individual defenses are obtained by summing the scores from the items for each defense. To obtain a score for a defense style, the scores for each of the individual defenses in that style are summed (Andrews et al., 1989). More recently researchers have suggested computing an Overall Defensive Functioning (ODF) score. ODF for the three-factor DSQ has been calculated a number of different ways, one of which is by multiplying the score of each individual defense by a predetermined weight (1-7) assigned by a panel of expert ratings of the adaptiveness of the definition of the defense. These numbers are then summed and the result is divided by the sum total of all 72 items and results in a score between 1 and 7 that indicates overall adaptiveness of defensive functioning (Trijsburg, van t' Spijker, Van, Hesselink, & Duivenvoorden, 2000). It is Trijsburg and colleagues' (2000) ODF scoring method based on the definition of the defenses that was used in the present investigation.

Given the self-report nature of the DSQ, the problem of inter-rater reliability is avoided. More important for self-report, however, is the extent to which scores are stable over time. The DSQ has been found to have satisfactory test-retest reliability over 6 weeks with the three factor structure (range = .76 - .86; Muris & Merckelbach, 1994) and over 6 months with the four factor structure (range = .68 - .73; Bond et al., 1989). Several studies have demonstrated good validity for the DSQ as was outlined in the introduction[12].

Defense Mechanisms Inventory (DMI). The DMI is a self-report measure that assesses five separate defense styles: Principalization (PRN), Reversal (REV), Turning Against the Self (TAS), Turning Against the Object (TAO), and Projection (PRO; Ihilevich & Gleser, 1986). Of these defense styles, PRN is typically considered the most adaptive and PRO is typically considered the least adaptive (Ihilevich & Gleser, 1986). The measure involves reading 10 vignettes, each of which is followed by four questions with five possible answers (corresponding

[12] The interested reader is referred to Appendix F for a table of psychometric properties of the DSQ in this study.

to the 5 defense styles) for each question. The four questions refer to what the participants' actual reaction would be if the situation described just happened to them, what they would want to do in fantasy, what thoughts might occur to them, and how they would feel. For each of the four questions, participants choose one answer that is most like what their response would be and one answer that is least like what their response would be. The DMI is written in both a male and female version with minor wording differences to adjust for the different sexes.

To obtain defense level scores, responses for each of the four sections (actual reaction, thoughts, fantasies, & feelings) are summed to create situational scores for each defense style. Total scores for each defense style are then obtained by summing the situational scores. Researchers have recently proposed combining the DMI scales to provide an Overall Defensive Functioning (ODF) score. One such overall score is obtained by summing the two most adaptive defense styles (PRN & REV) and then subtracting the sum of the three most maladaptive styles (TAS, TAO, & PRO; Kurtz & Schremp, in press).

Reliability of the DMI has been extensively reviewed by Cramer (1988; 1991). She found test-retest reliability (1 – 8 weeks) and inter-item reliability to be approximately .78 and .78 respectively over six independent investigations (Cramer, 1988; 1991). TAO was consistently the most reliable defense style (range = .70 - .93) while PRO was the least reliable defense style (range = .48 - .85). Depending on the study, the other defense styles fall variably in-between. Findings for convergent validity for the defenses have been mixed. REV has consistently shown high convergent validity. For example, REV has shown expected relations with Denial, Avoidance, and Repression (Cramer, 1988; 1991). PRN, however, does not relate in a theoretically consistent manner to criterion measures. For example, even though PRN is theoretically the most adaptive defense style, it has shown a positive relation to measures of less adaptive defenses such as Denial, Regression and Repression. The other three styles tend to have mixed support for their validity (Cramer, 1988; 1991)[13].

Attractiveness Rating Scale. The Attractiveness Rating Scale was developed in Dr. Michael MacGregor's research laboratory for a related study. No previous studies have been published using the Attractiveness Rating Scale. Items were selected by examining the literature (e.g., Meerlink, Garbin, & Leger, 1990; Paunonen, Ewan, Earthy, Lefave, & Goldberg, 1999) to identify variables related to the attractiveness of participants. The scale consists of 39 items rated

[13] The interested reader is referred to Appendix G for a table of psychometric properties of the DMI in this study.

on Likert scales by trained coders. The Attractiveness Rating Scale contains items related to physical features (e.g., skin complexion), clothing (e.g., neatness) and traits (e.g., friendliness) of the participant. Additionally, the scale contains a 7-point Likert scale item on the general overall physical attractiveness of the participant (higher scores = more attractive). Only this overall item was used for the present investigation. An averaged score between the two coders was used in the final analyses and only participants where both coders rated the participant were included in this analysis (n = 111). The correlation between the independent coders on this overall attractiveness item was r = .43, p < .001.

Procedure

Participants completed the DSQ and the DMI and underwent a video-recorded Expanded Structured Interview (ESI). The ESI is a 15-minute semi-structured interview designed to be interpersonally stressful. The ESI asks questions related to emotional responses, coping styles, and behaviours across a number of commonly experienced stressors (Hall, Davidson, MacGregor, & MacLean, 1998). The questions deal with social interactions at school and work, expression of emotions, competitiveness, and general interactions with others. The interview has been used as the basis for assessing defense use and defensiveness in several other studies (e.g., Davidson & MacGregor, 1996, MacGregor, Davidson, Barksdale, et al., 2003; MacGregor, Davidson, Rowan et al., 2003; MacGregor & Olson, 2005). All participants received the same questions delivered in the same order and in the same standardized manner (e.g., pace of interview, which words were stressed, when/if to cut people off, etc.). The video-recorded ESIs provided a sample of responses and behaviours from which defenses were rated using the Defense-Q and the DMRS and the images from which the attractiveness ratings were made. All interviews were independently watched and rated by the trained coders.

ESI interviewer training. All ESIs were conducted by interviewers trained in ESI administration. The interviewers participated in approximately 12 hours of training. First, interviewers reviewed a copy of the ESI training manual (Hall et al., 1998). After reviewing the manual, interviewers watched an experienced interviewer conduct a live practice ESI interview with a volunteer. Following this live interview, interviewers watched several video-recorded ESI interviews to ensure they were familiar with all aspects of the interview as well as some typical responses by participants. Next, interviewers were taught interviewing skills such as which words required voice emphasis, pacing speed at various points in the interview, how to manage

interview duration, and when to be more empathic or businesslike. Interviewers then practiced their interviewing skills with each other while experienced interviewers monitored and corrected them. After interviewers had achieved a sufficient level of standardization they were asked to video-record a practice interview with someone they did not know well. These video-recorded interviews were watched and discussed with an experienced coder. After achieving acceptable interviewing skills, interviewers then started data collection. This procedure is similar to training described in previous research (e.g., Davidson & MacGregor, 1996; MacGregor & Olson, 2005).

Defense-Q coder training. All coders initially participated in approximately 20 hours of training. Prior to training on the Defense-Q, coders were introduced to the theory of defense mechanisms. Coders subsequently reviewed the Defense-Q technical manual, which discusses how to rate the 25 defenses assessed by the Defense-Q (MacGregor & Davidson, 1998). Next, each defense included in the Defense-Q was reviewed with the coders in group training. This review included a discussion of the definition of each defense, classical examples of its manifestation, examples of its use in the ESI interview, and typical evidence that would indicate its presence or absence. Subsequently, video-recorded interviews were watched in group training where experienced coders discussed how they would code the participant for defenses using the Defense-Q. Finally, coders independently coded practice video-recorded interviews using the Defense-Q. These interviews were then watched as a group with experienced coders and defense ratings were discussed. Once a sufficient level of standardization was achieved, data collection began. During data collection weekly "coder reliability" meetings were conducted to ensure standardization was maintained and to prevent "coder drift". Three Defense-Q coders completed training and participated in data collection. Prior to participating in data collection for Study 1, all three Defense-Q coders coded approximately 200 ESI interviews for a related study. This procedure is similar to training described in previous research (e.g., Davidson & MacGregor, 1996; MacGregor & Olson, 2005).

DMRS coder training. The coder initially participated in approximately 20 hours of DMRS training. Prior to training on the DMRS, the coder completed the above mentioned training for the Defense-Q and coded approximately 200 ESI interviews using the Defense-Q for a related study. The DMRS coder then read the DMRS fifth edition technical manual, which discussed how to rate each of the 27 defenses assessed by the DMRS. As was done for Defense-Q coding, the DMRS manual was then reviewed in training sessions and classical examples as

well as examples of its use in ESI interviews were discussed. Practice interviews were then watched with the trainer until a sufficient level of coder reliability was achieved. During data collection weekly "coder reliability" meetings were conducted to ensure standardization was maintained and to prevent "coder drift". The DMRS coder was a separate coder from the Defense-Q coder and he did not code any of the Defense-Q ratings for this study.

Attractiveness Rating Scale coder training. The coders initially participated in approximately 10 hours of training. This training consisted of watching several ESI interviews with an expert coder while discussing the various items of the scale. Once coders reached a sufficient level of reliability between each other and with the expert coder, data collection began. During data collection weekly coder reliability meetings were conducted to ensure standardization and to prevent "coder drift". Two coders completed training and independently rated participants' attractiveness for this study. These Attractiveness Rating Scale coders were separate from the Defense-Q and DMRS coders and were not trained in observational defense mechanism assessment.

Study 1 Results

Analyses

Pearson *r* analyses were used to determine the relation between various measures of defenses (Leech, Barrett, & Morgan, 2005). For broad level comparisons, the Defense-Q ADP Similarity Score, as well as the defense styles (Immature, Neurotic, & Mature) and the ODF from the DSQ were used. These broad levels of defense assessment from the Defense-Q and DSQ were compared to each other as well as to the seven defense levels (High Adaptive, Obsessional, Other Neurotic, Minor Image Distorting, Disavowal – including the Fantasy sublevel, Major Image Distorting, & Action Defense Levels) and ODF from the DMRS, and the five defense styles (PRN, REV, TAS, TAO, & PRO) and the ODF from the DMI. Additionally, the individual defense mechanisms assessed by both the Defense-Q and the DSQ (Acting Out, [Autistic] Fantasy, Devaluation, Displacement, Dissociation, Humour, Idealization, Isolation, [Neurotic] Denial, Passive Aggression, Projection, [Pseudo]altruism, Rationalization, Reaction Formation, Splitting, Sublimation, & Undoing) were compared to each other.

Correlation assumptions. Pearson *r* analyses are based on the assumption that the variables are related in a linear (as opposed to curvilinear) manner and that they are normally

distributed (Leech, et al., 2005). Normality is predicated on the assumption that the variables are not significantly skewed or kurtotic and that there are no univariate outliers.

Pairwise versus listwise. Correlation analyses can be run in either a pairwise or a listwise fashion. In a pairwise analysis a participant only has to have a score in each of the two variables in an individual analysis. In a listwise analysis, however, a participant must have a score in every variable in the analysis to be included in any analysis (Howell, 2002). Although the listwise analysis results in a lower number of participants being available for some analyses, it has the benefit of ensuring that each analysis contained all of the same participants. As such, the correlations were run in a listwise fashion requiring that participants have a score for every defense item to be included in any comparison of defense scores.

Error rate correction. Although individual analyses are set to have a specific acceptable rate of error (error rate per comparison; e.g., willing to accept that 1 in 20 times the analysis might incorrectly indicate a significant relation between variables), increasing the number of analyses increases the likelihood of having at least one spurious finding (Howell, 2002). Adjusting the error rate to account for the number of analyses can keep the rate of error steady, but comes at the cost of decreasing the likelihood of detecting actual differences (Howell, 2002). In the present study no adjustment was made on the error rates to correct for the number of analyses. It was decided that it was more important to detect actual relations in the present study than it was to control the familywise error. Previous research in the area (e.g., Flannery & Perry, 1990; Perry, 1990; 1996) opted for not correcting for the number of analyses as well as including p values up to .10 to maximize the ability to detect relations for generating future hypotheses. Striking a balance, it was decided to look only at relations of $p < .05$ for the present study, but not to correct for the number of analyses. This should be taken into account when considering the results.

Testing Correlation Assumptions for all Analyses

I will begin by addressing the assumption of linearity. Next, I will address the assumption of normality, starting with skewness, then kurtosis, and finally univariate outliers. Assumptions were tested for all defense variables prior to running any of the correlation analyses. Bivariate plots for all correlations were examined to test the assumption of linearity. Evidence of a curvilinear relation on the plots would indicate the assumption was not met (Leech et al., 2005). No plots evidenced a curvilinear relation, indicating that linearity can be assumed.

Screening for skewness and kurtosis was conducted by dividing the skewness or kurtosis score by the corresponding standard error score. Values with an absolute score higher than 1.96 were considered significantly skewed or kurtotic (Field, 2005). Only variables that violated an assumption are discussed and all variables not mentioned were within the acceptable range. For the DSQ, seven of the individual defenses were skewed (Altruism, Denial, Displacement, Dissociation, Humour, Projection, & Undoing) and two were kurtotic (Fantasy & Rationalization). For the Defense-Q, five of the individual defenses were skewed (Acting Out, Idealization, Passive Aggression, Projection, & Reaction Formation) and six were kurtotic (Acting Out, Displacement, Fantasy, Idealization, Isolation, & Passive Aggression). All seven of the DMRS defense levels (High Adaptive, Obsessional, Other Neurotic, Minor Image Distorting, Disavowal, Major Image Distorting, & Action) and the Fantasy sublevel were skewed and five DMRS defense levels (Other Neurotic, Minor Image Distorting, Disavowal, Major Image Distorting, & Action) and the Fantasy sublevel were kurtotic. Finally, none of the DMI variables were skewed and only TAS was kurtotic.

Removing univariate outliers can sometimes address problems with skewness and kurtosis (Field, 2005). Therefore, the skewness and kurtosis aspect of the normality assumption was re-evaluated after addressing the univariate outlier aspect of the normality assumption. Screening for outliers was conducted on all variables using procedures outlined in Tabachnick and Fidell (2001), where *z*-scores greater than $z = 3.29$ were considered outliers. The number of participants who had scores that were univariate outliers were as follows: Four on the DSQ (Denial x 2, Devaluation, & Projection), seven on the Defense-Q (Acting Out x 2, Displacement, Fantasy, Idealization, Splitting, & Sublimation), 12 on the DMRS (Action x 2, Disavowal x 2, Fantasy sublevel x 2, Major Image Distorting x 2, Minor Image Distorting, & Other Neurotic x 3), and one on the DMI (TAS). In total, 21 of the 150 participants were outliers on at least one variable and three of those participants were outliers on two of the variables. All 21 participants who violated the normality assumption with a univariate outlier score were removed from further analyses, leaving 129 participants for the analyses.

Deleting the participants with univariate outliers corrected very few of the problems with skewness and kurtosis. Specifically, all of the seven skewed (Altruism, Denial, Displacement, Dissociation, Humour, Projection, & Undoing) and two kurtotic (Fantasy & Rationalization) variables on the DSQ remained skewed or kurtotic after deleting univariate outliers. For the

Defense-Q, skewness and kurtosis were corrected on Idealization while kurtosis (but not skewness) was corrected for Acting Out. Four Defense-Q variables remained skewed (Acting Out, Passive Aggression, Projection, & Reaction Formation) and four remained kurtotic (Displacement, Fantasy, Isolation, & Passive Aggression). In terms of DMRS variables, all seven of the defense levels (High Adaptive, Obsessional, Other Neurotic, Minor Image Distorting, Disavowal, Major Image Distorting, & Action) and the Fantasy sublevel remained skewed while three DMRS defense levels (Disavowal, Major Image Distorting, & Action) and the Fantasy sublevel remained kurtotic and two of the defense levels (Other Neurotic & Minor Image Distorting) were no longer kurtotic. Finally, removing the univariate outliers corrected the kurtosis for TAS, leaving no DMI variables skewed or kurtotic.

Although the outlier aspect of the normality assumption was now met, several of the variables remained skewed or kurtotic. In an attempt to address this assumption violation, several transformations of the data were attempted according to procedures outlined by Field (2005). Starting with the 17 DSQ individual defenses eight were skewed and two were kurtotic after removing outliers and prior to performing any transformations. Square root (8 skewed, 6 kurtotic), log 10 (15 skewed, 8 kurtotic) and inverse (17 skewed, 15 kurtotic) transformations failed to improve the normality of the variables. None of the three DSQ defense styles or ODF were skewed or kurtotic after removing outliers and two of the transformations, log 10 (2 skewed, 1 kurtotic) and inverse (3 skewed, 3 kurtotic), introduced problems with the normality assumption for these variables. Similarly, of the 17 Defense-Q individual defenses, five were skewed and three were kurtotic after removing outliers and prior to transformations. Square root (7 skewed, 4 kurtotic), log 10 (9 skewed, 4 kurtotic) and inverse (13 skewed, 7 kurtotic) transformations failed to improve the normality of the variables. The Defense-Q ADP Similarity Score was skewed after removing outliers and remained skewed after square root, log 10, and inverse transformations. The log 10 and inverse transformations, however, also made the ADP Similarity Score kurtotic. Next, of the seven DMRS scores, the fantasy sublevel, and the DMRS ODF, eight of the scores were skewed and four were kurtotic after removing outliers. Square root (8 skewed, 4 kurtotic), log 10 (8 skewed, 8 kurtotic), and inverse (9 skewed, 7 kurtotic) transformations failed to improve the normality of the variables. Finally, none of the five defense styles or ODF score on the DMI were skewed or kurtotic after removing the outliers. Square root (2 skewed, 1 kurtotic), log 10 (3 skewed, 2 kurtotic), and inverse (6 skewed, 5 kurtotic)

transformations all produced more violations of normality. In sum, although some of the variables were skewed or kurtotic, each of the transformations intended to correct the distribution resulted in a less normal distribution than the untransformed data.

Although Pearson *r* analyses assume normal distributions, several transformations of the data were unsuccessful at correcting the distribution. This tendency of transformations to correct one variable resulting in less normally distributed overall data has been noted as a complication of transformation in the literature (Dunlap, Chen, & Greer, 1994). Although some authors argue that Pearson *r* is robust to violations of normality (including combinations of skewness and kurtosis; e.g., Havlicek & Peterson, 1977; Norris & Aroian, 2004), others have noted that transforming data to correct skewness and kurtosis can increase power and correlation values compared to untransformed data with violations of the normality assumption (Dunlap, Burke, & Greer, 1995). Additionally, from an interpretation standpoint, transforming data often complicates theoretical or logical interpretation of the data and can limit the ability to compare results to other studies in the literature that were not similarly transformed (Dunlap et al., 1995; 1994; Games, 1983). As such, I proceeded with nontransformed variables because the Pearson *r* analysis appears to be reasonably robust to the violations of normality, the nontransformed variables are the most normally distributed of the options, and because the nontransformed variables will allow for the most meaningful interpretations. This will result in more meaningful and conservative testing of relations (Dunlap et al., 1995; 1994; Games, 1983).

Analysis 1: Defense-Q with DSQ (ODF & Defense Styles)

ADP Similarity Scores from the Defense-Q were positively related to the ODF, $r = .37$ (129), $p < .001$, and the Mature Defense Style, $r = .23$ (129), $p = .008$, of the DSQ, and negatively related to the Immature, $r = -.26$ (129), $p = .003$, Defense Styles of the DSQ. Neurotic Defense Style on the DSQ and the ADP Similarity Score on the Defense-Q were not correlated at the $p < .05$ level. See Table 3 for more information.

Analysis 2: Defense-Q with DSQ (Individual Defenses)

Four of the 17 pairs of defenses were significantly correlated. Specifically, the defenses Acting Out, $r = .33$ (129), $p < .001$, Rationalization $r = .22$ (129), $p = .012$, Reaction Formation, $r = .30$ (129), $p = .001$, and Sublimation, $r = .20$ (129), $p = .023$, were significantly correlated. All remaining pairs of defenses were not correlated at the $p < .05$ level. See Table 4 for more information.

Analysis 3: Defense-Q and DSQ with DMRS and DMI

ADP Similarity Scores from the Defense-Q were positively related to the ODF, $r = .24$ (129), $p = .006$, and the High Adaptive Level, $r = .26$ (129), $p = .003$, of the DMRS and negatively related to the Fantasy sublevel, $r = -.21$ (129), $p = .018$, and the Action Defense Level, $r = -.25$ (129), $p = .005$, of the DMRS. ADP Similarity Scores from the Defense-Q were not significantly related to the ODF or any of the five defense styles from the DMI. Additionally, of the 18 hypothesized relations between the DSQ and DMI, 15 were significant in the hypothesized direction with only the three relations with TAS not being significant. However, neither the ODF nor any of the three defense styles from the DSQ were significantly related to the ODF, the seven defense levels, or the fantasy sublevel from the DMRS. See Table 5 for more information.

Analysis 4: Defense-Q and DMRS Scores with Attractiveness

For the Defense-Q none of the 25 individual defense mechanisms or the ADP Similarity Score were significantly related to the general physical attractiveness item from the Attractiveness Rating Scale. See Table 6 for more information. Similarly, neither the defensive levels, sublevel, nor the ODF from the DMRS were significantly related to the general physical attractiveness item from the Attractiveness Rating Scale. See Table 7 for more information.

Study 1 Discussion

As was mentioned above, I will briefly discuss the results from Study 1 before moving on to presenting Study 2. Additional discussion from Study 1 results will be addressed in the General Discussion.

Hypotheses 1 and 2: Defense-Q with DSQ

ODF and defense styles. The results from the analysis 1 in Study 1 support the first hypothesis, which was that the mature index from the Defense-Q would be significantly positively related to the mature indices from the DSQ and negatively related to the immature index from the DSQ. This hypothesis was fully supported. This support suggests that the overall level of defensive functioning from the Defense-Q (the ADP Similarity Score) is related in a theoretically consistent manner to the broad level (both ODF and defensive levels) of defensive functioning from the DSQ. Using the standards from Cohen (1992)[14], the effect for the relation

[14] All references to correlation size in this document refer to Cohen's guidelines for effect size for correlations: Small (.10 - .29), Medium (.30 - .49) and Large (.50 and up)

to the Defense-Q ADP Similarity Score was small for the Mature and Immature defense styles and medium for the DSQ ODF. This pattern of effect sizes indicates that the effect size increases within this sample as the level of analysis broadens (i.e., as it moves from more specific to more global level of defensive functioning).

In comparison to previous research, the relation between the Defense-Q and DSQ is somewhat higher than previous results comparing observer and self-report measures. Perry and Hoglend (1998) found only a small relation (r = .26) between the DSQ and scores from the DMRS coders, compared to the present findings of a medium relation (r = .37). Although Perry and Hoglend's work was using a previous version of the DMRS, these results suggest that the overall score of adaptiveness for the Defense-Q is at least as strongly related to the DSQ as is the DMRS. Previous research comparing the Defense-Q to the DSQ was limited to a comparison of the Defense-Q ADP Similarity Score to the four-factor structure of the DSQ (MacGregor & Olson, 2005). The results of the present study using the three-factor DSQ parallel the findings of MacGregor and Olson using the four-factor DSQ. Combined, this adds convergent validity to the Defense-Q as a measure of general defensive functioning and suggests that the Defense-Q might relate to the DSQ in a similar manner to how the DMRS relates to the DSQ.

Individual defense mechanisms. Having examined how the Defense-Q and DSQ compare on an overall defensive level, it is important to examine how they compare to each other on a more specific individual defense mechanism level. Hypothesis 2 was that the 17 similarly named defense mechanisms shared between the Defense-Q and DSQ would be significantly positively correlated between the measures. Acting Out and Reaction Formation from the Defense-Q both had medium significant correlations with their DSQ counterparts, while Rationalization and Sublimation had small significant correlations between the measures. The remaining 13 defenses demonstrated no significant correlation between similarly names defenses between the Defense-Q and DSQ. In general, hypothesis 2 was not well supported. This pattern of relatively little overlap at the individual defense level is consistent with what might be expected if the results from analysis 1 are extrapolated. In analysis 1, the broadest level of DSQ defenses demonstrated a medium correlation, the middle level demonstrated small correlations and now in analysis 2 the majority of defenses at the individual level demonstrated no significant relation.

Although there was relatively little overlap between similarly named individual defenses between the Defense-Q and DSQ, this is generally consistent with the previous literature on

defense mechanism measures. In 1989, Bond and colleagues found that only 20 of the DSQ individual items correlated with the similarly named defense on the DMRS and when those items were combined into individual defense scores, only four DSQ defenses (Neurotic Denial, Splitting, Projective Identification, & Omnipotence/Devaluation) were significantly correlated with the similarly named DMRS defenses.

Summary of Defense-Q and DSQ relations. One explanation for a limited overlap between the Defense-Q and the DSQ in this sample is that the DSQ was not completed at the same time as the remaining defense measures from Study 1. The DMI was filled out the same day that the participants were interviewed (the interview was the basis for the Defense-Q and DMRS coding), whereas the DSQ was filled out separately. All measures were completed during the same 8-month university course, but there may have been a few months between the completion of the DSQ and the interview in some cases. Although defenses are arguably stable parts of personality, life circumstances, mood, or gradual changes from maturity in this developing sample may have somewhat reduced the strength of the relations. It is unlikely that there would be substantial change, however, given the satisfactory test-retest reliability of the DSQ over 6 weeks and 6 months (Bond et al., 1989; Muris & Merckelbach, 1994).

A second explanation for the decrease in the effect size of the relationship as we move from the overall level down to the individual defense level is the reliability of the scores. This applies not only to this sample in particular, but also generally to defense measures in general. Generally, previous research on the DMRS (Perry & Henry, 2004) indicates that reliability of scores decreases as the level of the defensive functioning becomes more specific (i.e., moves from global functioning to individual defense level). Moreover, other authors (Perry & Cooper, 1986) have noted that "lower reliability tends to wash out potential findings" (p. 887). As was mentioned previously, although observer report measures avoid the problem of self-report of unconscious material, they have the added difficulty of lower reliability, which often obscures potential relations[15].

Looking at more global explanations for this pattern of results, it may be that observer report measures assess different aspects of defenses than self-report measures. Authors (e.g., Kwon, 2000) have indicated that although observer report has the benefit of assessing an

[15] The interested reader is referred to Appendix H for a review of the reliability of the Defense-Q defenses and Appendix I for a review of the internal consistency of the DSQ ODF, styles and defenses in this sample.

unconscious aspect of a defense, self-report can have the benefit of accessing internal experiences that may be indicative of a defense. For example, observable aspects of defenses like Undoing (e.g., repetitive stroking of one's beard when anxious about giving a presentation) may be more easily assessed by observer report measures, whereas self-report measures of Undoing might be primarily assessing more internal aspects of Undoing (e.g., feeling compelled to engage in a ritual to reduce anxiety). Although both of these examples are indicative of the use of the defense mechanism Undoing, it may be that some persons engage more in either observable or internal aspects of the defense, thus accounting for some of the differences between scores on the observer and self-report measures. This possibility is rarely discussed in the literature and warrants further investigation.

This point relates to a common criticism of self-report (i.e., that it is purported to assess unconscious processes through conscious reporting), but also highlights the limitation of observer report measures relying primarily on observable behaviours without immediate access to the internal mental processes that might be tapped by self-report. Similar arguments for different aspects of a defense being assessed between projective and observer report measures have been made by Cooper and colleagues (1991) and other authors (e.g., Bronnec et al., 2005). These authors, in addition to other authors (Besser, 2004; Flett, Vredenburg, & Krames, 2005), have noted differences of defense assessment for informant versus self-report, which may also be indicative of differences between observable and internal phenomena. This difference in what aspect of a defense the measure most accurately assesses both highlights the strengths and limitations of the assessment methods as well as the previously mentioned recommendation (Besser, 2004; Bond et al., 1989; Davidson & MacGregor, 1998; Offer et al., 2000) that multiple methods of assessing defenses be used to achieve the most accurate representation of a persons' defensive processes.

A final explanation for the general lack of relation between similarly named defenses on the DSQ and Defense-Q requires an examination of the conceptualizations of the defenses between measures. For example, two of the defense mechanisms with very low *r* values between the Defense-Q and the DSQ are Passive Aggression ($r = -.02$) and Devaluation ($r = .03$). Two of the three items on the DSQ Devaluation scale are items that assess devaluation of the self, which is captured under the defense Turning Against the Self (and specifically *not* coded under Devaluation) on the Defense-Q. Similarly, Passive Aggression is more broadly defined on

measures like the DSQ and DMRS and includes aspects of Turning Against the Self as well. Differences in conceptualization of defenses have been noted by other researchers (Bond et al., 1989; Busch et al., 1995) as complicating factors in making comparisons between observer and self-report measures of defenses. As such, it will be important to address conceptualization differences in similarly named defenses in future studies.

Hypotheses 3a and 3b: Defense-Q and DSQ with the DMRS and DMI

Defense-Q with the DMRS and DMI. Hypotheses 3a and 3b generally propose that among the overall and defense level indices of the Defense-Q, DSQ, DMRS, and DMI, indices of mature defense use will be significantly positively correlated to indices of mature defense use and significantly negatively related to indices of immature defense use. Conversely, indices of immature defense use will be significantly positively correlated to indices of immature defense use and significantly negatively related to indices of mature defense use. These hypotheses were examined in analysis 3, which indicated that the observer report Defense-Q is related in a theoretically consistent manner to the other observer report measure (DMRS) on the ODF level as well as at the most adaptive and maladaptive defensive levels. This is similar to the pattern of results from analysis 1, where on the broad ODF and the polar extreme scores of the self-report DSQ were significantly related to the Defense-Q ADP Similarity Score. Additionally, the Defense-Q ADP Similarity Score demonstrated a small relation to the Fantasy sublevel of the Disavowal Defense Level.

Although the ADP Similarity Score from the Defense-Q was related to very few of the defensive levels of the DMRS, this is somewhat consistent with the literature on how other defense measures relate to the DMRS. In 1989, Bond and colleagues noted that the defense levels from the DSQ demonstrated small to medium correlations with only the Action and Disavowal levels of defense from the DMRS. In the present study we see the Defense-Q ADP Similarity Score demonstrated small correlations with the Action Defense Level and the Fantasy sublevel of Disavowal, and to the High Adaptive level and the ODF as well. The High Adaptive Level and ODF were not used in the Bond and colleagues' (1989) study as it used a previous version of the DMRS before these levels were developed. The relation between these two observer report measures is similar to both the results from the earlier analyses in this study as well as with previous literature comparing defense mechanism assessment measures. The polar extremes of mature and immature generally demonstrate theoretically consistent relations among

measures whereas the indices in the mid-range of maturity are more ambiguous. In the case of the present study, it appears that the overall index of defensive functioning from the Defense-Q (the ADP Similarity Score) is related to the extremes of the DMRS, but the mid-range defensive levels of the DMRS are not differentiated clearly enough on the maturity scale to evidence a theoretically consistent relation to the overall Defense-Q score.

Although research has generally not found consistent relations based on maturity of the mid-range defenses, some other possible explanations for the lack of relations for these DMRS levels in the present study are possible. First, only a single coder completed the coding using the DMRS. It is generally recommended that multiple coders independently code the data set (Davidson & MacGregor, 1998) and evidence has shown that increasing the number of coders increases the reliability as well as the strength of the correlations to other measures. This benefit for increasing the number of coders has been demonstrated on numerous observer report measures, including Vaillant's measure (Vaillant, 1995, p. 395), Perry's DMRS (Perry & Cooper, 1989; Perry & Henry, 2004) as well as on MacGregor's Defense-Q (Davidson & MacGregor, 1996; MacGregor & Olson, 2005). It is possible that had the additional coders not dropped out during training or data collection, more theoretically consistent relations in these mid-range defense levels may have been evidenced. The second possible reason for the absence of the expected relations is that the DMRS is designed to be used with a 60-minute psychodynamic interview. The 15-minute ESI is substantially shorter than any other interviews assessed by the DMRS in the published literature. The ability to assess defenses in relatively short samples of behaviour is one of the advantages of the Defense-Q over the DMRS.

Finally, although theoretically consistent relations were found at the extremes between the two observer report measures, there were no significant relations between the observer report Defense-Q and the self-report DMI. As was mentioned above, it is possible that this absence of theoretically hypothesized relations is related to the observer report and self-report measures assessing different aspects of defensive functioning. However, this does not account for the relations between the Defense-Q and DSQ that were evidenced in analysis 1. An examination of the method of assessing the defenses in the self-report measures may provide an answer. The DSQ utilizes statements that are intended to assess both internal and external derivatives of unconscious defense mechanism. For example, the item "Hard work makes me feel better" assesses a derivative on the internal experience of Sublimation, whereas the item "I'm often told

I don't show my feelings" assesses external cues of Isolation. The DMI on the other hand, uses 10 stories that are intended to illicit defensive reactions (e.g., imagining you were just splashed by a car or told you were not allowed to go out for the evening). While the two self-report measures share the same modality of assessment, it may be that the inclusion of some external aspects of defense assessment in the DSQ (i.e., using feedback from others to gather information about defensive functioning) increases the similarity of this measure to the observer report Defense-Q. Moreover, previous research (i.e., MacGregor & Olson, 2005) demonstrated positive relations between the Defense-Q ADP Similarity score and PRN and REV as well as negative relations between the ADP Similarity Score and TAO. Additional research is needed to understand this inconsistent pattern of relations between the Defense-Q and DMI.

DSQ with the DMRS and DMI. While the observer report Defense-Q was related to the other observer report measure but not the self-report, the opposite is true of the self-report DSQ. Fifteen of the 18 hypothesized relations between the self-report DSQ and DMI were significant in the hypothesized direction. Similar to the previous results, all of the nonsignificant relations were at the middle (and therefore ambiguous) level of adaptiveness and all of the correlations were small to moderate in effect size.

Although the DSQ and DMRS did not relate well in this study, this is again not inconsistent with the previous literature. Bond (2004) notes that previous research (Bond et al., 1989) showed that the DMRS and DSQ related well at the extremes but not in the middle, but after the DMRS was restructured into its present seven level form, there was even more divergence between the scales (i.e., in Perry & Hoglend, 1998). Moreover, the overlap they did find was using a DSQ ODF score calculated by simply increasingly weighting items from defensive levels as the maturity of the level increased (Perry & Hoglend, 1998). This is a much more simplistic method of calculating the ODF than was used by other researchers (e.g., Trijsburg, et al., 2000) and in the present study. With the restructuring of the DMRS and the different method of calculating the DSQ ODF, it is possible the DSQ and DMRS are no longer related in the manner they have been found to be related in previous literature.

In addition to the above reasons from the literature, several other explanations are possible for why the DSQ was related in a theoretically consistent manner to the self-report DMI but not to the observer report DMRS. One explanation is that the DMRS had only a single coder in the present study. As was mentioned above, increasing the number of coders has been

demonstrated to increase the relations to other variables. It is possible that the difficulties posed by having only a single coder were enough to "wash out" the limited relations that have been found in the past (Perry & Cooper, 1986).

Also as mentioned above, observer report measures and self report measures assess defenses based on different information. While observer report measures primarily rely on observable information, self-report measures primarily rely on internal information. While the DSQ does have some items that also assess more external information, it is possible that the differences in what is being assessed, in combination with the difficulties from having only a single defense coder, decreased the small relations found in other studies.

Finally, the DSQ and DMI showed numerous relations between the measures that were in a theoretically consistent direction. Part of the reason these self-report measures might relate so well to each other is that they share the same modality of assessment (i.e., self-report; Sammallahti et al., 1996). Although their method of self-report is somewhat different, an insightful and introspective person might be able to come to similar conclusions about themselves on either self-report measure. It is possible that this allowed for some level of overlap not found between the DSQ and the observer report DMRS in this study. Notably, the time between administration on these measures does not appear to have severely impacted the relation between their scores.

Previous research has noted that the DSQ and DMI do not demonstrate expected relations between the measures (Mehlman & Slane, 1994). An examination of this study, however, reveals that the authors appear to have only examined the relation between REV from the DMI and Denial and Projection from the DSQ. The present investigation, however, took a much broader look at the two measures and found much more substantial overlap. When looking at expected level of adaptiveness for defense levels and overall defensive functioning, it appears these two self-report measures are much more related than previous research has indicated.

Summary of Defense-Q and DSQ with DMRS and DMI. The pattern of findings where the Defense-Q was related to the other observer report measure but not to the self-report measure, whereas the DSQ was related to the other self-report measure but not to the observer report DMRS might further suggest that observer report measures are capturing something somewhat different than self-report measures. Previous researchers (Perry & Hoglend, 1998) have noted that differences in perspective or level of data collection result in lower correlations, and have

factored that into their hypotheses when looking at the similarity between observer and self-report measures of defenses. Other researchers (Bond et al., 1989) have noted that people may respond differently in situations where they are filling out a self-report questionnaire as opposed to when they are in a stressful interview. Additionally, factors related to the type of measurement (e.g., difficulty assessing unconscious phenomena on self-report or reliability of coding for individual defenses for observer report) might account for some of the disparity. It does not, however, explain why there is no relation between the DSQ and DMRS as has been previously found (Bond et al., 1989; Perry & Hoglend, 1998). As was noted, it may be that this is related to difficulties from having only a single coder complete the DMRS coding. Training an additional coder and having them also code the interviews using the DMRS might increase the relations of both the Defense-Q and DSQ to the DMRS.

Hypothesis 4: Defense-Q and DMRS with Physical Attractiveness

The lack of any significant relation between the Attractiveness Rating Scale item and the Defense-Q ADP Similarity Score, the 25 individual defenses on the Defense-Q, the DMRS ODF, or the DMRS defense levels and sublevel supports the hypothesis that these observational ratings are relatively free of bias from the attractiveness of the individual being assessed. As was noted by Eagly and colleagues (1991), the tendency for people to rate more attractive people more positively on other attributes (e.g., psychological adjustment) is mitigated by the presence of other relevant information. In the present case, it may be that the lack of a significant relation between attractiveness and any of the observationally rated defense scores is the result of the coder's attention being appropriately focused on the participant's defensive functioning. Regardless, it seems that attractiveness of the participant did not systematically bias coders on either the Defense-Q or DMRS ratings of defenses.

Overall Summary of Study 1

Self-report and observer report measures have independently demonstrated theoretically consistent relations to other constructs in the past (e.g., psychopathology, treatment outcome), but overall have not show strong relations to each other. This pattern in the literature has been further supported by the results from Study 1. One explanation proposed for this disparity is that the two methods may be assessing different aspects of the same construct (e.g., different aspects of the defense Undoing). One of the problems noted in the literature and apparent in the present results is that different measures of defenses conceptualize similarly named defense mechanisms

in different ways (e.g., Devaluation, Passive Aggression, & Turning Against Self as mentioned above). Additionally, a previously cited concern (Davidson et al., 2004) about observational measures, namely that observers can be biased by external cues such as the attractiveness of the participant, has been investigated and determined not to be evident in the present investigation. Moving on to Study 2, it will be important to consider differences in the conceptualization of defenses and the decreasing level of overlap among the Defense-Q and DSQ as the level of analysis narrows.

Having preliminarily examined the results of Study 1, I will now present Study 2. I will begin with a brief introduction and then I will present the method, results, and a brief discussion. Following the discussion for Study 2, I will conclude with an overall discussion of the results from both Studies 1 and 2 and discuss broader theoretical, research, and clinical implications.

STUDY 2

As indicated in the general introduction, there is a wealth of information on the relation between general maturity of defenses and both depression and anxiety. As Watson (2002) notes, however, there is a lack of information on whether specific defenses can predict particular disorders. As such, the current study will build on the research in the area and examine the extent to which the often found relations between defensive functioning and depressive or anxious symptomatology can predict group membership.

As noted, there are several methods of assessing defenses from which to choose when conducting research. Observer report measures provide interpretation of unconscious material that may not be accessible for individuals to self-report. They have demonstrated acceptable validity, but are often hampered by lower than desirable inter-rater reliability. Self-report measures, on the other hand, are more conducive to large-scale testing and have also shown acceptable validity. Furthermore, self-report measures are not hindered by inter-rater reliability problems. The limitation of self-report measures, however, is that they require a conscious reporting of unconscious processes. As such, authors have argued that self-report measures should be used alongside observer report measures of defenses (Davidson & MacGregor, 1998; Perry & Ianni, 1998). Spinhoven and colleagues (1995), for example, note that with the limitations associated with observer report methods as well as the limitations of self-report methods “it is preferable that these methods be used in conjunction with each other in order to improve the validity and reliability of the assessments of such elusive, complex, and subtle

processes as defense mechanisms" (p. 133). This is further supported by the findings of previous researchers (Bond et al., 1989), as well as those in Study 1 where it was found that similarly named individual defenses may have little relation between measures. The second study was therefore conducted with the Defense-Q and the DSQ. The observer report Defense-Q was used because it assesses a wide variety of defenses and because it has been demonstrated to have the highest inter-rater reliability even with a smaller number of coders on relatively brief pieces of clinical material (e.g., as opposed to the DMRS which has lower reliability for individual defenses and typically requires much longer clinical interviews). The self-report DSQ was used because it assesses a wide variety of individual defenses and has ample previous research to draw on given its status as the most widely used self-report measure of defenses.

Although numerous studies have shown a relation between individual defenses and depressive symptomatology or between defenses and anxious symptomatology, the results often indicate several of the same defense mechanisms are associated with both depressive and anxiety symptomatology. For example, Watson (2002) noted that depression and anxiety differentiation based on defenses would be difficult as Displacement was the primary predictor of Depression, Anxiety, Phobic Anxiety, and OCD scores in females and Projection was the primary predictor of Depression, Anxiety, and Phobic Anxiety, and the second best predictor of OCD in males. Some defenses, however, do appear to be related more to one type of symptomatology than the other. For example, Watson (2002) found Undoing was a predictor in Anxiety, Phobic Anxiety, and OCD but not Depression in females, and unrelated to any of the above scales in males. It may be that a few defenses such as Undoing will be the most likely defenses to aid in differentiation of anxiety and depression.

One issue to address for the present study is the debate as to the extent to which extreme scores from a nonclinical sample adequately represent scores of persons in a diagnosed clinical population. For example, some researchers (e.g., Coyne & Gotlib, 1983; Depue & Monroe, 1978) have argued that depression in college students is different from depression in psychiatric patients. Later research (e.g., Flett, Vredenburg, & Krames, 1997; Vredenburg, Flett, & Krames, 1993) has refuted these claims, arguing that the earlier claims that depression is different in college students than in psychiatric patients "are not well founded and that they are not supported by existing empirical evidence" (Vredenburg et al., 1993, p. 339). Indeed, Vredenburg and colleagues (1993) note that college students may present an advantage when studying depression

because they are less likely to have comorbid disorders and are less likely to be currently undergoing treatment, which could possibly obscure research results. In addition, for the most part results from scores of nonclinical populations closely match those of clinical populations. For example, Muris and Merckelbach (1994) noted that the defenses they found to contribute to the explanation of variance in college students' anxiety scores are the same defenses found to differentiate between those with and without an anxiety disorder in Pollock and Andrews (1989) research with patients. This, they indicate, is evidence that similar defense use can be found for those high in anxiety regardless of whether they have formal diagnoses. As such, it was determined that extreme scores in a nonclinical sample of university students was adequate to represent the groups of interest for the present study.

Hypotheses

Hypothesized Analyses

Due to a wealth of previous research investigating the relation of defenses to depression and anxiety, there is an abundance of information from which to draw upon when hypothesizing which defenses might best differentiate between the two types of disorders. The defenses most likely to enable a successful group differentiation are those that have previously been demonstrated to differ between persons with depression and persons with anxiety. Previous research has indicated that persons with depression score higher on Acting Out, Devaluation, Hypochondriasis, Isolation, Passive Aggression, Projection, and Projective Identification than do persons with anxiety. Research has also shown that persons with anxiety score higher on Idealization, Reaction Formation, and Undoing than do persons with depression. In addition, defenses that are both theoretically and empirically linked to one disorder, but have no theoretical relation to the other disorder should aid in group differentiation. Splitting has been related to depression both theoretically and empirically and is not theoretically related to anxiety. Similarly, Displacement is related to anxiety both theoretically and empirically and is not theoretically related to depression. As such, these defenses are the ones which were selected as the predictor variables for the discriminant analyses.

As mentioned above, each defense measure assesses different defenses and can conceptualize similarly named defenses differently. For example, although psychodynamic theories of depression have implicated Turning Against Self as a defense that is central to depression, many defense measures do not directly assess the defense. Bond (2004)

acknowledges his DSQ does not adequately assess the defense, stating "Turning Against the Self is not well measured by the DSQ" (p. 267). The DMRS and DSQ both incorporate aspects of Turning Against the Self in the defense Passive Aggression through noting that covertly resisting a more powerful other often results in self-sabotage. In addition, the self-loathing and blaming aspect of Turning Against the Self is captured within the defense Devaluation (of the self) on both the DMRS and DSQ. As such, in the analysis with the DSQ for Study 2, the defenses Devaluation and Passive Aggression will be used, and in the analysis for the Defense-Q the more theoretically consistent defense Turning Against Self will be used in their place. The argument that these similarly named defenses are conceptually different on the Defense-Q is supported by the results from Study 1, which indicate no relation between the Defense-Q and DSQ defenses for Devaluation (r = .03) and Passive Aggression (r = -.02). Instead, those aspects of Devaluation and Passive Aggression that are theoretically linked to depression appear in the more traditional Turning Against Self. Also, neither the Defense-Q nor the DSQ-72 assesses the defenses Hypochondriasis and Projective Identification so they cannot be tested in the present investigation.

With regard to defense styles, research has generally found that those with depression score higher on immature defenses than do those with anxiety. Additionally, research has generally demonstrated that those with anxiety score higher on neurotic level defenses than do those with depression. Finally, there is limited evidence from the literature that those with anxiety have elevated scores on mature defense styles. As such, I hypothesize that the Mature, Neurotic, and Immature Defense Styles will result in significant classification of participants in the depressed and anxious groups. Mature and Neurotic Defense Styles will be more representative of anxiety whereas Immature Defense Style will be more representative of depression.

Therefore, the three hypothesized (standard) discriminant analyses, assessing whether previously identified defenses can be used to classify participants correctly are:

1. Acting Out, Displacement, Idealization, Isolation, Projection, Reaction Formation, Splitting, Turning Against Self, and Undoing from the Defense-Q as independent (predictor) variables and group membership from the PAI as the dependent variable.
2. Acting Out, Devaluation, Displacement, Idealization, Isolation, Passive Aggression, Projection, Reaction Formation, Splitting, and Undoing from the DSQ as

independent (predictor) variables and group membership from the PAI as the dependent variable.

3. Mature Defense Style, Neurotic Defense Style, and Immature Defense Style from the DSQ as independent (predictor) variables and group membership from the PAI as the dependent variable.

Confirmatory Analyses

Because of the large number of identified defenses and wealth of previous research, there are several individual defenses that have been found to be related to depression, anxiety, or to both depression and anxiety. The first two analyses in Study 2 will determine the extent to which specific individual defenses can differentiate between groups using the well-supported defenses from the literature. Because, however, numerous other defenses have been shown to be related to depression and anxiety, it is possible that other defenses will also aid in effective differentiation of the groups. As such, previous researchers (e.g., Fulde, Junge, & Ahrens, 1995; Spinhoven & Kooiman, 1997; Watson, 2002) have opted to use stepwise analyses to explore which defenses are related to variables of interest. Fulde and colleagues, for example, used a stepwise discriminant analysis to determine the extent to which defenses could correctly classify persons who had poor or good outcomes after lumbar surgery.

Following the design of Fulde and colleagues, stepwise discriminant analyses were used to determine which defenses best differentiate between those in the depressed and anxious groups using both the Defense-Q and DSQ individual defenses. These stepwise analyses were used to confirm both that the hypothesized defenses are the most useful defenses in classification between the groups as well as to explore the extent to which other defenses might also contribute to group classification. As such, it is hypothesized that, in general, the defenses that contribute most to the differentiation in the stepwise analyses will be those highlighted in the hypothesized analyses.

Specifically, the two confirmatory stepwise discriminant analyses, assessing whether additional defenses can add to the information from the previously identified defenses when classifying participants are:

1. Acting Out, Devaluation, Displacement, Dissociation, Fantasy, Grandiosity, Humour, Idealization, Identification With the Aggressor, Intellectualization, Isolation, Neurotic Denial, Passive Aggression, Projection, Pseudoaltruism,

Psychotic Denial, Rationalization, Reaction Formation, Regression, Repression, Splitting, Sublimation, Turning Against Others, Turning Against Self, and Undoing from the Defense-Q as independent (predictor) variables and group membership from the PAI as the dependent variable.

2. Acting Out, Anticipation, Denial, Devaluation, Displacement, Dissociation, Fantasy, Humour, Idealization, Isolation, Passive Aggression, Projection, Pseudoaltruism, Rationalization, Reaction Formation, Somatization, Splitting, Sublimation, Suppression, and Undoing from the DSQ as independent (predictor) variables and group membership from the PAI as the dependent variable.

Method

Participants

A sample of 1182 participants (868 female – 73.43%) were recruited from the Introductory Psychology classes at the University of Saskatchewan. The participant's age ranged from 17 to 40 years (M = 19.56; SD = 2.58). All participants received partial course credit for participation.

Measures

Defense-Q. See Study 1 for a description of the Defense-Q.

Defense Style Questionnaire. See Study 1 for a description of the DSQ.

Personality Assessment Inventory. The PAI (Morey, 1991) is a 344-item self-report inventory that participants respond to on a Likert scale ranging from 0 (*false, not at all true*) to 3 (*very true*). The 344 items can be combined into 22 nonoverlapping scales: Four validity scales (Inconsistency, Infrequency, Negative Impression, Positive Impression), 11 clinical scales (Somatic Complaints, Anxiety, Anxiety Related Disorders, Depression, Mania, Paranoia, Schizophrenia, Borderline Features, Antisocial Features, Alcohol Problems, & Drug Problems), five treatment scales (Aggression, Suicidal Ideation, Stress, Nonsupport, & Treatment Rejection), and two interpersonal scales (Dominance & Warmth). In addition to full scale scores, each of the clinical scales is comprised of subscales. For example, Depression (DEP; cognitive, affective, & physiological), Anxiety (ANX; cognitive, affective, & physiological), and Anxiety Related Disorders (ARD; obsessive-compulsive, phobias, & traumatic stress), each have three subscales (Morey, 1991). Only the validity and three relevant clinical scales (i.e., DEP, ANX, & ARD) were used in the present investigation.

Scores on the PAI are converted to *T*-scores according to norms from the PAI manual (Morey, 1991). Each scale (e.g., DEP, ANX, & ARD) has a mean of 50*t* and a standard deviation of 10*t*. A score of 70*t* represents scores in the extreme 2% of normal scores and "represents a pronounced deviation from the typical responses of adults living in the community" (Morey, 1991, p. 11). Moreover, Morey (2003) argues that "a score of 70*t* … represents a degree of problems and symptoms that is very unusual in the general population, thus most likely indicating a problem of clinical significance" (p. 28).

The clinical scales of the PAI have been found to have good internal consistency across the community, college, and clinical samples for which norms are provided. Of the scales used in the current investigation ANX has consistently been found to have the highest internal consistency (.90, .89, & .94 respectively for community, college, & clinical samples) followed by DEP (.87, .87, & .93 respectively) and ARD (.76, .80, & .86 respectively; Morey, 1991). In addition, all clinical scales have demonstrated good temporal stability over 3-4 weeks. Specifically, mean test-retest reliability was .88 for ANX, .83 for ARD, and .87 for DEP (Morey, 1991). In terms of *T* Scores, mean absolute difference in scores over the 3-4 weeks was 3.7*t* for ANX, 4.5*t* for ARD, and 3.5*t* for DEP (Morey, 1991).

Procedure

Participants completed the DSQ and PAI. Also, participants underwent the ESI. It is this interview that was the data source from which coders observationally rated participants' defense use using the Defense-Q. All interviews were independently watched and rated by trained coders using the Defense-Q.

Groups. Participants were grouped according to their scores on the PAI. All participants with a score on the PAI DEP scale indicating that they likely have depressive symptomatology that warrants clinical attention (i.e., 70*t* or higher) were considered for the "depressed group". In order to eliminate those students who also have prominent anxiety symptomatology, all students with either an ANX or ARD score on the PAI that is indicative of anxiety symptomatology that warrants clinical attention (i.e., 70*t* or higher) were excluded from the depressed group. Similarly, all students with a score of 70*t* on the PAI ANX scale or PAI ARD, and less than 70*t* on the DEP scale were considered for the "anxious group". In total, 104 participants met criteria for the anxious group and 39 participants met criteria for the depressed group.

Prior to grouping participants were removed if they produced profiles that were likely invalid according to the PAI manual. Those with high scores on Inconsistency (ICN; ≥ 73*t*) and Infrequency (INF; ≥ 75*t*) scales were used to identify participants responding in a careless or idiosyncratic manner (Morey, 1991; 2003). The Rogers Discriminant Function (RDF) was chosen as an additional validity index to identify malingering as it has been identified as the most effective index at identifying both coached and naive respondents trying to simulate psychopathology and is unrelated to actual psychopathology scores (Morey, 2003; Morey & Lanier, 1998). The cut-off score of 0.57 was chosen to identify malingering participants because it was identified by Morey and Lanier as providing the fewest incorrect decisions. Given that the present study is concerned only with removing those feigning psychopathology, no positive distortion validity indices were used. Of the 1182 participants, 83 had elevated RDF scores, 40 had elevated INF scores, and 16 had elevated ICN scores. After eliminating invalid profiles, 96 participants met criteria for the anxious group and 25 met criteria for the depressed group.

Study 2 Results

Discriminant Analysis

Discriminant analysis was originally designed as a method of classification into groups, but has more recently gained popularity in studying group differences on several variables simultaneously (Pedhazur, 1997). Discriminant analysis has many similarities to MANOVA, with an important difference being that the independent and dependent variables are switched, reflecting a difference in the conceptual basis of studies employing this analysis (Leech et al., 2005). An overall classification rate is produced and the predictor variables contributing to the overall classification rate can be determined by looking at their respective coefficients.

Standardized versus structure coefficients. The discriminant analysis produces both standardized as well as structure coefficients. Standardized coefficients are useful for interpretation in that their relative magnitudes can be interpreted as the relative importance of the dependent variable to the discrimination between groups (i.e., the discriminant function; Pedhazur, 1997). The standardized coefficient, however, is affected by the variance and covariance of the other predictor variables in the study. That is, the extent to which a variable contributes to the discrimination between groups (i.e., it's "importance" in the discriminant function) depends on which other variables are being simultaneously examined. It is possible that a predictor variable can be highly correlated with the final discriminant function, but have a low

standardized coefficient (and thus be interpreted as "unimportant" in predicting the group classification) because it is highly correlated with another predictor variable in the analysis (Leech et al., 2005; Pedhazur, 1997).

Structure coefficients, on the other hand, are not affected by the other variables in the analysis in the same way that standardized coefficients are. They provide an index of the correlation between the predictor variable and the resulting discriminant function (Leech et al., 2005). The structure coefficient, however, does not provide the relative importance of the dependent variable to the resulting discriminant function in the same way that a standardized coefficient does (Pedhazur, 1997). To compensate for the different strengths and weaknesses, both standardized and structure coefficients were reported for the present study. The analysis primarily uses the standardized coefficients, but the structure coefficients will be discussed where applicable. Following the guidelines of Pedhazur (1997) as well as Masters and Wallston (2005) coefficients of .30 or greater were considered meaningful for interpretation.

Standard versus stepwise discriminant analysis. In addition to the standard discriminant analysis where the predictor variables are predetermined by the researcher, a stepwise discriminant analysis can be conducted if the aim is to develop a prediction equation (Tabachnick & Fidell, 2001). The initial three (hypothesized) analyses in the present study used a standard discriminant analysis to enable the specific inclusion of defenses hypothesized to differentiate between groups, whereas the subsequent two (confirmatory) analyses used stepwise discriminant analyses to confirm that the hypothesized defenses are among the most important for differentiation and to explore the use of defenses in differentiating between the depressed and anxious groups further. The stepwise procedure adds variables into the equation in the order that maximizes differentiation between groups. Following the guidelines of Tabachnick and Fidell (2001) an entering criterion of .20 was used to ensure entry of all important variables. If a variable no longer contributes to differentiation after originally entering the equation, it is removed from the analysis. Although the stepwise procedure is useful at determining which variables from a larger set of variables will contribute uniquely to differentiation between groups, the analysis selects predictor variables based on statistical criteria in a sample and sometimes works too well in that sample (Tabachnick & Fidell, 2001). As such, a cross-validation procedure was used for all standard and stepwise discriminant analyses to minimize biases resulting from the specific sample.

Cross-validation. Various types of cross-validation procedures exist, all having the common feature of withholding cases so that the prediction equation is tested on cases that did not contribute to the equation itself. SPSS uses one of the most economical cross-validation procedures in terms of participant numbers. It ensures that each case is classified by functions derived from all cases other than the one being classified. This procedure minimizes trivial sample-specific differences and provides a more accurate representation of classification rates in the population (Tabachnick & Fidell, 2001). Classification rates prior to and after cross-validation were presented in the present study.

Assumptions of discriminant analysis. The assumptions of discriminate analysis include multivariate normality and an absence of multicollinearity. Multivariate normality includes linearity, lack of homoscedasticity, univariate normality (no skewed or kurtotic distributions or significant univariate outliers) and no multivariate outliers (Leech et al., 2005; Tabachnick & Fidell, 2000). Although discriminate analysis is fairly robust to these assumptions with large and relatively equal sample sizes, a lack of multivariate normality may negatively affect accuracy of estimates or probability of correct classification (Leech et al., 2005). Therefore, equal sample size across groups will maximize classification rates, but is not necessarily required (Tabachnick & Fidell, 2001). Additional considerations for conducting a discriminant analysis are that the sample size of the smallest group must be larger than the number of predictors unless a stepwise method is used (Leech et al., 2005; Tabachnick & Fidell, 2001). Assumptions were reviewed for all discriminate analyses to ensure they had been met.

Unequal sample size. As mentioned above, unequal sample sizes cause no special problems in discriminant analysis, although they do necessitate a decision on whether to factor the difference in group sizes into the classification process (Tabachnick & Fidell, 2001). A correction can be made in SPSS that sets probabilities to reflect group sample sizes (Field, 2005; Leech et al., 2005). While including group size into the equation might maximize the classification rate, the question in the current investigation is to what extent the participants can be classified on their defense use alone[16]. As such, group size was not reflected in the analysis and participants were classified by defense use only[17].

[16] For this reason the groups are not separated on age, sex, or any other variable either. Only defense use is included in the analysis to differentiate the groups.

[17] This changes the classification rates but not the rest of the analysis (e.g., significance or coefficient values). The interested reader is referred to Appendix J for a comparison of corrected vs. noncorrected classification rates.

Present study. As the goal of the present study is to predict group membership (i.e., depressed or anxious) based on a set of predictors (i.e., the defense mechanisms), discriminant analyses were used (Leech et al., 2005; Tabachnick & Fidell, 2000). The first discriminant analysis was used to determine the degree to which the hypothesized defenses from the Defense-Q successfully predict membership in the depressed and anxious groups. Similarly, the second discriminant analysis was used to determine the degree to which the hypothesized defenses from the DSQ successfully predict membership in the depressed and anxious groups. Finally, a discriminant analysis was used to determine the degree to which the defense styles from the three-factor DSQ successfully predict membership in the depressed and anxious groups. In the first two analyses, group membership served as the dependent variable and the individual defenses served as the independent (predictor) variables (Leech et al., 2005; Tabachnick & Fidell, 2000). In the third analysis, group membership served as the dependent variable and the defense styles served as the independent (predictor) variables (Leech et al., 2005; Tabachnick & Fidell, 2000). To explore the extent to which defenses can be used to predict membership in either the depressed or anxious group further, two confirmatory analyses were conducted using all of the individual defenses from the Defense-Q (Confirmatory Analysis 1) and the DSQ (Confirmatory Analysis 2). In each of these confirmatory analyses, group membership served as the dependent variable and the individual defenses served as the independent (predictor) variables (Leech et al., 2005; Tabachnick & Fidell, 2000).

Hypothesized Analysis 1 (Defense-Q Individual Defenses)

Discriminant analysis was conducted to assess the extent to which nine defenses (Acting Out, Displacement, Idealization, Isolation, Projection, Reaction Formation, Splitting, Turning Against Self, & Undoing) from the Defense-Q could accurately distinguish between participants in the depressed and anxious groups. In total, 58 participants in the anxious group and 19 participants in the depressed group completed all measures and were included in the analysis.

Assumptions. I will first address outliers followed by normality, and then multicollinearity. Screening for outliers was conducted separately for each group (depressed & anxious) using procedures outlined by Tabachnick and Fidell (2001). Assessment for univariate outliers was conducted using *z*-scores (greater than $z = 3.29$ was considered an outlier) and assessment for multivariate outliers was conducted using Mahalanobis distance scores, which vary according to the number of predictors in the analysis. No participants from either the

depressed or anxious group had *z*-scores over 3.29 on any predictor variable, which indicates that there were no univariate outliers. No participants produced a Mahalanobis distance value greater than the critical χ^2 for 9 *df* (27.88) on any predictor variable in either group, which indicates that there were no multivariate outliers.

No ideal test exists for testing multivariate normality. Instead, Tabachnick and Fidell (2001) recommend examining univariate normality and linearity for each group as well as homoscedasticity. Univariate normality was assessed separately for each group by examining predictor variables for skewness and kurtosis. No scores for any participant in either group were significantly skewed or kurtotic. The presence of a linear relation between all variables was assessed in the current study by examining matrix scatterplots (Leech et al., 2005). No curvilinear relations were noted, indicating that linearity can be assumed. Homoscedasticity was assessed by Box's M test to assess the homogeneity of variance-covariance matrices. Box's M was not significant ($p = .219$), indicating that homogeneity of the variance-covariance matrices can be assumed.

The discriminant analysis in SPSS is designed to remove problematic variables if singularity/multicollinearity exists between two variables. As such, Tabachnick and Fidell (2001) note that singularity screening can be done by running the analysis to see if the program reports tolerance violations. If the program runs the analysis, then no singularity exists. If tolerance levels for an individual variable are too low (between .01 and .0001 depending on the program used), then the variable will be automatically removed from the analysis. No variables in the current analysis had tolerance values less than .01 (Range = .57 - .97), indicating that there is no problem with multicollinearity for individual predictor variables. However, Tabachnick and Fidell also outline a procedure to assess multicollinearity of combinations of variables, rather than between two individual variables. The authors argue that multicollinearity for a combination of several variables may be present if a condition index is over 30 and at least two of the variance proportions for individual variables are greater than .50. Although two condition indices were greater than 30 in the present analysis, only one (condition index = 31.28) had a variance proportion greater than .50. None of the condition indices over 30 had at least two variance proportions greater than .50, indicating that there is no problem with multicollinearity for combinations of variables.

Results. Wilks' lambda was significant, $\lambda = 0.72$, $\chi^2 = 22.84$, $p = .007$, which indicates that the overall model was able to distinguish between participants in the depressed and anxious groups significantly. Table 8 presents the standardized coefficients, structure coefficients, means and standard deviations for all variables. The standardized coefficients indicated that Acting Out, Turning Against Self, Projection and Isolation all uniquely contributed to distinguishing between participants in these groups. The mean scores for Acting Out, Turning Against Self, Projection and Isolation indicate that they are more representative[18] of the depressed group than the anxious group. Additionally, although the standardized coefficient for Reaction Formation did not indicate that it uniquely contributed to the discriminant function, the structure coefficient indicated that Reaction Formation was significantly correlated with the resulting discriminant function. Table 9 displays the intercorrelation values for all of the defenses in the analyses, which indicates that Reaction Formation had a medium correlation with one of the significant predictors, namely Acting Out. Additionally, Reaction Formation had a small correlation with another variable in the analysis (i.e., Undoing). Classification results indicated that the model correctly classified 77.9% of participants overall, with 77.6% of anxious and 78.9% of depressed participants being correctly classified. On cross-validation the model continued to classify 71.4% of participants overall, with 72.4% of anxious and 68.4% of depressed participants being correctly classified.

Hypothesized Analysis 2 (DSQ Individual Defenses)

Discriminant analysis was conducted to assess the extent to which 10 defenses (Acting Out, Devaluation, Displacement, Idealization, Isolation, Passive Aggression, Projection, Reaction Formation, Splitting, & Undoing) from the DSQ could accurately distinguish between participants in the depressed and anxious groups. In total, 92 participants in the anxious group and 25 participants in the depressed group completed all measures and were included in the analysis.

Assumptions. The same procedures used to examine the analysis assumptions in the first discriminant analysis were used in the remaining discriminant analyses. As such, the results but not the procedure for testing the assumptions will be presented for the remaining analyses. There were no univariate outliers in either the depressed or anxious group. One participant (anxious

[18] Discriminant analysis does not assess whether individual variables are significantly different between groups. Discussion of representativeness is intended to highlight where high scorers are more likely to be classified.

group) had a Mahalanobis distance (32.38) larger than the critical χ^2 for 10 *df* (29.59) and was removed from the analysis[19]. The predictor variable Splitting was kurtotic ($z = 3.31$) in the depressed group and no other variables were skewed or kurtotic in either group. Several transformations were tested (i.e., cubed, squared, log10, square root, inverse, & inverse squared) and a square root transformation best corrected the kurtosis of Splitting without creating skewness or kurtosis problems for Splitting in either group. However, because interpretation is difficult with transformed variables and the analysis was not meaningfully different with or without the transformed variable, the untransformed Splitting was retained for the analysis[20]. The assumptions of linearity and of homogeneity of the variance-covariance matrices were met ($p = .140$ for Box's M) and there were no problems with multicollinearity on individual or combinations of variables (tolerance range = .51 - .87; no condition index over 30).

Results. Wilks' lambda was significant, $\lambda = 0.83$, $\chi^2 = 21.00$, $p = .021$, which indicates that the overall model was able to distinguish between participants in the depressed and anxious groups significantly. Table 10 presents the standardized coefficients, structure coefficients, means and standard deviations for all variables. The standardization coefficients indicated that Reaction Formation, Isolation (negative), and Undoing all uniquely contributed to distinguishing between participants in these groups. Reaction Formation and Undoing were more representative of the anxiety group and Isolation was more representative of the depressed group. Additionally, although Idealization and Displacement did not uniquely contribute to the discriminant function, their structure coefficients indicated that they were significantly correlated to the resulting discriminant function. As can be seen in Table 11, Idealization had a medium correlation with one of the significant predictors in the analysis (i.e., Reaction Formation) as well as with another predictor (i.e., Acting Out) and Displacement had a small correlation with two of the other predictor variables in analysis (i.e., Acting Out & Passive Aggression). Classification results indicated that the model correctly classified 69.0% of participants overall, with 70.3% of anxious and 64.0% of depressed participants being correctly classified. On cross-validation the model continued to classify 64.7% of participants overall, with 64.8% of anxious and 64.0% of depressed participants being correctly classified.

[19] Results from the analyses with and without this case were not meaningfully different in any way.

Hypothesized Analysis 3 (DSQ Defense Styles)

Discriminant analysis was conducted to assess the extent to which three defense styles (Mature, Neurotic, & Immature) from the DSQ could accurately distinguish between participants in the depressed and anxious groups. In total, 91 participants in the anxious group and 25 participants in the depressed group completed all measures and were included in the analysis.

Assumptions. There were no univariate outliers and no participants had a Mahalanobis distance larger than the critical χ^2 for 3 *df* (16.27). None of the predictor variables were significantly skewed or kurtotic in either group. The assumptions of linearity and homogeneity of the variance-covariance matrices ($p = .682$ for Box's M) were met and there were no problems with multicollinearity (tolerance range = .84 - .99; no condition index over 30).

Results. Wilks' lambda was significant, $\lambda = 0.85$, $\chi^2 = 17.90$, $p < .001$, which indicates that the overall model was able to distinguish between participants in the depressed and anxious groups significantly. Table 12 presents the standardized coefficients, structure coefficients, means and standard deviations for all variables. The standardized coefficients indicated that Neurotic and Immature Defense Styles (negative) uniquely contributed to distinguishing between participants in these groups of the defenses entered in this analysis. Neurotic Defense Style was more representative of the anxiety group and Immature Defense Style was more representative of the depressed group. Additionally, although the standardized coefficient for Mature Defense Style was not significant, the structure coefficient indicated that Mature Defense Style was significantly correlated with the resulting discriminant function. Table 13 presents the intercorrelations for the defense styles, which indicated that Mature Defense Style had a medium correlation with one of the significant predictors, namely Neurotic Defense Style. Classification results indicated that the model correctly classified 64.7% of participants overall, with 64.8% of anxious and 64.0% of depressed participants being correctly classified. On cross-validation the model was unchanged and continued to classify 64.7% of participants overall, with 64.8% of anxious and 64.0% of depressed participants being correctly classified.

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[20] In general, kurtosis is not a problem in discriminant analysis, as was noted by Joachimsthaler & Stam (1988) who found that over 4 kurtotic samples using 4 types of discriminant analyses, none produced lower classification rates.

Confirmatory Analysis 1 (Defense-Q Defenses)

Discriminant analysis was conducted to assess the extent to which 25 defense mechanisms (Acting Out, Devaluation, Displacement, Dissociation, Fantasy, Grandiosity, Humour, Idealization, Identification With the Aggressor, Intellectualization, Isolation, Neurotic Denial, Passive Aggression, Projection, Pseudoaltruism, Psychotic Denial, Rationalization, Reaction Formation, Regression, Repression, Splitting, Sublimation, Turning Against Others, Turning Against Self, & Undoing) from the Defense-Q could accurately distinguish between participants in the depressed and anxious groups. In total, 58 participants in the anxious group and 19 participants in the depressed group completed all measures and were included in the analysis.

Assumptions. A stepwise discriminant analysis allows researchers to use more predictor variables than the number of participants in the smallest group. Only the significant predictors are entered and the analysis protects against multicollinearity problems. The present analysis would not run due to insufficient tolerance values with both Acting Out and Pseudoaltruism in the analysis. In this situation, Tabachnick and Fidell (2001) recommend choosing the variable to delete on logical rather than purely statistical grounds. Given that Acting Out is one of the hypothesized defenses but Pseudoaltruism is not, Acting Out was chosen to remain in the analyses and Pseudoaltruism was removed prior to the remaining assumptions being assessed.

One participant (anxious group) had a univariate outlier score on Psychotic Denial (z = 3.54) and this participant was eliminated from the analysis[21]. No participant had a Mahalanobis distance larger than the critical χ^2 for 24 *df* (51.18). No variables were skewed or kurtotic. The assumption of linearity and homogeneity were met (p = .349 for Box's M).

Of the remaining 24 variables, none had tolerance values less than .01 (Range = .20 - .56), indicating that there were no other problems with multicollinearity for individual variables. Of the 25 condition indices, 12 were greater than 30. Only the 25th condition index (636.82) had at least two variance proportions greater than .50 (these variance proportions were for Humour, Isolation, Neurotic Denial, Regression, Repression, Turning Against Self, & Undoing). This indicated that there may have been a problem with multicollinearity for combinations of variables, which could affect the selection of defenses depending on the combination of other defenses already selected in the analysis. The defense mechanism with the highest variance

[21] Results from the analyses with and without this case were not meaningfully different in any way.

proportion (.65) was Neurotic Denial. Deleting this variable reduced the condition index (369.04) and only one variable (Repression) had a variance proportion greater than .50. The only meaningful difference between the analyses with and without Neurotic Denial, however, was that Neurotic Denial was no longer a predictor when excluded. As such, the variable was left in the analyses. No other variables entered or failed to enter and the top predictors did not change relative position, so multicollinearity from the combinations of variables did not adversely affect the analysis with Neurotic Denial included.

Results. Wilks' lambda was significant, $\lambda = 0.54$, $\chi^2 = 42.72$, $p < .001$, which indicates that the overall model was able to distinguish between participants in the depressed and anxious groups significantly. Eleven defenses were selected as improving the model that differentiates between the groups. The defenses entered in the following order: Acting Out, Turning Against Self, Repression, Projection, Turning Against Others, Fantasy, Dissociation, Idealization, Isolation, Psychotic Denial, and Neurotic Denial. Table 14 presents the standardized coefficients, structure coefficients, means and standard deviations for each variable selected. The standardized coefficients indicated the proportion to which the 11 defenses uniquely contributed to distinguishing between participants in these groups. Classification results indicated that the model correctly classified 84.2% of participants overall, with 84.2% of anxious and 84.2% of depressed participants being correctly classified. On cross-validation the model continued to classify 75.0% of participants overall, with 75.4% of anxious and 73.7% of depressed participants being correctly classified.

Confirmatory Analysis 2 (DSQ Defenses)

Discriminant analysis was conducted to assess the extent to which 20 defense mechanisms (Acting Out, Anticipation, Denial, Devaluation, Displacement, Dissociation, Fantasy, Humour, Idealization, Isolation, Passive Aggression, Projection, Pseudoaltruism, Rationalization, Reaction Formation, Somatization, Splitting, Sublimation, Suppression, and Undoing) from the DSQ could accurately distinguish between participants in the depressed and anxious groups. In total, 91 participants in the anxious group and 25 participants in the depressed group completed all measures and were included in the analysis.

Assumptions. One participant (anxious group) had a univariate outlier score on Neurotic Denial ($z = 3.44$) and this participant was eliminated from the analysis[22]. No participant had a Mahalanobis distance larger than the critical χ^2 for 20 *df* (45.32) in either group. Splitting was significantly kurtotic ($z = 3.30$) in the depressed group and no other predictor variable was skewed or kurtotic in either group. Several transformations were tested (cubed, squared, log10, square root, inverse, & inverse squared) and a square root transformation best corrected the kurtosis of Splitting without creating skewness or kurtosis problems in either group. Because transformation would add a level of complication to comparing the current results to the literature and Splitting did not enter into the analysis whether transformed or not, no transformation was made for the analysis. The assumption of linearity and homogeneity ($p = .214$ for Box's M), were met. There were no problems with multicollinearity for individual variables (tolerance range = .41 - .77). Of the 21 condition indices, 2 were greater than 30. The 20th condition index (32.82) had only one variance proportions greater than .50 and no other condition index had any variance proportions over .50, which indicates that there was no problem with multicollinearity for combinations of variables.

Results. Wilks' lambda was significant, $\lambda = 0.78$, $\chi^2 = 27.93$, $p < .001$, which indicates that the overall model was able to distinguish between participants in the depressed and anxious groups significantly. Five defenses were selected as improving the model that differentiated between the groups. The defenses entered in the following order: Reaction Formation, Isolation, Undoing, Suppression, and Sublimation. Table 14 presents the standardized coefficients, structure coefficients, means and standard deviations for each variable selected in the analysis. The standardized coefficients indicated the proportion to which the five defenses uniquely contributed to distinguishing between participants in these groups. Classification results indicated that the model correctly classified 73.9% of participants overall, with 75.6% of anxious and 68.0% of depressed participants being correctly classified. On cross-validation the model was unchanged and continued to classify 71.3% of participants overall, with 72.2% of anxious and 68.0% of depressed participants being correctly classified.

[22] Results from analyses run with this participant did not meaningfully alter classification rates, although some predictors change relative position and Anticipation, Dissociation, and Fantasy are added as a predictor variables.

Study 2 Discussion

Hypothesized Analysis 1 (Defense-Q Individual Defenses)

The first hypothesis for Study 2 was that the individual defenses from the Defense-Q that were selected from previous research and theory could be used to classify participants into the depressed and anxious groups correctly. Probability was set equally, giving each participant a 50% chance to go into each group. After cross-validation participants were significantly more likely than chance to be correctly classified using the defense mechanism information. All four of the defenses that were important for classification using the discriminant function (Acting Out, Turning Against Self, Projection, & Isolation) were defenses identified in the literature as more predominant in people with depression than in people with anxiety. Consistent with these findings, all four defenses were more representative of the depressed than the anxious group in this analysis. Although Reaction Formation did not have a significant standardized coefficient in the present study, it did have a medium sized correlation with the resulting discriminant function. An examination of the correlation between the defenses revealed that Reaction Formation had a medium correlation with Acting Out, which was already a significant predictor. The medium correlation with Acting Out as well as a small significant correlation with Undoing would reduce the unique contribution by Reaction Formation and may have been the reason it was not identified by the standardized coefficient as a significant unique predictor variable despite the significant medium correlation with the resulting discriminant function.

Previous researchers have identified Acting Out (Hoglend & Perry, 1998), Projection (Bronnec et al., 2005; Corruble et al., 2004; Hoglend & Perry, 1998; Holi et al., 1999; Watson, 2002) and Isolation (Spinhoven & Kooiman, 1997; Watson, 2002) as defenses found in those with higher levels of depressive symptomatology. Moreover, all three of these defenses have been found to be used more often by those with depression than those with anxiety (Bloch et al., 1993; Spinhoven & Kooiman, 1997). As was mentioned previously, Turning Against Self is not assessed by most defense measures, but has been identified as a predominant defense for depression in psychodynamic theory (Freud, 1917/2001; Milrod, 1988; Rudden et al., 2003; White & Watt, 1973b). Popular measures such as the DSQ and DMRS incorporate this defense into other defenses (i.e., Devaluation & Passive Aggression), thus complicating an integration of the theory and research.

Combined, the defenses resulted in a correct classification of 72.4% of the anxious participants, 68.4% of the depressed participants and 71.4% of the participants overall. This is a significantly higher percentage than the 50% probability of which the analysis originally set classification. Although defense mechanisms can clearly contribute information to the differentiation of those in the depressed and anxious groups, nearly 30% of participants remain incorrectly classified. Therefore, while these results are promising and indicate defenses warrant further examination of their utility in psychological assessment and diagnosis, the results also indicate that defenses alone are not sufficient for making accurate group differentiation for such an important task as psychological assessment.

Hypothesized Analysis 2 (DSQ Individual Defenses)

The second hypothesis for Study 2 was that the individual DSQ defenses identified in previous research and theory could be used to classify participants into the depressed and anxious groups correctly. As was found with the Defense-Q, participants were significantly more likely than chance to be classified correctly using the individual DSQ defenses. Three defenses (Reaction Formation, Undoing, & Isolation) were identified as important for classification using the discriminant function. Two of these defenses (Reaction Formation & Undoing) were defenses identified in the literature as being found more predominantly in people with anxiety than depression, while the other (Isolation) has been found to be used more by those with depression than anxiety. Consistent with previous literature, Reaction Formation and Undoing were more representative of the anxious group, while Isolation was more representative of the depressed group. As was found with the DSQ, some defenses (i.e., Idealization & Displacement) with significant correlations with the resulting discriminant function did not produce significant standardized coefficients. Idealization had a medium correlation with Reaction Formation as well as a small significant correlation with Acting Out. Similarly, Displacement had small significant correlations with Acting Out and Passive Aggression. These correlations with other defenses in the analysis may have sufficiently decreased the unique contributions of the defenses to the point where they no longer added a sufficient amount of unique information to be significant predictors despite their medium correlation with the resulting discriminant function.

Previous researchers have identified elevated use of Reaction Formation (Andrews, Singh, & Bond, 1993; Pollock & Andrews, 1989) and Undoing (Andrews, Singh, & Bond, 1993; Birmes et al., 2000; Kipper et al., 2004; 2005; Muris & Merckelbach, 1994; Pollock & Andrews,

1989; Watson, 2002; Yuan, Bao Zhang, & Qin Wu, 2002) by those with anxiety. Additionally, Isolation has been found to be related to depressive symptomatology (Spinhoven & Kooiman, 1997; Watson, 2002). In terms of differentiating between the two groups, all three defenses have been found to be important in differentiating persons with depression and anxiety (Busch et al., 1995; Spinhoven & Kooiman, 1997). Examining the defenses found to be most important for discriminating between the depressed and anxious groups using the self-report DSQ, it seems that the discriminant function is more heavily weighted toward anxiety-related defenses than toward depression-related defenses.

As was mentioned, Displacement had a medium correlation with the discriminant function. Interestingly, although Displacement has been found to account for a significant portion of the variance in depression scores before (Holi et al., 1999; Watson, 2002) it is typically considered a defense more related to anxiety (Andrews, Singh, & Bond, 1993; Holi et al., 1999; Pollock & Andrews, 1989; Watson, 2002). In the present study, however, the mean score was highest in the depressed as opposed to the anxious group, although this difference was not sufficient enough that Displacement uniquely contributed enough to be considered important for classification. Looking at the three Displacement items on the DSQ 72, they are "Doctors never really understand what is wrong with me", "When I am depressed or anxious, eating makes me feel better" and "I smoke when I am nervous". One of these items may be assessing Displacement of blame to doctors, but the other two items seemingly tap consumption while the person is not feeling well. These are not assessing the traditional understanding of Displacement, where negative feelings from a threatening target are displaced onto a less threatening target. Holi and colleagues (1999) have also noted that items on the DSQ-72 are perhaps more indicative of depression-related behaviours than of the defense Displacement. It may be that this finding is an artifact of the items on the DSQ Displacement scale.

Only Isolation was found to be an important predictor across both the Defense-Q and DSQ individual defense analyses when using the standardized coefficients. This suggests that aspects of Isolation that are apparent both to observers as well as to the individuals themselves co-occur with depressive symptomatology and help to differentiate it from anxiety. Interestingly, previous researchers using the Defensive Functioning Scale from the *DSM* have found that the defense level containing Isolation is negatively related to depressive symptomatology in a patient sample (DeFife & Hilsenroth, 2005). A closer examination of this result, however, reveals that

the defensive level contains two other defenses, Intellectualization and Undoing. This is true for the DMRS defensive levels as well. While Isolation appears to be related to increased depressive symptomatology in the literature, Undoing has been shown to be related to decreased depressive symptomatology (Busch et al., 1995). While using defensive levels rather than individual defenses can increase the reliability of the scores, it can create problems such as the one highlighted here where different defenses within the level have opposite patterns for the relations in question.

Additionally, Reaction Formation was found to be an important predictor for the DSQ analysis and had a medium correlation with the Defense-Q discriminant function. When differentiating between depression and anxiety on either observer or self-reporting of defenses, it may be that Isolation is an important defense for identifying depression, whereas Reaction Formation may be important for identifying anxiety. This is tempered somewhat because Reaction Formation did not have a significant standardized coefficient in the Defense-Q analysis, perhaps in part due to the correlations with Acting Out and Undoing. Further investigation is warranted to elucidate the importance of these defenses in differentiation between depression and anxiety.

Combined, the defenses resulted in a correct classification of 64.8% of the anxious participants, 64.0% of the depressed participants and 64.7% of the participants overall. As was found with the Defense-Q individual defenses, this is a significantly higher percentage than the 50% probability the analysis originally set classification at. This percentage is somewhat lower than the 71.4% overall classification rate for the Defense-Q analysis.

Hypothesized Analysis 3 (DSQ Defense Styles)

The third hypothesis for Study 2 was that the DSQ defense styles could be used to classify participants into the depressed and anxious groups correctly. As was found with individual defense mechanisms on both the Defense-Q and DSQ, the DSQ defense styles resulted in significantly more participants being correctly classified than would be expected by chance. Two of three defense styles (Neurotic & Immature) were identified as important for classification using the discriminant function while the third defense style (Mature) was significantly correlated to the resulting discriminant function. The Mature Defense Style had a medium correlation with the Neurotic Defense Style, perhaps resulting in an insufficient amount of unique contribution from Mature Defense Style in the classification process. As has been

found in the previous literature, the Neurotic Defense Style was more representative of the anxious group and the Immature Defense Style was more representative of the depressed group.

Previous researchers have identified higher reliance on Mature (Flannery & Perry, 1990) and Neurotic Defense Styles (Andrews, Singh, & Bond, 1993; Kipper et al., 2004; 2005; Muris & Merckelbach, 1994; Nishimura, 1998; Spinhoven & Kooiman, 1997) for those with anxiety and higher reliance on Immature Defense Style for those with depression (Akkerman et al., 1992; 1999; Besser, 2004; Corruble et al., 2003; Flannery & Perry, 1990; Flett et al., 2005; Kennedy et al., 2001; Kneepkens & Oakley, 1996; Kwon 2000; Kwon & Lemon, 2000; McMahon et al., 2005; Milgrom & Beatrice, 2003; Mullen et al., 1999; Nishimura, 198; Oakley et al., 2005; Spinhoven & Kooiman, 1997). Notably, although some previous researchers (e.g., Gothelf et al., 1995) have indicated that all disorders share an elevated use of immature defenses, the Immature Defense Style in the present study was still important for differentiation. Although an elevated use of immature defenses may be characteristic of all disorders, it is seemingly even more characteristic of depression than of anxiety. In addition, similar to the results from the individual defenses, the discriminant function resulting from the self-report DSQ defense styles is more heavily weighted toward the anxiety-related defense styles than the depression related style.

With regard to differentiation between the two types of disorders previous researchers have found neurotic or midlevel defense styles (i.e., Self-sacrificing) to be higher in those with anxiety than the comparison group of those with depression (Kennedy et al., 2001; Spinhoven & Kooiman, 1997). While immature defenses have been found to be higher in both persons with depression and persons with anxiety, Bond (2004) argues that evidence suggests neurotic defenses (unlike mature or immature defenses) such as Reaction Formation, Pseudoaltruism, Primitive Idealization and Undoing are stable across pre- to post-treatment for depression. The present results confirm that elevated levels of neurotic defenses, might be an important way to differentiate those with anxiety from those with depression. Additionally, the present results suggest that although both depression and anxiety might be related to elevated use of immature defenses, it appears that those with depression may have even more elevated levels than those with anxiety.

Combined, the defense styles resulted in a correct classification of 64.8% of the anxious participants, 64.0% of the depressed participants and 64.7% of the participants overall. This percentage for each group as well as overall is the same percentage as was correctly classified

with the individual DSQ defenses. If this finding that defensive levels may correctly classify participants into depressed or anxious groups at the same rate as individual defenses, this may help to avoid some of the difficulties with reliability of individual defenses. However, as noted before the measures with the most difficulty with reliability of individual defenses tend to be observer report measures. Also, as was noted by the work of DeFife and Hilsenroth (2005) above, the defensive levels containing some of the key differentiating individual defenses are confounded by containing defenses with differing patterns of relations to depression and anxiety. More research is needed to understand the benefits and costs to using levels as opposed to individual defenses for differentiating between those with depression and anxiety. It is possible that this is less problematic in the defense levels of the DSQ than it is in those levels identified in the DMRS. Additionally, while the Defense-Q does not currently have defensive levels to assess, the individual defenses provided a higher rate of correct classification than either the defense styles or individual defenses on the DSQ.

Confirmatory Analysis 1 (Defense-Q Individual Defenses)

The first of the confirmatory analyses was intended to highlight which defenses from the Defense-Q best differentiated between the depressed and anxious groups. It was anticipated that the defenses that best differentiated would be the same defenses highlighted in the previous literature, and specifically the ones used in the first discriminant analysis in this study. Eleven of the 25 Defense-Q defenses were important for classification, including the four defenses from the first analysis (Acting Out, Turning Against Self, Projection, & Isolation), one defense that was hypothesized in the initial analysis but did not reach significance (Idealization), and six other defenses (Repression, Fantasy, Turning Against Others, Dissociation, Psychotic Denial, & Neurotic Denial).

Two of the 11 defenses (Idealization & Dissociation) were more representative of the anxiety group, while the remaining defenses were more representative of the depressed group. Of the seven other defenses found to differentiate in the stepwise discriminant analysis but not in the standard discriminant analysis, Turning Against Others and Psychotic Denial are not typically assessed by other defense measures. Additionally, although Dissociation has been found to be related to anxiety scores by other researchers (Holi et al., 1999) the conceptualization for Dissociation on the DSQ as well as on the DMRS is substantially different than the conceptualization of Dissociation on the Defense-Q. This makes it difficult to compare the

current findings to the limited previous findings about the relation of Dissociation to depression and anxiety. With regard to other defenses, however, persons with anxiety have been found to have elevated use of Idealization, (Kipper et al., 2005; Spinhoven & Kooiman, 1997; Watson, 2002), while those with depression have been found to have elevated use of Fantasy (Bronnec et al., 2005; Corruble et al., 2005; Holi et al., 1999; Watson, 2002), and Neurotic Denial (Bronnec et al., 2005; Corruble et al., 2005).

No research has previously found a relation between Repression and either depression or anxiety scores. This may be because the DSQ does not assess Repression, in part because of the previously mentioned difficulties with self-reporting an inability to remember something (Besser, 2004; Brody et al., 2003; Cooper et al., 1991; Cramer 1998a; 1998b; Joiner et al., 2000; Kwon, 1999; Norem, 1998; Skodol & Perry, 1993), which is a key component of the conceptualization or Repression. Although the DMRS does assess Repression, it is grouped in with Dissociation, Reaction Formation, and Displacement, all of which have been identified in the current research as defenses that are more associated with elevated levels of anxiety than of depression. This is another example of potential difficulties of attempting to differentiate between disorders based on defensive levels. In this case, while three of the defenses are primarily related to anxiety, the remaining defense is more related to depression.

As was mentioned earlier, defense mechanism measures sometimes conceptualize some defenses slightly differently. Although Devaluation and Passive Aggression have often been found to be frequently used defenses by those with depression, it was determined that the components of these two defenses that was accounting for the elevated use were the aspects of Turning Against Self that had been incorporated into their conceptualization. As would be expected, neither Devaluation nor Passive Aggression on the Defense-Q was indicated as an important defense in this stepwise analysis despite the discriminant function relying heavily on depression-related defenses. This, combined with the finding that Turning Against Self had the second highest standardized coefficient in the analysis, supports the theoretical argument that Turning Against Self is an important defense in understanding depression and it should be attended to when attempting to understand the defensive functioning of an individual with depression.

The stepwise analysis improved the classification rate somewhat over the initial hypothesized analysis for the Defense-Q. Combined, the defenses resulted in a correct

classification of 75.4% of the anxious participants, 73.7% of the depressed participants and 75.0% of the participants overall. As would be expected by adding more possible predictor variables and entering them based on maximizing the classification rather than on theory, this classification rate is slightly higher than was found in the hypothesized Defense-Q analysis. Although it correctly classified more participants, it only improved the overall classification rate by 3.6%, suggesting the originally hypothesized defenses from research and theory came close to maximizing the differentiation between the depressed and anxious groups.

Confirmatory Analysis 2 (DSQ Individual Defenses)

Unlike the previous confirmatory analysis, which produced a large number of individual defenses that contributed to the differentiation between the depressed and anxious groups, the second confirmatory analysis produced only five individual DSQ defenses that were important for classification. The initial three defenses from the previous DSQ individual defenses analysis (Reaction Formation, Undoing, & Isolation) were again important for differentiation, as were Sublimation and Suppression. Reaction Formation, Sublimation, and Undoing were all more representative of the anxious group and Isolation and Suppression were more representative of the depressed group.

Whereas the Defense-Q discriminant function was weighted toward depression-related defenses, the DSQ discriminant function was weighted toward anxiety-related defenses. This was true for both the hypothesized as well as the confirmatory analyses. Numerous reasons for this difference are possible. For example, it may be that observational measures better tap observable aspects of depression than anxiety, making the defenses related to depression more crucial to differentiating between the two. Similarly, the internal aspects of anxiety including worrying and mental ruminations might be more easily accessible via self-report, thus making these defenses more crucial for differentiating with self-report measures. Additional research is required to explain and explore the importance of this finding more fully.

Interestingly, although the two confirmatory analyses identified 16 defenses across the two measures that were important for differentiating between the depressed and anxious groups, only Isolation was identified across both measures using the standardized coefficients. On both the observer report Defense-Q and the self-report DSQ Isolation was used more frequently by those in the depressed group than those in the anxious group. This further supports the conclusion from the hypothesized analyses 1 and 2 that aspects of Isolation that are apparent to

both external observers as well as internally to the person are important to differentiating depression from anxiety.

Research related to Reaction Formation, Undoing, and Isolation was reviewed after Hypothesized Analysis 2. The two defenses that have been added to the differentiation (i.e., Sublimation & Suppression) are both considered mature defenses. Suppression has been found to be negatively related to depression (Bronnec et al., 2005; Milgrom & Beatrice, 2003; Muris & Merckelbach, 1994; Watson, 2002) and anxiety (Andrews, Singh, & Bond, 1993; Pollock & Andrews, 1989). Sublimation, on the other hand, has been found to be negatively related to both depression (Bronnec et al., 2005; Corruble et al., 2004) and anxiety (Andrews, Singh, & Bond, 1993; Pollock & Andrews, 1989), but has also been found to be *positively* related to anxiety (Kipper et al., 2004; 2005). Kipper and colleagues argued that their finding that patients with anxiety used Sublimation more than their control group was likely indicative of a greater usage of defenses overall compared to the people in the control group, who were not experiencing any psychological difficulties. In the present study, it may be that participants in the anxiety group are using Sublimation more often than their counterparts in the depressed group, but perhaps not more than persons with no psychological disorder. Regardless, it appears that higher scores on Sublimation and lower scores on Suppression are important for classifying participants in the anxious rather than depressed group. More research is warranted to clarify the inconsistent pattern of relations between anxiety symptomatology and mature defense mechanisms further. Research including a control group of psychologically healthy participants will assist in clarifying these relations.

Overall Summary of Study 2

As was mentioned previously, although there are numerous studies looking individually at defense use in either depression or anxiety, there is very limited research examining the differences in defense use between the two types of disorders. Research has previously demonstrated that those with depression score higher on Acting Out, Devaluation, Hypochondriasis, Isolation, Passive Aggression, Projection, and Projective Identification and score lower on Idealization, Reaction Formation, and Undoing than do persons with anxiety (Bloch et al., 1993; Busch et al., 1995, Spinhoven & Kooiman, 1997). The results of the current study also found Acting Out, Isolation, Projection, Idealization, Reaction Formation, and Undoing to be important when differentiating between the two types of disorders. The only two

defenses (excluding ones not assessed by either the Defense-Q or DSQ) that were previously found to be important in differentiating depression and anxiety and were not replicated on one of the measures in the present investigation were Devaluation and Passive Aggression. As was mentioned previously, these two defenses incorporate aspects of Turning Against Self when assessed on the DMRS, which was the measure used in that study. In the present research, Turning Against the Self was found to be important for differentiation using the Defense-Q.

In addition to the previously mentioned defenses, the confirmatory analyses highlighted several other defenses that may be important when differentiating depression from anxiety. Repression had not been found to be related to either depression or anxiety, but was heavily weighted (as representative of depression) in the discriminant function from the Defense-Q analysis. In addition, other defenses not previously found to differentiate between depression and anxiety were found to be important in the two analyses. Namely, Fantasy, Turning Against Others, Dissociation, Psychotic Denial, Neurotic Denial, Suppression, and Sublimation all warrant further investigation to examine the extent to which they contribute to the differentiation between depression and anxiety in other samples.

In terms of previous literature looking specifically at differences in defense level functioning between persons with depression and anxiety, the results of the present study are largely similar. Both studies using the DSQ (Spinhoven & Kooiman, 1997; Kennedy et al., 2001) found neurotic level defenses (i.e., Neurotic Defense Style & Self-sacrificing Defense Style) to be higher in those with anxiety than those with depression. Result from hypothesized analysis 3 similarly found Neurotic Defense Style to be the predominant predictor in differentiating between these two groups. Additionally, the current results identified the Immature Defense Style as an important predictor in group differentiation. This was not found in the aforementioned studies, but is consistent with the third study examining this area (i.e., Bloch et al., 1993), which used the DMRS. Bloch and colleagues found use of 3 of the 4 most maladaptive defense styles on the DMRS (i.e., Narcissistic, Disavowal, & Action) to be significantly higher in those with depression compared to those with anxiety.

Similarly, the results from hypothesized analyses 1 and 2 were largely consistent with the results from previous studies comparing persons with depression and anxiety. Spinhoven and Kooiman (1997) found higher scores on Isolation in the depression group and higher scores

Idealization in anxiety group using the DSQ. Hypothesized analysis 2 identified Isolation as an important predictor and Idealization had a structure coefficient of .49.

The observer report measures also performed similarly across the previous and current research. Only two of the six defenses (Acting Out & Projection) that were previously found to be different across groups were common between the DMRS and Defense-Q (Bloch et al., 1993). Both of these defenses were found to be important in the differentiation between these groups in hypothesized analysis 1. These two defenses were among the top three defenses in relative importance for differentiation with the Defense-Q, with the third defense being Turning Against Self. Turning Against Self is encompassed in Passive Aggression and Devaluation on the DMRS, both of which were also among the six defenses Bloch and colleagues found to be significantly different between those with depression and anxiety. Finally, Busch and colleagues (1995) also found Reaction Formation and Undoing to be higher in the anxiety group than the depression group using the DMRS. Although Reaction Formation had a structure coefficient of -.43, neither defense was considered important in the final differentiation between groups using the Defense-Q when looking at the standardized coefficients. This may have been partially attributable to the discriminant function of the Defense-Q being primarily weighted with depression-related defenses. The hypothesized analysis 2 with the DSQ was primarily weighted with anxiety-related defenses and included both of these defenses in the most important defenses for classification.

Overall the classification rates were roughly similar between observer and self-report measures, with observational measures perhaps having a slightly higher correct classification rate. Whether this is a function of observer report measures in general or of the Defense-Q in particular remains to be determined. Future research should include the DMRS as well to examine whether the extra time and training required for observationally assessing defenses is worth the resulting difference in correct classification rates[23].

Finally, since the time that the original literature review was completed and the hypotheses developed for the present study, a recent article was added to the PsychINFO search engine. Blaya and colleagues (2006) used a stepwise discriminant analysis to assess the extent to which defense mechanisms from the DSQ could be used to classify patients diagnosed with

[23] The interested reader is directed to Appendix K for a stepwise discriminant analysis including both Defense-Q and DSQ defenses.

either anxiety or depression correctly. After using the same cross-validation used in the present study, they found 63.9% of participants were correctly classified as controls, 53.6% were correctly classified as depressed, 21.2% were correctly classified in the social anxiety group, 43.0% in the panic disorder group, and 40.7% in the obsessive compulsive disorder group. With regard to individual defenses, Projection was the most characteristic defense for those in the Major Depressive Disorder group, Sublimation was the most characteristic defense for the Panic Disorder group, and Acting Out was the most characteristic defense for the Obsessive Compulsive Disorder group. Although a most characteristic defense was listed for each disorder, the authors note that "one anxiety disorder patient could hardly be differentiated from another" (p. 182).

Projection being related to depression and Sublimation being related to anxiety is consistent with the results of the confirmatory analyses in Study 2. However, the finding that Acting Out is the most characteristic defense for those with OCD is opposite to what would be expected from the results of the present study. Although Andrews, Singh, and Bond (1993) previously found those with OCD to have the highest scores on Acting Out among patients with Panic Disorder, Social Phobia, and OCD, no previous findings have indicated that Acting Out would be found to be more indicative of an anxiety disorder than of depression. Indeed, Bloch and colleagues (1993) found Acting Out to be an important *depression*-related defense in differentiating depression from anxiety. More research is needed to determine whether this finding regarding Acting Out is anomalous and perhaps attributable to the capitalization of chance differences that sometimes happens with a stepwise analysis, or whether Acting Out is more indicative of OCD than depression in some circumstances. Additionally, incorporation of an observer report measure would have helped to determine if the result that persons with anxiety disorders had largely similar defensive functioning was an artifact of the self-report assessment as previously hypothesized, or whether it represents actual similarities in persons with these disorders. Finally, this research added further support for a higher usage of some adaptive defenses (i.e., Sublimation) in persons with Panic Disorder than in control participants. Addressing the question of whether this is due to an overall increase in activation of defenses or a relative increased use of Sublimation remains unanswered. Future researchers should consider using a measure such as the Defense-Q that assesses relative use of defenses to clarify this continuing question in the literature.

General Discussion

Comparison Between Observer and Self-report

Taking the results of Study 1 and Study 2 together, the general theme is that there is a substantial difference between what is being assessed on observer and self-report measures of defenses. This is generally consistent with previous findings comparing the two types of measures, but is problematic for researchers wishing to combine findings from the literature across measures. In Study 1 there was little overlap between similarly named defenses when compared in the same sample. Moreover, differentiation between participants in the depression and anxiety groups in Study 2 resulted in only a single defense being common to both observer and self-report predictor variables. Despite the limited overlap, defenses from both the observer and self-report analyses were largely consistent with both theory and previous research combined from observer and self-report measures. This bolsters the argument above that, despite the limited overlap, both observer and self-report measures of defenses may be assessing different aspects of the same constructs. This conclusion supports the current trend in the literature to use multiple methods when empirically assessing defenses.

Can Defenses aid in the Differentiation of Depression and Anxiety?

In her seminal book on defenses, Anna Freud (1995) wrote that "there is a regular connection between particular neuroses and special modes of defense" (p. 34). Decades later this argument is still being investigated. In general, the results from the present study support Anna Freud's original argument. Defense mechanisms assessed through both observer and self-report can be used to classify participants into either the depressed or anxious group. Although this classification rate is significantly better than chance, approximately 25% of participants remained incorrectly classified even with the most accurate of the discriminant functions. Perhaps the standard of conducting assessment on defenses alone is too high to meet. Psychological assessment is a complex task, often requiring several sources of information, including interviews, observation, informant information, and self-report questionnaires. It may be that although decisions cannot be made on defensive functioning alone, they may be a useful addition to the list of other sources of information considered during assessments. The results of this study indicate that defenses can be useful in discriminating those with depression from those with anxiety, but the results further indicate that measurement issues across all measures will

need to be addressed before assessment at the individual defense level is reliable enough to warrant a prominent role in diagnosis.

Measurement Issues

Defense mechanisms have long been noted for their difficulty of being assessed. In their 1989 paper, Bond, Perry and colleagues noted that over more than a decade of trying to measure the "elusive" defense mechanism, substantial measurement error remained. Although improvements have been made to both Bond's DSQ and Perry's DMRS, both measures remain largely below the level of acceptable reliability at the individual defense level. With the DSQ, the movement beyond the 88-item version has improved psychometric properties somewhat, and this work continues with the emergence of even newer revisions of the DSQ (e.g., DSQ-60; Kramer et al., 2007; Trijsburg, Bond, Drapeau, Thygesen, & de Roten, 2005). The DMRS has also been revised several times since its inception, and new changes adding more defenses at the most pathological extreme as well as making the measure into a Q-sort measure more like the Defense-Q are underway (J. C. Perry, personal communication, March 20, 2008). Additionally, MacGregor, Olson, Presniak, and Davidson (2008) have recently revised the coding manual for the Defense-Q. While the revisions to the DSQ and DMRS have been more at the structural level, the Defense-Q revisions were focused on increasing clarity and ease of use of the measure. These improvements were specifically targeted at decreasing the measurement difficulties that have long been associated with defense assessment. Overall the predominant measures to assess defenses each fall short in terms of measurement issues when assessing individual defenses. Low reliability numbers makes understanding exactly what is being assessed a difficult question despite some convergence across the measures.

Limitations and Strengths

One of the limitations of Study 1 is that the DMRS was only coded by a single coder. While multiple people were brought in for training, only one coder successfully completed the training and coded the interviews using the DMRS. This is one of the limitations of observation defense research. It often takes considerable investment to get researchers trained to code defenses reliably. In the case of the present investigation, several attempts to train additional coders resulted in additional coders completing part, but not all of the training before discontinuing. Future comparisons between the DMRS and other defense measures would benefit from having several coders' scores combined as was done with the Defense-Q in the

present investigation or have several "consensus" profiles combined as has been described in other research (e.g., Perry, 1990; Perry & Henry, 2004). This would likely increase the reliability of the individual defenses and produce a more accurate defense profile.

Despite having three coders for the Defense-Q, the reliability of the individual defenses could be improved. Defenses for the participants in the current study were coded along with defenses for participants for other related studies. This may have resulted in coders being required to code hundreds of 15 minute interviews over the year. This is a substantial commitment to ask of volunteer research assistants in terms of time. Defense coding is a mentally taxing activity and coding large data sets may reduce the cognitive sharpness of the coder over long periods of coding. Coding smaller numbers of interviews may allow for more focus and perhaps more accuracy in the defense coding. As was mentioned above, the Defense-Q coding manual has been revised since the data were collected for this investigation (MacGregor et al., 2008). While conceptualizations and core of the measure remain largely unchanged, the manual has been expanded and reorganized in an attempt to improve reliability for the individual defense mechanisms. Other procedures, such as coding with previously constructed transcripts of the interviews have been incorporated to help reduce the load on the coder and allow them to focus more completely on the task at hand. It is hoped that these steps will improve reliability of individual defense mechanisms for future research.

A third limitation of the present study is that the sample is related to the generalizability of the findings. The sample was entirely university students and predominately Caucasian females. The decision to use a university sample not only restricts the range of severity of the disorders (i.e., the most severely depressed individuals might not be coming to school or not volunteering for research credit projects), but also restricts the age range of the participants. The extent to which the present results extend beyond a primarily female, Caucasian, late-teens or early-20s sample of university students remains to be seen. While the scores of the individuals do indicate they were experiencing psychological difficulties, further work on more diverse clinical and community samples would be beneficial. Moreover, while the results of numerous studies using the DSQ across several different countries (see Appendix A for list of countries) provide some convergent evidence of defensive functioning, the present research warrants replication across several other cultures. Results from Blaya and colleagues (2006) were comparable to

results from the present study, however, supporting the claim that the results may be generalizable to older samples of mental health patients in a Brazilian sample.

One of the biggest strengths of the present investigation is the scale on which it was conducted. Over 1000 students completed the psychological assessment measure with which the groups were formed. This allowed for using actual clinical cut-offs rather than merely elevated scores and allowed for discarding of any participants that were elevated on both depression and anxiety or who had suspect PAI profiles. Considering the comorbidity of the disorders, only a large scale project would allow for that degree of selectiveness. Additionally, the time required on the part of researchers to interview all the participants (5-7 interviewers), to code the interviews for attractiveness (2 coders) and defenses using the Defense-Q (3 coders) and the DMRS (1 coder) was extensive. The large scale of the investigation, however, was required to provide sufficient data to answer the research questions.

Additionally, the present investigation not only used multiple methods to assess defenses, it also addressed a long-standing gap in the literature by further investigating the relation among some of the most frequently used measures of defense mechanisms. It is curious how sparse the literature is investigating how these measures relate to each other, especially given that the few studies that have been published indicate that there are far more differences than there are similarities. The present investigation compared four defense measures to each other before moving to the important question of how useful defense mechanisms are in differentiating depression from anxiety. Although there have been numerous calls in the literature to use the multi-method approach to assessing defenses (Besser, 2004; Bond et al., 1989; Davidson & MacGregor, 1998; Offer et al., 2000), few recent studies have invested the resources to do it.

Finally, not only did the present study compare multiple methods of assessing defenses, it also included an important measure to rule out a possible confound. Although other authors (e.g., Davidson et al., 2004) have noted the possibility that the physical attractiveness of the participant might impact the coder's perception of the maturity of the participant's defense use, no authors have empirically investigated this possibility. The present research had independent coders rate the attractiveness of the participants and it was determined that the coders were assessing defenses free from bias related to the attractiveness of the participant. This was previously assumed but can now be stated with more confidence.

Future Directions

One important future direction for defense research is to examine how defense measures relate to each other further. The present study suggests that individual defense mechanisms on observer and self-report measures share little overlap on similarly named defenses. This is similar to previous research comparing the two types of measures (Bond et al., 1989). Further exploring these relations after addressing some compounding factors (e.g., reliability of individual defenses on observer report measures) will help to understand and interpret defensive functioning from various types of assessment better. Expanding this knowledge to other types of defense assessment (e.g., projective) is important. Research utilizing projective (e.g., Defense Mechanisms Manual & Rorschach Defense Scales), observer (e.g., Defense-Q & DMRS), and self-report (e.g., DSQ & DMI) measures of defenses together in a sample of control and clinical groups would greatly add to the understanding of how different defense measures relate to each other and would assist in interpreting the current body of literature.

Secondly, although the participants in the current investigation scored in the clinical range on the relevant PAI scales, replicating the investigation in a clinical sample is important. While convenient for research use, it is possible that university students reporting some symptomatology on a self-report measure may not have the same pattern of defensive functioning as patients seeking psychological services. Conducting the discriminant analyses in patients diagnosed with one type of disorder but not the other will either help to confirm the findings of the present investigation or to highlight potentially important differences between patients and university students endorsing symptomatology on a self-report measure. While Blaya and colleagues (2006) have completed some of this work with a self-report measure, replicating their work with an observer report measure as well will be important, especially considering the differences in results from the present study.

A final important area for future research is replicating the research design with other disorders. Depression and anxiety are only two of several groups of disorders that are difficult to differentiate in psychological assessments. Future work on disorders such as Axis II personality disorders will further elucidate how useful defenses are in the assessment of psychological disorders. In addition to investigating other disorders, separating anxiety disorders and examining the utility of defenses in differentiating within the anxiety disorder spectrum might help to clarify whether there are identifiably different defense profiles for different anxiety

disorders. Although Blaya and colleagues (2006) found little difference between these disorders on their recent research, adding an observational measure might help to clarify any differences between different anxiety disorders. This future research might extend the current design by using multiple groups including separate anxiety disorder groups and group of psychologically healthy individuals. To be maximally useful, clinicians would need to be able to differentiate between numerous types of psychological disorders based on defense mechanism profiles.

General Summary

Although the results from the present study confirm that mental disorders can be differentiated by examining the differences in defensive functioning, several points must be remembered. First, defense mechanisms are, as Spinhoven and colleagues (1995) put it, "elusive, complex, and subtle processes" (p. 133). Researchers and psychodynamic theorists cannot agree on the number of defenses that exist or agree on how to define certain defenses. Researchers and clinicians must be aware of the elusive nature of defenses and combine methods of assessing them to maximize the potential of getting a more complete understanding of a person's defensive functioning. Until such time as a consensus is reached on defense conceptualizations, it will be important for researchers and clinicians to pay attention to differences in which defenses are assessed by a measure (e.g., does the measure assess Turning Against Self if you are examining depression) as well as how those defenses are conceptualized.

If the Defensive Functioning Scale from the *DSM-IV-TR* moves from its status as a proposed axis for further study to full axis status, the DFS defense conceptualizations will be the clear favourite in conceptualizations for other measures to follow. The present study has added evidence that defenses can be useful in differentiating between similar mental disorders with numerous overlapping symptoms. This, combined with the emerging research on defenses in treatment of mental disorders, adds support to the role of defenses in understanding psychopathology. More research needs to be done to explore the role of defenses in assessment and treatment of mental disorders further, but the results of this and other studies demonstrate a promising groundwork from which to build.

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Appendix A

Supplementary information on DSQ versions used by referenced researchers.

Authors	Items	Defenses	Defense Styles	Language	Country
Akkerman et al., 1992	36	17	Mature, Neurotic, Immature	English	Australia
Akkerman et al., 1999	40	20	Mature, Neurotic, Immature	English	Australia
Albucher et al., 1998	88	24	Adaptive, Self-sacrificing, Image Distorting, Maladaptive	English	U.S.A.
Andrews, Page, et al., 1993	36	17	Mature, Neurotic, Immature	English	Australia
Andrews et al., 1989	88	25	Mature, Neurotic, Immature	English	Australia
Andrews et al., 1989	72	20	Mature, Neurotic, Immature	English	Australia
Andrews et al., 1989	36	17	Mature, Neurotic, Immature	English	Australia
Andrews, Singh, et al., 1993	72	20	Mature, Neurotic, Immature	English	Australia
Andrews, Singh, et al., 1993	40	20	Mature, Neurotic, Immature	English	Australia
Besser, 2004	36	17	Mature, Immature, Emotion Avoiding	Hebrew	Israel
Birmes et al., 2000	40	20	Mature, Neurotic, Immature	French	France
Blaya et al., 2006	40	20	Mature, Neurotic, Immature	Portuguese	Brazil
Bond et al., 1983	81	24	Adaptive, Self-sacrificing, Image Distorting, Maladaptive	English	Canada
Bond & Perry, 2004	88	24	Adaptive, Self-sacrificing, Image Distorting, Maladaptive	English	Canada
Bond et al., 1989	81	24	Adaptive, Self-sacrificing, Image Distorting, Maladaptive	English	Canada
Bond & Vaillant, 1986	81	24	Adaptive, Self-sacrificing, Image Distorting, Maladaptive	English	Canada
Brody et al., 2002	64	17	Distancing, Social Preservation, Internalizing, Impulsive Action-oriented	English	U.S.A.
Bronnec et al., 2005	40	20	Mature, Neurotic, Immature	French	France
Corruble et al., 2004	40	20	Mature, Neurotic, Immature	French	France
Corruble et al., 2003	40	20	Mature, Neurotic, Immature	French	France

Flannery & Perry, 1990	67	14	Mature, Self-sacrificing, Image Distorting, Maladaptive	English	U.S.A.
Flannery & Perry, 1990	88	20	Mature, Self-sacrificing, Goal-oriented, Image Distorting, Maladaptive	English	U.S.A.
Flett et al., 2005	40	20	Mature, Neurotic, Immature	Hebrew	Israel
Heldt et al., 2003	40	20	Mature, Neurotic, Immature	Portuguese	Brazil
Hoglend & Perry, 1998	88	24	ODF	Norwegian	Norway
Holi et al., 1999	72	20	Mature, Neurotic, Immature	Finnish	Finland
Kennedy et al., 2001	88	25	Adaptive, Self-sacrificing, Image Distorting, Maladaptive	English	U.S.A.
Kipper et al., 2004	40	20	Mature, Neurotic, Immature	Portuguese	Brazil
Kipper et al., 2005	40	20	Mature, Neurotic, Immature	Portuguese	Brazil
Kneepkens & Oakley, 1996	40	20	Mature, Neurotic, Immature	English	U.S.A.
Kwon, 2000	72	20	Mature, Neurotic, Immature	English	U.S.A.
Kwon & Lemon, 2000	72	20	Mature, Neurotic, Immature	English	U.S.A.
McMahon et al., 2005	40	17	Mature, Neurotic, Immature	English	Australia
Milgrom & Beatrice, 2003	40	18	Mature, Neurotic, Immature	English	Australia
Mullen et al., 1999	88	24	Adaptive, Self-sacrificing, Image Distorting, Maladaptive	English	U.S.A.
Mullen et al., 1999	88	24	ODF	English	U.S.A.
Muris & Merckelbach, 1994	36	17	Mature, Neurotic, Immature	Dutch	Netherlands
Muris & Merckelbach, 1996	36	17	Mature, Emotion Avoiding, Immature	Dutch	Netherlands
Nishimura, 1998	71	25	Mature, Neurotic, Immature	Japanese	Japanese
Oakley et al., 2005	40	20	Mature, Neurotic, Immature	English	U.S.A.
Perry & Hoglend, 1998	88	24	ODF (based on 88-item, 4 style system)	Norwegian & English	Norway & U.S.A.
Pollock & Andrews, 1989	72	20	Mature, Neurotic, Immature	English	Australia
Punamaki et al., 2002	40	20	Mature Reality-based, Conscious-limiting, Immature Reality-escaping, Immature Reality-distorting	Arabic	Palestine

Sammallahti et al., 1994	88	25	Mature, Neurotic, Inhibition, Immature	Finnish	Finland
Sammallahti et al., 1994	88	1	Combined psychopathology score	Finnish	Finland
Sammallahti et al., 1996	88	25	Mature, Neurotic, Borderline, Immature	Finnish	Finland
Spinhoven et al., 1995	36	17	Mature, Neurotic, Immature	Dutch	Netherlands
Spinhoven & Kooiman, 1997	36	17	Mature, Neurotic, Immature	Dutch	Netherlands
Trijsburg et al., 2000	42	1	ODF	Dutch	Netherlands
Wastell, 1999	37	24	Mature, Neurotic Affect-focused, Neurotic Content-focused, Immature Affect-focused, Immature Content-focused	English	Australia
Wastell, 1999	47	15	Mature, Neurotic Affect-focused, Neurotic Content-focused, Immature Affect-focused, Immature Content-focused	English	Australia
Watson, 2002	40	20	Mature, Neurotic, Immature	English	Canada
Yuan et al., 2002	88	24	Mature, Neurotic, Concealing, Immature	Chinese	China

Appendix B

Defense-Q Scoring Sheet

Coder ID number and name _____
Coder sex _____

Interviewer ID number _____
Interviewer sex _____

Participant ID number _____
Participant sex _____

Tape number _____

Instructions
Q-sort the 25 defense mechanisms into seven piles with 1, 2, 5, 9, 5, 2, 1, cards in each pile. The cards are sorted according to whether they are characteristic of the individual you are assessing. Once you are finished, record the number of the defense mechanisms in the appropriate spaces below the category headings.

Uncharacteristic	**Neither Characteristic nor Uncharacteristic**	**Characteristic**
Most (1), Quite (2)	(9)	Somewhat (5)
Somewhat (5)		Quite (2), Most (1)
___ ___ ___	___ ___ ___ ___ ___	___ ___ ___ ___ ___
___ ___ ___ ___ ___	___ ___ ___ ___	___ ___ ___

Next rate the individual's overall defensiveness, in terms of : 1) how effective the defenses are (in quelling anxiety), 2) the individual's need for defenses (i.e., how much unresolved anxiety is present), and 3) how active are the individual's defenses typically (i.e., is the person generally "defensive" or "non-defensive").

	Low			**Medium**			**High**
Typical effectiveness	1	2	3	4	5	6	7
Typical need for defenses	1	2	3	4	5	6	7
Typical activation	1	2	3	4	5	6	7

Indicate the degree of confidence you have in the accuracy of the ratings you made of this individual at this time.

	Low			**Medium**			**High**
Confidence in rating	1	2	3	4	5	6	7

Appendix C

Mean, standard deviation, range, and inter-rater reliability of Defense-Q scores (Study 1).

Defense-Q score	*M*	*SD*	Range	ICC
ADP Similarity Score	.43	.22	-0.22 – 0.78	.76
Acting Out	2.52	.82	1.00 – 5.00	.59
Devaluation	4.00	.87	2.33 – 6.00	.47
Displacement	3.73	.37	3.00 – 5.00	.07
Dissociation	3.89	.75	2.00 – 6.00	.54
Fantasy	3.96	.37	3.00 – 5.00	.40
Grandiosity	3.93	.91	2.00 – 6.67	.69
Humour	5.08	1.08	1.67 – 7.00	.79
Idealization	3.90	.49	2.67 – 5.00	.30
Identification	3.45	.86	1.50 – 6.00	.63
Intellectualization	2.93	.97	1.00 – 5.67	.68
Isolation	4.44	1.45	1.33 – 7.00	.80
Neurotic Denial	4.27	.99	2.00 – 6.67	.64
Passive Aggression	4.18	.87	2.33 – 7.00	.73
Projection	4.03	.44	3.00 – 5.33	.25
Pseudoaltruism	4.15	.91	1.67 – 6.00	.69
Psychotic Denial	2.18	.68	1.00 – 4.00	.38
Rationalization	5.28	.92	3.33 – 7.00	.66
Reaction Formation	3.72	.77	1.67 – 5.33	.66
Regression	4.44	.92	2.67 – 7.00	.70
Repression	4.49	1.16	2.00 – 7.00	.77
Splitting	3.40	.58	2.00 – 5.00	.17
Sublimation	4.20	.91	2.00 – 6.67	.71
Turning Against Others	4.65	.79	2.50 – 7.00	.65
Turning Against Self	4.43	.81	2.33 – 6.67	.53
Undoing	4.72	1.09	2.67 – 7.00	.76

Note. ICC = intraclass correlation coefficients. ICCs were conducted using a two-way random effects model. n = 129. Mean ICC = .57

Appendix D

Defense Mechanism Rating Scale scoring sheet

			Total #	Qual # & letter
7 *HIGH ADAPTIVE LEVEL[51-66]*				
Affiliation	(51)	Aff	_____	_____
Altruism	(53)	Alt	_____	_____
Anticipation	(55)	Ant	_____	_____
Self-assertion	(57)	SA	_____	_____
Humor	(59)	H	_____	_____
Self-observation	(61)	SO	_____	_____
Sublimation	(63)	Sub	_____	_____
Suppression	(65)	Sup	_____	_____
High Adapt _____ x 7 =_____				
6 *OBSESSIONAL [45-50]*				
Isolation	(45)	Iso	_____	_____
Intellectualization	(47)	Intel	_____	_____
Undoing	(49)	Undo	_____	_____
Obsession _____ x 6 =_____				
5 *OTHER NEUROTIC [36-44]*				
Repression	(36)	Rep	_____	_____
Dissociation	(38)	Diss	_____	_____
Reaction Formation	(41)	RF	_____	_____
Displacement	(43)	Displ	_____	_____
Other Neurotic _____ x 5 =_____				
4 *MINOR IMAGE-DISTORTING (Narcissistic)[30-35]*				
Devaluation of self	(30)	S-Dev	_____	
Devaluation of others	(30)	O-Dev	_____	_____
Idealization of others	(32)	O-Ideal	_____	
Idealization of self	(32)	S-Ideal	_____	_____
Omnipotence	(34)	Omnip	_____	_____
Minor Image _____ x 4 =_____				
3 *DISAVOWAL [22-27]*				
Neurotic Denial	(22)	Den	_____	_____
Projection	(24)	Proj	_____	_____
Rationalization	(26)	Rat	_____	_____
Disavow _____ x 3 =_____				
Fantasy [28-29]	(28)	Fan	_____	_____
Fantasy _____ x 3 =_____				
2 *MAJOR IMAGE DISTORTING (Borderline) [16-20]*				
Splitting (Others' Image)	(16)	Splt-O	_____	
Splitting (Self image)	(16)	Splt-S	_____	_____
Projective Identification	(19)	ProjId	_____	_____
Major Image _____ x 2 =_____				
1 *ACTION [7-14]*				
Acting Out	(07)	AO	_____	_____
Passive Aggression	(10)	P-Agg	_____	_____
Hypochondriasis (HRC)	(13)	HRC	_____	_____
Action _____ x 1 =____				

a. Sum of Defenses x Weights _____

b. Total # of Defenses _____

c. *Overall Defensive Functioning* (1=low, 7 = high) a/b = __.____

Appendix E

Mean, standard deviation, and range of DMRS weighted scores (Study 1).

DMRS score	*M*	*SD*	Range
ODF	5.18	0.54	3.50 – 6.50
High Adaptive	27.73	15.44	0.00 – 70.00
Obsessional	21.63	13.38	0.00 – 54.00
Other Neurotic	13.06	8.85	0.00 – 40.00
Minor Image Distorting	7.16	7.08	0.00 – 28.00
Disavowal	8.35	6.28	0.00 – 30.00
Fantasy sublevel	0.93	1.71	0.00 – 6.00
Major Image Distorting	0.11	4.46	0.00 – 2.00
Action	0.32	0.70	0.00 – 3.00

Note. DMRS = Defense Mechanism Rating Scales. Weighted score = number of times a defense in that level was coded as present multiplied by the weight of the level (e.g., High Adaptive = 7, Action = 1). Possible ODF scores range from 1 – 7. No inter-rater reliability scores were calculated because only 1 coder completed data collection. n = 129.

Appendix F

Mean, standard deviation, range, number of items, and internal consistency of DSQ scores (Study 1).

DSQ score	*M*	*SD*	Range	Items	IC
Overall Defensive Functioning	3.47	.33	2.82 – 4.48	72	.84
Mature Defense Style	58.15	9.06	35.00 – 82.00	10	.43
Neurotic Defense Style	73.11	14.69	32.00 – 106.00	16	.63
Immature Defense Style	166.67	36.89	84.00 – 258.00	46	.85
Acting Out	26.01	8.50	6.00 - 48.00	6	.66
Altruism	12.32	3.37	3.00 - 18.00	2	.30
Anticipation	11.37	3.38	3.00 - 18.00	2	.32
Autistic Fantasy	5.46	2.54	1.00 - 9.00	1	-
Denial	5.50	.24	2.00 - 13.00	2	-.20
Devaluation	12.16	3.78	3.00 - 23.00	3	-.04
Displacement	10.12	4.97	3.00 - 26.00	3	.23
Dissociation	10.04	4.74	3.00 - 24.00	3	.32
Humor	12.90	3.45	4.00 - 18.00	2	.51
Idealization	16.40	5.20	3.00 - 27.00	3	.33
Isolation	14.78	6.17	4.00 - 35.00	4	.43
Passive Aggression	31.97	7.61	1.00 - 52.00	8	.36
Projection	26.88	9.78	10.00 - 60.00	10	.73
Rationalization	4.36	2.31	1.00 - 9.00	1	-
Reaction Formation	33.46	9.29	15.00 - 56.00	8	.60
Somatization	8.74	4.41	2.00 – 18.00	2	.58
Splitting	10.65	4.59	3.00 - 22.00	3	.48
Sublimation	16.90	4.18	4.00 - 27.00	3	.24
Suppression	16.98	4.53	4.00 - 27.00	3	.26
Undoing	10.94	4.80	3.00 - 26.00	3	.42

Note. DSQ = Defense Style Questionnaire. IC = Internal consistency calculated with Chronbach's alpha. IC cannot be calculated for the Autistic Fantasy and Rationalization because they only contain 1 item. $n = 129$.

Appendix G

Mean, standard deviation, range, number of items, and internal consistency of DMI scores (Study 1).

DMI score	*M*	*SD*	Range	Items	IC
Overall Defensive Functioning	-34.68	25.48	-94.00 – 26.00	200	-
Principalization	43.90	6.47	30.00 – 60.00	40	.73
Reversal	38.76	8.00	16.00 – 62.00	40	.82
Turning Against Self	38.82	7.12	16.00 – 56.00	40	.77
Turning Against Other	39.38	9.74	17.00 – 62.00	40	.86
Projection	39.14	6.30	23.00 – 52.00	40	.70

Note. DMI = Defense Mechanisms Inventory. IC = Internal consistency calculated with Chronbach's alpha. IC cannot be calculated for the Overall Defensive Functioning scale because there is no variance in the total scores for a valid profile of all 200 items. $n = 129$.

Appendix H

Reliability of Defense-Q Individual Defenses for Study 2

Defense Mechanism	ICC for 3 coders
Acting Out	.72
Devaluation	.74
Displacement	.09
Dissociation	.15
Fantasy	.34
Grandiosity	.66
Humour	.66
Idealization	.46
Identification with the Aggressor	.68
Intellectualization	.66
Isolation	.55
Neurotic Denial	.60
Passive Aggression	.60
Projection	.44
Pseudoaltruism	.82
Psychotic Denial	.41
Rationalization	.46
Reaction Formation	.50
Regression	.58
Repression	.76
Splitting	.11
Sublimation	.59
Turning Against Others	.58
Turning Against Self	.67
Undoing	.60
Mean ICC	.54

Note. ICC = intraclass correlation coefficients. ICCs were conducted using a two-way random effects model.

Appendix I

Internal consistency of DSQ scores (study 2).

DSQ score	IC
Overall Defensive Functioning	.79
Mature Defense Style	.65
Neurotic Defense Style	.61
Immature Defense Style	.82
Acting Out	.72
Altruism	.41
Anticipation	.38
Autistic Fantasy	-
Denial	-.47
Devaluation	.24
Displacement	.29
Dissociation	.39
Humor	.64
Idealization	.27
Isolation	.50
Passive Aggression	.43
Projection	.67
Rationalization	-
Reaction Formation	.52
Somatization	.42
Splitting	.46
Sublimation	.34
Suppression	.30
Undoing	.62

Note. DSQ = Defense Style Questionnaire. IC = Internal consistency calculated with Chronbach's alpha. IC cannot be calculated for the Autistic Fantasy and Rationalization because they only contain 1 item. n = 116.

Appendix J

Corrected Versus Noncorrected Classification Rates for all Study 2 Analyses

	Corrected for Group Size			Uncorrected for Group Size		
Analysis	% correct anxious	% correct depressed	Total % correct	% correct anxious	% correct depressed	Total % correct
			Before Cross-validation			
Hypothesized #1	96.6	52.6	85.7	77.6	78.9	77.9
Hypothesized #2	97.8	28.0	82.8	70.3	64.0	69.0
Hypothesized #3	96.7	16.0	79.3	64.8	64.0	64.7
Confirmatory #1	94.7	68.4	88.2	84.2	84.2	84.2
Confirmatory #2	94.4	32.0	80.9	75.6	68.0	73.9
			After Cross-validation			
Hypothesized #1	84.5	31.6	71.4	72.4	68.4	71.4
Hypothesized #2	90.1	16.0	74.1	64.8	64.0	64.7
Hypothesized #3	95.6	16.0	78.4	64.8	64.0	64.7
Confirmatory #1	89.5	52.6	80.3	75.4	73.7	75.0
Confirmatory #2	94.4	32.0	80.9	72.2	68.0	71.3

Note. Hypothesized analyses refer to the first three analyses in Study 2, which were based on the defenses selected from the literature as most likely to differentiate between the depression and anxiety groups. Confirmatory analyses refer to the following stepwise analyses that were conducted to confirm whether those defenses initially selected from the literature were the defenses most important for differentiation between the groups.

Appendix K

Combination Defense-Q and DSQ stepwise discriminant analysis

	Standardized coefficient	Structure coefficient	Anxious group *M (SD)*	Depressed group *M (SD)*
Acting Out (1)	.70	.34	2.77 (0.98)	3.69 (1.33)
Reaction Formation (2)	-.62	-.38	35.86 (8.18)	28.21 (8.05)
Dissociation (2)	-.60	-.12	10.75 (5.21)	9.26 (4.66)
Suppression (2)	.55	.14	15.73 (4.63)	17.32 (4.32)
Turning Against Self (1)	.53	.16	4.46 (0.94)	4.84 (0.98)
Repression (1)	.49	.10	4.14 (1.21)	4.45 (1.37)
Reaction Formation (1)	-.46	-.26	3.76 (0.86)	3.20 (0.81)
Anticipation (2)	-.35	-.21	11.64 (3.51)	9.74 (4.05)
Passive Aggression (2)	.29	.10	37.02 (8.18)	39.05 (8.41)
Splitting (1)	-.25	-.10	3.50 (0.53)	3.38 (0.54)

Note. 1 = Defense-Q, 2 = Defense Style Questionnaire. The combined Defense-Q and DSQ stepwise discriminant analysis correctly classified 91.2% of anxious and 78.9% of depressed group members with an overall classification rate of 88.2%. After cross validation, 91.2% of anxious and 68.4% depressed participants remained correctly classified, with an overall classification rate of 85.5%.

Table 1

Comparison Table of Defense Mechanism Definitions

DEFENSE-Q	DMRS 5th ed.	DSM-IV-TR
Acting Out Acting Out is the process by which a person deals with emotional conflict or stress through potentially destructive actions where the negative consequences are not considered. The actions must be related to the conflict or stressor.	**Acting Out** The individual deals with emotional conflicts, or internal or external stressors, by acting without reflection or apparent regard for negative consequences.	**Acting Out** The individual deals with emotional conflict or internal or external stressors by actions rather than reflections or feelings. Defensive acting out is not synonymous with "bad behaviour" because it requires evidence that the behaviour is related to emotional conflicts.
Devaluation Devaluation is the process by which a person deals with emotional conflict or stress by attributing exaggerated negative qualities to the nonself object causing the conflict in order to mitigate the threat.	**Devaluation** The individual deals with emotional conflicts, or internal or external stressors, by attributing exaggeratedly negative qualities to oneself or others. Unlike reaction formation, devaluation may conceal admiration or positive feelings towards others.	**Devaluation** The individual deals with emotional conflict or internal or external stressors by attributing exaggerated negative qualities to self or others.
Displacement Displacement is the process by which a person deals with emotional conflict or stress by transferring anxiety-provoking feelings or responses for one object onto another object that is perceived as less threatening.	**Displacement** The individual deals with emotional conflicts, or internal or external stressors, by generalizing or redirecting a feeling about or a response to an object onto another, usually less threatening, object. The person using displacement may or may not be aware that the affect or impulse expressed towards the displaced object was meant for someone else.	**Displacement** The individual deals with emotional conflict or internal or external stressors transferring a feeling about, or a response to, one object onto another (usually less threatening) substitute object.

DEFENSE-Q	DMRS 5th ed.	DSM-IV-TR
Dissociation Dissociation is the process by which a person deals with emotional conflict or stress by temporarily breaking down the integration of the components of consciousness then detaching from and losing conscious contact with the environment and persons in the environment.	**Dissociation** The individual deals with emotional conflicts, or internal or external stressors, by a temporary alteration in the integrative functions of consciousness or identity.	**Dissociation** The individual deals with emotional conflict or internal or external stressors with a breakdown in the usually integrated functions of consciousness, memory, perception of self or the environment, or sensory/motor behaviour.
Fantasy Fantasy is the process by which a person deals with emotional conflict or stress by fantasizing or daydreaming, often as a substitute for relationships with others.	**Autistic Fantasy** The individual deals with emotional conflicts, or internal or external stressors, by excessive daydreaming as a substitute for human relationships, more direct and effective action, or problem solving.	**Autistic Fantasy** The individual deals with emotional conflict or internal or external stressors by excessive daydreaming as a substitute for human relationships, more effective action, or problem solving.
Grandiosity Grandiosity is the process by which a person deals with emotional conflict or stress by acting or thinking in a manner where exaggerated positive qualities or abilities are attributed to the self in an attempt to make the self superior to others.	**Omnipotence** Omnipotence is a defense in which the subject responds to emotional conflict or internal and external stressors by acting superior to others, as if one possessed special powers or abilities.	**Omnipotence** The individual deals with emotional conflict or internal or external stressors by feeling or acting as if he or she possesses special powers or abilities and is superior to others.
Humour Humour is the process by which a person deals with emotional conflict or stress by making light of, or emphasizing the amusing or ironic aspects of the situation.	**Humor** The individual deals with emotional conflicts, or internal or external stressors, by emphasizing the amusing or ironic aspects of the conflict or stressor.	**Humor** The individual deals with emotional conflict or internal or external stressors by emphasizing the amusing or ironic aspects of the conflict or stressor.

DEFENSE-Q	DMRS 5th ed.	DSM-IV-TR
Idealization Idealization is the process by which a person deals with emotional conflict or stress by ascribing exaggerated positive qualities to a nonself object related to the anxiety and then, through their association to this exaggeratedly positive object, they have an increase in self-esteem.	**Idealization** The individual deals with emotional conflicts, or internal or external stressors, by attributing exaggerated positive qualities to self or others	**Idealization** The individual deals with emotional conflict or internal or external stressors by attributing exaggerated positive qualities to others.
Identification With the Aggressor Identification With the Aggressor is the process by which a person deals with emotional conflict or stress by taking on the same characteristics of the nonself object causing the anxiety.		
Intellectualization Intellectualization is the process by which a person deals with emotional conflict or stress by using abstract thinking, language, and generalizations, thereby controlling or minimizing the related affect.	**Intellectualization** The individual deals with emotional conflicts, or internal or external stressors, by the excessive use of abstract thinking or generalizations to avoid experiencing disturbing feelings.	**Intellectualization** The individual deals with emotional conflict or internal or external stressors by the excessive use of abstract thinking or the making of generalizations to control or minimize disturbing feelings.

DEFENSE-Q	DMRS 5th ed.	DSM-IV-TR
Isolation Isolation is the process by which a person deals with emotional conflict or stress by separating affective processes from cognitive processes related to the impulse and then preventing conscious awareness of the affect related to the threatening ideas and cognitions.	**Isolation** The individual deals with emotional conflicts, or internal or external stressors, by being unable to experience simultaneously the cognitive and affective components of an experience, because the affect is kept from consciousness. In the defense of Isolation, the subject loses touch with the feelings associated with a given idea (e.g., a traumatic event) while remaining aware of its cognitive elements (e.g., descriptive details).	**Isolation of Affect** The individual deals with emotional conflict or internal or external stressors by the separation of ideas from the feelings originally associated with them. The individual loses touch with the feelings associated with a given idea (e.g., a traumatic event) while remaining aware of the cognitive elements of it (e.g., descriptive details).
Neurotic Denial Neurotic Denial is the process by which a person deals with emotional conflict or stress by not acknowledging consequences of the conflict or stressor that are apparent to most others, such as related affect, action, or intentions. The conflict or stressor is recognized but the consequences are not.	**Denial (Neurotic Denial)** The individual deals with emotional conflicts, or internal or external stressors, by refusing to acknowledge some aspect of external reality or of his or her experience that would be apparent to others. The subject actively denies that a feeling, behavioural response, or intention was or is not present, even though its presence is considered more than likely by the observer.	**Denial** The individual deals with emotional conflict or internal or external stressors refusing to acknowledge some painful aspect of external reality or subjective experience that would be apparent to others. The term psychotic denial is used when there is a gross impairment in reality testing.

DEFENSE-Q	DMRS 5th ed.	DSM-IV-TR
Passive Aggression Passive Aggression is the process by which a person deals with emotional conflict or stress by indirectly and unassertively expressing thoughts, words, or actions toward the object causing the conflict or stress. There is an overt appearance of general compliance or indifference masking a more covert resistance or disapproval.	**Passive Aggression (TAS)** The individual deals with emotional conflicts, or internal or external stressors, by indirectly, unassertively and often self-detrimentally expressing aggression toward others. There is a facade of overt compliance masking covert resistance toward others. Passive Aggression is characterized by venting hostile or resentful feelings in an indirect, veiled, and unassertive manner towards others. Includes "turning against the self".	**Passive Aggression** The individual deals with emotional conflict or internal or external stressors by indirectly and unassertively expressing aggression toward others. There is a facade of overt compliance masking covert resistance, resentment, or hostility. Passive aggression often occurs in response to demands for independent action or performance or the lack of gratification of dependent wishes but may be adaptive for individuals in subordinate positions who have no other way to express assertiveness more often.
Projection Projection is the process by which a person deals with emotional conflict or stress by falsely attributing their own distressing impulses to a nonself object.	**Projection** The individual deals with emotional conflicts, or internal or external stressors, by falsely attributing his or her own unacknowledged feelings, impulses, or thoughts to others.	**Projection** The individual deals with emotional conflict or internal or external stressors by falsely attributing to another his or her own unacceptable feelings, impulses, or thoughts.
Pseudoaltruism Pseudoaltruism is the process by which a person deals with emotional conflict or stress by helping others address an apparently similar conflict or stress rather than by helping oneself.	**Altruism** The individual deals with emotional conflicts, or internal or external stressors, by dedication to fulfilling the needs of others.	**Altruism** The individual deals with emotional conflict or internal or external stressors by dedication to meeting the needs of others. Unlike the self-sacrifice sometimes characteristic of reaction formation, the individual receives gratification either vicariously or from the response of others.

DEFENSE-Q	DMRS 5th ed.	DSM-IV-TR
Psychotic Denial Psychotic Denial is the process by which a person deals with emotional conflict or stress by breaking contact with and distorting external reality.	See Neurotic Denial	**Denial** The individual deals with emotional conflict or internal or external stressors refusing to acknowledge some painful aspect of external reality or subjective experience that would be apparent to others. The term psychotic denial is used when there is a gross impairment in reality testing.
Rationalization Rationalization is the process by which a person deals with emotional conflict or stress through distorted elaborations and explanations, which may be exaggerated.	**Rationalization** The individual deals with emotional conflicts, or internal or external stressors, by devising reassuring or self-serving but incorrect explanations for his or her own or others' behaviour.	**Rationalization** The individual deals with emotional conflict or internal or external stressors by concealing the true motivations for his or her own thoughts, actions, or feelings through the elaboration of reassuring or self-serving but incorrect explanations.
Reaction Formation Reaction Formation is the process by which a person deals with emotional conflict or stress by substituting opposite thoughts, feelings, or behaviours. The thoughts, feelings, or behaviours substituted may be either positive or negative.	**Reaction Formation** The individual deals with emotional conflicts, or internal or external stressors, by substituting behaviour, thoughts, or feelings that are diametrically opposed to his or her own unacceptable thoughts or feelings.	**Reaction Formation** The individual deals with emotional conflict or internal or external stressors by substituting behaviour, thoughts, or feelings that are diametrically opposed to his or her own unacceptable thoughts or feelings (this usually occurs in conjunction with their repression).
Regression Regression is the process by which a person deals with emotional conflict or stress by reverting to a previously developmentally appropriate way of responding.		

DEFENSE-Q	DMRS 5th ed.	DSM-IV-TR
Repression Repression is the process by which a person deals with emotional conflict or stress by expelling wishes, thoughts, or experiences from conscious awareness, although traces of the conflict may remain, such as related affect.	**Repression** The individual deals with emotional conflicts, or internal or external stressors, by being unable to be cognitively aware of disturbing wishes, thoughts, or experiences. In contrast to isolation, the affective component often remains in consciousness.	**Repression** The individual deals with emotional conflict or internal or external stressors by expelling disturbing wishes, thoughts, or experiences from conscious awareness. The feeling component may remain conscious, detached from its associated ideas.
Splitting Splitting is the process by which a person deals with emotional conflict or stress by compartmentalizing the related affect states, objects, feelings, cognitions, etc., into contradictory components and then failing to integrate the components into a complete and cohesive whole.	**Splitting** The individual deals with emotional conflicts, or internal or external stressors, by viewing himself or herself as all good or all bad, failing to integrate the positive and negative qualities of the self and others into cohesive images. Often the same individual will be idealized and devalued. In splitting of other's images (object images), the subject demonstrates that his views, expectations and feelings about others are contradictory and that he cannot reconcile ambivalent affects to form realistic and coherent views of others.	**Splitting** The individual deals with emotional conflict or internal or external stressors by compartmentalizing opposite affect states and failing to integrate the positive and negative qualities of the self or others into cohesive images. Because ambivalent affects cannot be experienced simultaneously, more balanced views and expectations of self or others are excluded from emotional awareness. Self and object images tend to alternate between polar opposites: exclusively loving, powerful, worthy, nurturant, and kind - or exclusively bad, hateful, angry, destructive, rejecting, or worthless.

DEFENSE-Q	DMRS 5th ed.	DSM-IV-TR
Sublimation Sublimation is the process by which a person deals with emotional conflict or stress by channelling feelings or impulses into socially acceptable and productive behaviours.	**Sublimation** The individual deals with emotional conflicts, or internal or external stressors, by channelling potentially maladaptive feelings or impulses into socially acceptable behaviour.	**Sublimation** The individual deals with emotional conflict or internal or external stressors by channelling potentially maladaptive feelings or impulses into socially acceptable behaviour (e.g., contact sports to channel angry impulses).
Turning Against Others Turning Against Others is the process by which a person deals with emotional conflict or stress by blaming a nonself object for the conflict or for the outcome of one's behaviour or actions.		
Turning Against Self Turning Against Self is the process by which a person deals with emotional conflict or stress by attributing exaggerated negative qualities to and blaming the self for the cause of the conflict or anxiety.	See Passive Aggression	
Undoing Undoing is the process by which a person deals with emotional conflict or stress by making amends for previous behaviour through verbal or behavioural negation, often via repetitive thoughts or actions that are directly or symbolically related to the conflict.	**Undoing** The individual deals with emotional conflicts, or internal or external stressors, by words or behaviour designed to symbolically make amends for or negate previous thoughts, feelings, or actions.	**Undoing** The individual deals with emotional conflict or internal or external stressors by words or behaviour designed to negate or make amends symbolically for unacceptable thoughts, feelings, or actions.

DEFENSE-Q	DMRS 5th ed.	DSM-IV-TR
	Suppression The individual deals with emotional conflict or internal or external stressors by voluntarily avoiding thinking about disturbing problems, wishes, feelings, or experiences temporarily.	**Suppression** The individual deals with emotional conflict or internal or external stressors by intentionally avoiding thinking about disturbing problems, wishes, feelings, or experiences.
	Hypochondriasis (HRC) Hypochondriasis involves the repetitious use of a complaint or series of complaints in which the subject ostensibly asks for help. However, covert feelings of hostility or reproach toward others are expressed simultaneously by the subjects rejection of the suggestions, advice, or help that others offer.	**Help-rejecting Complaining** The individual deals with emotional conflict or internal or external stressors by complaining or making repetitious requests for help that disguise covert feelings of hostility or reproach toward others, which are then expressed by rejecting the suggestions, advice, or help that others offer. The complaints or requests may involve physical or psychological symptoms or life problems.

DEFENSE-Q	DMRS 5th ed.	DSM-IV-TR
	Projective Identification In projective identification the subject has an affect or impulse that he or she finds unacceptable and projects onto someone else, as if it was really that other person who originated the affect or impulse. However, the subject does not disavow what is projected – unlike in simple projection – but remains fully aware of the affects or impulses, and simply misattributes them as justifiable reactions to the other person!	**Projective Identification** As in projection, the individual deals with emotional conflict or internal or external stressors by falsely attributing to another his or her own unacceptable feelings, impulses, or thoughts. Unlike simple projection, the individual does not fully disavow what is projected. Instead, the individual remains aware of his or her own affects or impulses but misattributes them as justifiable reactions to the other person. Not infrequently, the individual induces the very feelings in others that were first mistakenly believed to be there, making it difficult to clarify who did what to whom first.

Note: DMRS = Defense Mechanism Rating Scale; DSM-IV-TR = Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision. From "The Defense-Q: An idiographic Q-sort measure of defense mechanisms. A manual for clinicians and researchers. (2nd ed.)," by M. Wm. MacGregor, T. R. Olson, M. D. Presniak, & K. Davidson, 2008, unpublished manual, pp. 94-103. Adapted with permission of the authors.

Table 2
Defensive Levels of the DSQ-88, DSQ-72, DSQ-40, and DMRS

DSQ-88	DSQ-72 & DSQ-40	DMRS (5th edition)
Adaptive [a]	**Mature** [a]	**High Adaptive Level** [a]
Humor, Sublimation, Suppression [Affiliation, Anticipation]	Anticipation, Humor, Sublimation, Suppression	Affiliation, Altruism, Anticipation, Humor, Self-assertion, Self-observation, Sublimation, Suppression
Self-sacrificing [b]	**Neurotic** [b]	**Obsessional** [b]
(Pseudo)altruism, Reaction Formation [Denial*]	Idealization, (Pseudo)altruism, Reaction Formation, Undoing	Isolation, Intellectualization, Undoing
Image Distorting [b]		**Other Neurotic** [b]
Devaluation, Idealization, Omnipotence, Splitting [Denial*, Isolation, Projection*]		Displacement, Dissociation, Reaction Formation, Repression
Maladaptive [c]	**Immature** [c]	**Minor Image Distorting** [c]
Acting Out, Inhibition, Passive Aggression, Projection*, Regression, Withdrawal [Consumption, Fantasy, Help-Rejecting Complaining, Projective Identification, Somatization]	Acting Out, Denial, Devaluation, Displacement, Dissociation, Fantasy, Isolation, Passive Aggression, Projection, Rationalization, Somatization, Splitting	Devaluation (self), Devaluation (other), Idealization (self), Idealization (other), Omnipotence
		Disavowal [c]
		Neurotic Denial, Projection, Rationalization
		Major Image Distorting [c] **(Borderline)**
		Splitting (self), Splitting (other), Projective Identification
		Action [c]
		Acting Out, Hypochondriasis (Help-rejecting Complaining), Passive Aggression

Note. DMRS = Defense Mechanism Rating Scale; DSQ = Defense Style Questionnaire. Defensive levels with the same superscript are considered to be at the same level of personality organization (Bond, 2004; Perry & Ianni, 1998). DSQ-88 defenses in square brackets are not included in the DSQ defense style from Bond et al., 1983, but have some items scored in the four broad defense styles in the DSQ Manual (Bond & Wesley, 1996). DSQ-88 defenses marked with an asterisk appear on multiple defense styles. Rationalization was added to the DSQ-40 but is not represented on the DSQ-72. Although it was originally scored in the Immature Defense Style, recent articles (e.g., Blaya et al., 2006) have moved Rationalization to the Mature Defense Style.

Table 3

Pearson r Values Between Defense-Q and DSQ

Defense style	Defense-Q ADP Similarity Score
DSQ Immature	**-.26****
DSQ Neurotic	.01
DSQ Mature	**.23****
DSQ ODF	**.37*****

Note. ADP = Adaptive Defense Profile; DSQ = Defense Style Questionnaire; ODF = Overall Defensive Functioning scale. n = 129 for all cells.

* = $p < .05$; ** = $p < .01$; *** = $p < .001$.

Table 4

Correlations Between Similarly Named Defense-Q and DSQ Individual Defenses

DSQ defense / Defense-Q defense	*r* value
Acting Out / Acting Out	**.33*** **
Altruism / Pseudoaltruism	.16
Autistic Fantasy / Fantasy	.08
Denial / Neurotic Denial	.15
Devaluation / Devaluation	.03
Displacement / Displacement	.09
Dissociation / Dissociation	.06
Humor / Humour	.16
Idealization / Idealization	.04
Isolation / Isolation	.16
Passive Aggression / Passive Aggression	-.02
Projection / Projection	-.01
Rationalization / Rationalization	**.22***
Reaction Formation / Reaction Formation	**.30****
Splitting / Splitting	.05
Sublimation / Sublimation	**.20***
Undoing / Undoing	.02

Note. DSQ = Defense Style Questionnaire. $n = 129$ for all cells.

* = $p < .05$; ** = $p < .01$; *** = $p < .001$

Table 5

Pearson r Values for Defense Levels and ODF of Various Defense Measures

Defense level/style	Defense-Q ADP SS	DSQ ODF	DSQ Mature	DSQ Neurotic	DSQ Immature
DMRS ODF	**.24****	.05	.04	.10	.01
DMRS High Adaptive	**.26****	-.01	.05	-.03	.01
DMRS Obsessional	.04	.05	-.15	-.12	-.10
DMRS Other Neurotic	-.08	-.03	-.08	-.05	.03
DMRS Minor I/D	.05	-.12	.03	-.04	.14
DMRS Disavowal	.08	.05	-.03	-.10	-.13
DMRS Fantasy sublevel	**-.21***	-.02	-.05	-.02	-.07
DMRS Major I/D	.00	.00	.02	.03	-.04
DMRS Action	**-.25****	-.14	-.12	-.10	.13
DMI ODF	.11	**.37*****	**.35*****	.09	**-.27****
DMI Principalization	.16	**.30****	**.31*****	.11	**-.21***
DMI Reversal	.04	**.35*****	**.31*****	.06	**-.26****
DMI Turning Against Self	-.15	.06	-.13	**.28****	-.11
DMI Turning Against Other	-.01	**-.35*****	**-.22***	**-.25****	**.30****
DMI Projection	-.03	**-.28****	**-.23***	-.13	**.20***

Note. ADP SS = Adaptive Defense Profile Similarity Score; DMI = Defense Mechanisms Inventory; DMRS = Defense Mechanism Rating Scale; DSQ = Defense Style Questionnaire; I/D = Image Distorting; ODF = Overall Defensive Functioning scale. $n = 129$ for all cells.

* = $p < .05$; ** = $p < .01$; *** = $p < .001$

Table 6

Pearson r Values for Defense-Q Scores and General Physical Attractiveness

Defense-Q score	General Physical Attractiveness
ADP Similarity Score	.05
Acting Out	.08
Devaluation	.04
Displacement	-.01
Dissociation	-.14
Fantasy	-.09
Grandiosity	.10
Humour	-.05
Idealization	.00
Identification	.03
Intellectualization	-.07
Isolation	.01
Neurotic Denial	-.02
Passive Aggression	.08
Projection	.04
Pseudoaltruism	-.16
Psychotic Denial	.01
Rationalization	-.05
Reaction Formation	.04
Regression	.11
Repression	.00
Splitting	.05
Sublimation	.00
Turning Against Others	.15
Turning Against Self	-.07
Undoing	-.07

Note. $n = 111$.

* = $p < .05$; ** = $p < .01$; *** = $p < .001$

Table 7

Pearson r Values for DMRS scores and General Physical Attractiveness

DMRS level	General Physical Attractiveness
DMRS ODF	.17
DMRS High Adaptive	-.05
DMRS Obsessional	-.01
DMRS Other Neurotic	-.01
DMRS Minor I/D	-.10
DMRS Disavowal	-.18
DMRS Fantasy sublevel	-.15
DMRS Major I/D	-.08
DMRS Action	-.03

Note. DMRS = Defense Mechanism Rating Scale; I/D = Image Distorting; ODF = Overall Defensive Functioning scale. $n = 111$ for all cells.

* = $p < .05$; ** = $p < .01$; *** = $p < .001$

Table 8

Coefficients, Means and Standard Deviations for Hypothesized Analysis 1 (Defense-Q Defenses)

Defense-Q defense	Standardized coefficient	Structure coefficient	Anxious group *M (SD)*	Depressed group *M (SD)*
Acting Out	.85	.62	2.76 (0.97)	3.69 (1.33)
Turning Against Self	.67	.27	4.48 (0.98)	4.84 (0.98)
Projection	.46	.16	3.91 (0.50)	4.03 (0.47)
Isolation	.32	.27	4.06 (1.28)	4.54 (1.33)
Reaction Formation	-.25	-.43	3.73 (0.88)	3.20 (0.81)
Splitting	-.18	-.18	3.51 (0.53)	3.38 (0.54)
Undoing	-.08	-.23	4.73 (1.05)	4.38 (1.24)
Idealization	.05	-.27	3.84 (0.53)	3.62 (0.69)
Displacement	-.01	.16	3.78 (0.44)	3.89 (0.62)

Note. Mean scores for all defenses range from 1 (least characteristic defense) to 7 (most characteristic defense). Defenses are arranged by descending absolute value of the standardized coefficients.

Table 9

Correlations of Defense-Q Individual Defenses (Study 2, Hypothesized Analysis 1)

	A/O	Disp.	Ideal	Isolation	Projection	R/F	Splitting	TAS	Undoing
A/O	--	.18	**-.44*** **	-.01	-.18	**-.43*** **	-.09	-.21	-.17
Disp.		--	-.12	-.20	.21	-.20	.10	-.01	-.16
Ideal.			--	**-.27***	.04	.10	.06	.12	-.01
Isolation				--	.00	-.08	-.06	.00	**-.26***
Projection					--	-.10	.06	-.14	-.01
R/F						--	-.02	.22	**.26***
Splitting							--	.00	.05
TAS								--	.14
Undoing									--

Note. A/O = Acting Out; Disp. = Displacement; Ideal. = Idealization; R/F = Reaction Formation; TAS = Turning Against Self. $n = 77$ for all cells.

* = $p < .05$; ** = $p < .01$; *** = $p < .001$

Table 10

Coefficients, Means, and Standard Deviations for Hypothesized Analysis 2 (DSQ Defenses)

DSQ defense	Standardized coefficient	Structure coefficient	Anxious group *M (SD)*	Depressed group *M (SD)*
Reaction Formation	.75	.71	36.51 (8.17)	30.00 (8.44)
Isolation	-.53	-.38	14.93 (6.69)	17.64 (5.35)
Undoing	.36	.28	13.91 (5.68)	12.20 (4.80)
Idealization	.22	.49	16.78 (4.99)	14.04 (5.41)
Passive Aggression	-.16	-.22	36.54 (8.73)	38.60 (7.78)
Devaluation	-.15	-.05	13.35 (4.06)	13.60 (5.17)
Displacement	-.14	-.31	11.91 (5.60)	13.76 (4.09)
Projection	.10	-.24	32.15 (9.90)	34.64 (7.75)
Splitting	.09	-.16	12.08 (4.77)	12.92 (4.65)
Acting Out	-.05	-.18	29.82 (8.99)	31.64 (9.01)

Note. DSQ = Defense Style Questionnaire. Mean scores for defenses vary according to the number of items tapping the defense and are not directly comparable between defenses. Higher scores indicate more frequent use of the defense. Defenses are arranged by descending absolute value of the standardized coefficients.

Table 11

Correlations of DSQ Individual Defenses (Study 2, Hypothesized Analysis 2)

	A/O	Dev.	Disp.	Ideal.	Isolation	P/A	Projection	R/F	Splitting	Undoing
A/O	--	**.20***	**.20***	**.24****	.12	**.54*****	**.35*****	-.12	**.35*****	.18
Dev.		--	-.05	-.03	**.24****	.14	**.36*****	**.22***	**.30****	.09
Disp.			--	-.15	.16	**.25****	.17	-.15	.05	.03
Ideal.				--	-.10	.02	-.12	**.31****	.09	.15
Isolation					--	**.27****	**.35*****	.06	**.29****	**.24****
P/A						--	**.33*****	-.03	**.27****	**.26****
Projection							--	**-.19***	**.30****	**.25****
R/F								--	-.10	.08
Splitting									--	.13
Undoing										--

Note. A/O = Acting Out; Dev. = Devaluation; Disp. = Displacement; DSQ = Defense Style Questionnaire; Ideal = Idealization; P/A = Passive Aggression, R/F = Reaction Formation. $n = 119$ for all cells.

* = $p < .05$; ** = $p < .01$; *** = $p < .001$

Table 12

Coefficients, Means and Standard Deviations for Hypothesized Analysis 3 (DSQ Defense Styles)

Defense style	Standardized coefficient	Structure coefficient	Anxious group *M (SD)*	Depressed group *M (SD)*
Neurotic	.96	.91	80.12 (13.87)	67.64 (13.28)
Immature	-.43	-.31	189.54 (36.69)	199.52 (31.32)
Mature	.00	.36	57.25 (11.40)	53.16 (10.68)

Note. DSQ = Defense Style Questionnaire. Mean scores for defense styles vary according to the number of items tapping the defense style and are not directly comparable between defense styles. Higher scores indicate more frequent use of the defense style. Defense styles are arranged by descending absolute value of the standardized coefficients.

Table 13

Correlations of DSQ Defense Styles (Study 2, Hypothesized Analysis 3)

Defense style	Mature	Neurotic	Immature
Mature	--	**.39*** **	-.04
Neurotic		--	.07
Immature			--

Note. DSQ = Defense Style Questionnaire. n = 119 for all cells.

* = $p < .05$; ** = $p < .01$; *** = $p < .001$

Table 14

Coefficients, Means, and Standard Deviations for Confirmatory Analyses (Defense-Q & DSQ Defenses)

Defense mechanism	Standardized coefficient	Structure coefficient	Anxious group *M (SD)*	Depressed group *M (SD)*
		Defense-Q		
Acting Out	1.07	.43	2.73 (0.95)	3.69 (1.33)
Turning Against Self	.88	.17	4.49 (0.99)	4.84 (0.98)
Repression	.70	.10	4.17 (1.23)	4.45 (1.37)
Idealization	.57	-.19	3.85 (0.53)	3.62 (0.69)
Fantasy	.49	.25	3.99 (0.37)	4.20 (0.50)
Turning Against Others	.43	.14	4.45 (0.76)	4.68 (0.80)
Dissociation	-.42	-.11	3.90 (0.75)	3.73 (0.78)
Isolation	.40	.19	4.03 (1.26)	4.54 (1.33)
Projection	.38	.10	3.92 (0.51)	4.03 (0.47)
Psychotic Denial	.37	.13	2.14 (0.71)	2.34 (0.67)
Neurotic Denial	.30	.13	4.08 (0.98)	4.36 (0.97)
		Defense Style Questionnaire		
Reaction Formation	.67	.63	36.79 (8.40)	30.00 (8.44)
Suppression	-.48	-.27	15.86 (4.80)	17.48 (4.00)
Sublimation	.44	.46	17.14 (4.25)	14.56 (4.71)
Isolation	-.43	-.37	14.60 (6.67)	17.64 (5.35)
Undoing	.41	.23	13.83 (5.77)	12.20 (4.80)

Note. DSQ = Defense Style Questionnaire. Mean scores for defenses vary according to the number of items tapping the defense and are not directly comparable. Higher scores indicate more frequent use of the defense. Defenses are arranged by descending absolute value of the standardized coefficients.

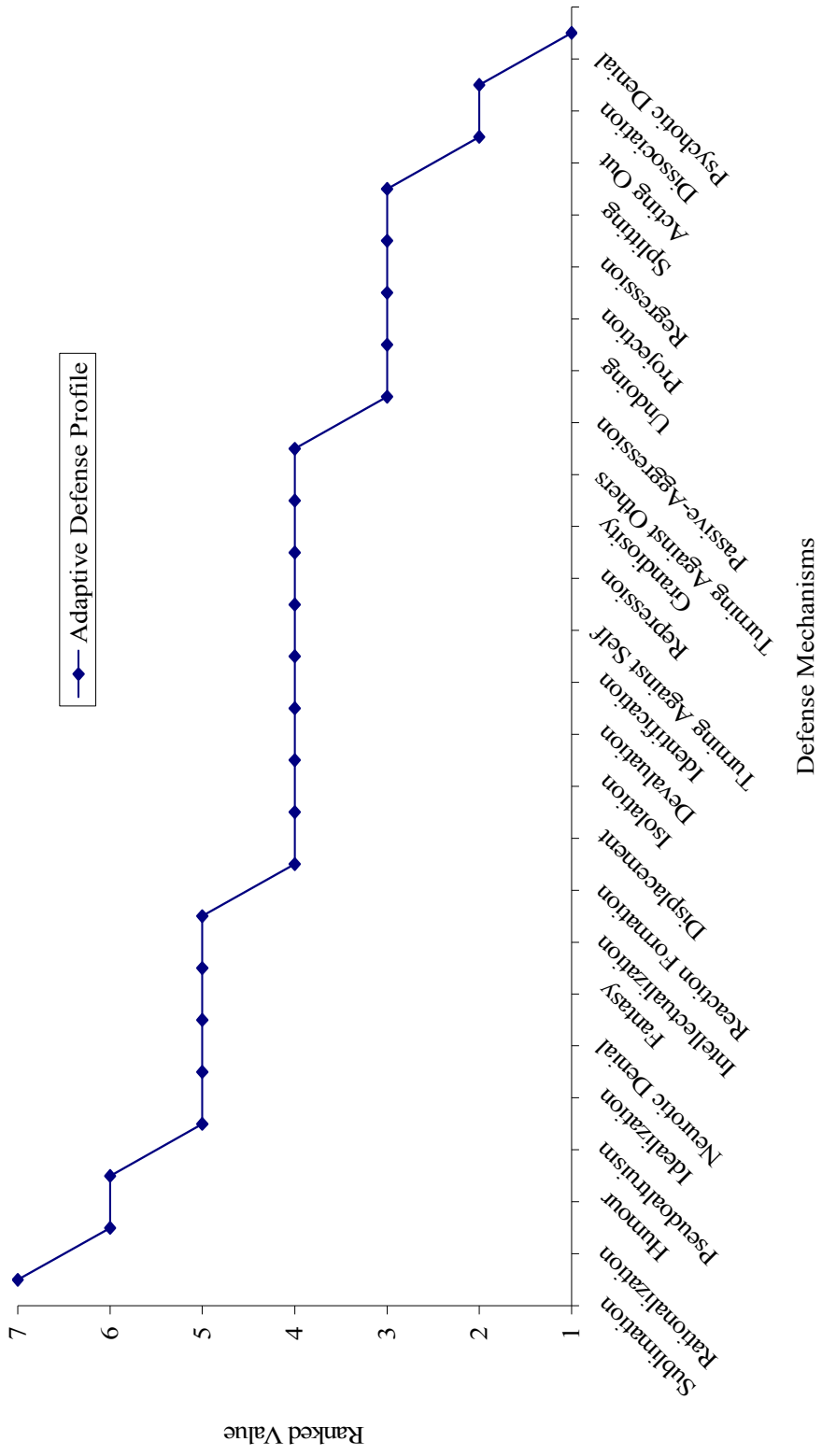

Figure 1. Theoretically Adaptive Defense Profile for the Defense-Q.

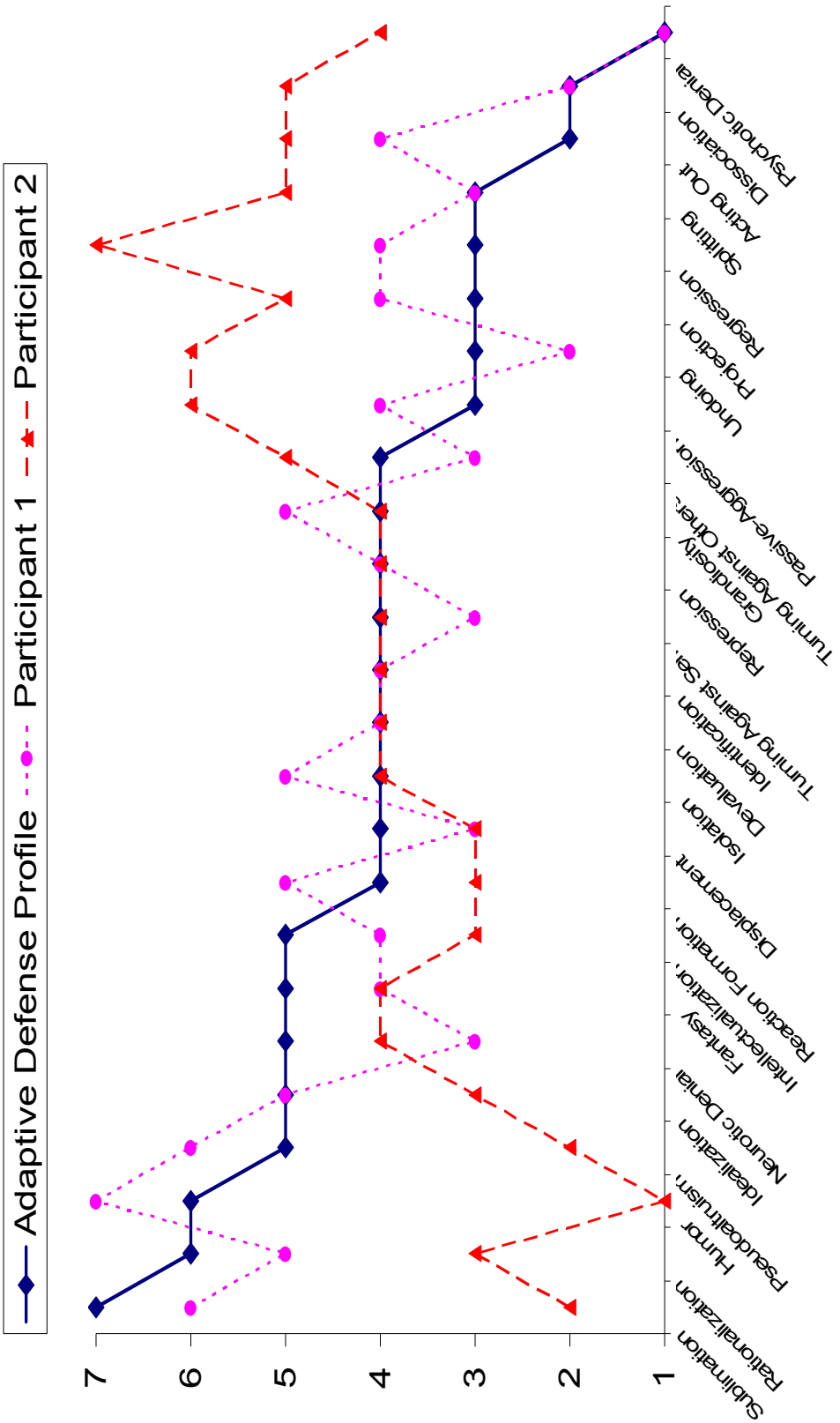

Figure 2. Example participant Defense-Q profiles compared to the Adaptive Defense Profile.