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Relationships between a quaternary model of psychological type processes and defense mechanism clusters

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**RELATIONSHIPS BETWEEN A QUATERNARY MODEL OF
PSYCHOLOGICAL TYPE PROCESSES AND
DEFENSE MECHANISM CLUSTERS**

by

Kathryn Elizabeth Kelly, M.A.

**A Dissertation Presented in Partial Fulfillment
of the Requirements for the Degree
Doctor of Philosophy**

**COLLEGE OF EDUCATION
LOUISIANA TECH UNIVERSITY**

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We hereby recommend that the dissertation prepared under our supervision
by Kathryn E. Kelly

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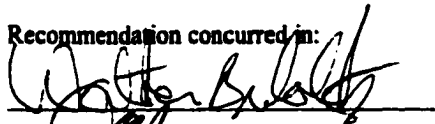
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ABSTRACT

This study examined the relationships between two psychological type dimensions (Extraversion-Introversion and Thinking-Feeling) and defense mechanism preferences. Psychological Type Theory was used as a conceptual framework for the generation of hypotheses. Specific hypotheses between the two psychological type dimensions and defense mechanism preferences were tested. Further, Extraversion-Introversion and Thinking-Feeling were combined, resulting in the formation of a quaternary personality model consisting of four groups (Introverted Thinking, Introverted Feeling, Extraverted Thinking, and Extraverted Feeling). Hypotheses that certain quaternary groups would display specific relationships with defense mechanism preferences were tested. To test hypotheses, 223 university students were administered the Myers-Briggs Type Indicator measure of psychological type and the Defense Mechanisms Inventory measure of defensive preference. Although some modest support for hypotheses was found (e.g., the Introverted Thinking group preferred Principalization defenses and the Extraverted Feeling group preferred Reversal defenses), on the whole, there was little support for the hypothesized relationship between the two psychological type dimensions and defensive preferences.

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CHAPTER 1

INTRODUCTION

Statement of the Problem

Defensive processes are central constructs in psychoanalytic personality theories, such as Freudian psychoanalysis and Jungian analytical psychology. One reason for the centrality of defensive processes in Freud and Jung is that these theories originated in the clinical setting and attempted to explain the mental processes of patients displaying psychopathological symptoms. In fact, one can argue that the central concepts of Freudian psychoanalytic theory originated in Freud's formulation of the role of the defense mechanism of repression in hysteria, as documented in the classic publication "Studies in Hysteria" (Breuer & Freud, 1909). The role of various other defense mechanisms was further developed both by S. Freud and by A. Freud (Freud, A., 1937/1966).

Jung elaborated his theory of personality, analytical psychology, upon the basic framework of Freudian psychoanalytic theory. Defensive processes are a core part of Jung's analytical psychology, as illustrated by the central role of such basic processes as repression, projection, and complex formation (Rychlak, 1981). Some of Jung's concepts are controversial (e.g., archetypes, collective unconscious) and have generated little empirical research. However, Jung's Psychological Type Theory, the aspect of analytical psychology that explains individual differences, has generated a large corpus

of theory and research in the mainstream of personality. Psychological Type Theory is even represented by its own journal, the *Journal of Psychological Type*, and by several organizations (e.g., Center for Applications of Psychological Type, Association for Psychological Type). Further, the Myers-Briggs Type Indicator is one of the most widely used personality assessment instruments worldwide (Carskadon, 1999; Keirsey, 1998).

Given the central role of defensive processes in the psychoanalytic theories of Freud and Jung and given the fact that Psychological Type Theory is an elaboration upon this psychoanalytic foundation, it is surprising that there is virtually no research concerning the relationship between psychological type and defense mechanisms. The goal of the present study is to address this lack of theory and research concerning relationships between Psychological Type Theory and defense mechanisms. The study will use a theoretical model to link psychological type processes to defensive processes and then empirically test this theoretical model. The problem is to test whether there are predictable relationships between preference for certain Jungian psychological type processes and the preference for defense mechanisms.

Although many have contended that "normal" and "abnormal" lie on the same continuum (Costa & McCrae, 1988), much theory and research have focused on either normal or abnormal personality functioning. Therefore, there has been little crossover in theory and research. The tradition of theory and research concerning Psychological Type Theory (Jung, 1921/1990), particularly the Myers-Briggs operationalization of type theory (Myers, I. S., 1993), emphasizes the assessment of normal, adaptive personality processes and functioning. The psychoanalytic theory of defense

mechanisms, including its operationalization by the Defense Mechanisms Inventory (DMI; Ihlevich & Gleser, 1993a), one of the most widely used and accepted paper-and-pencil self-report measures of defense mechanisms, originated in the tradition of abnormal psychology and psychopathology.

Both psychological type processes and defense mechanisms are considered relatively automatic, unconscious aspects of personality (Rychlak, 1981). Psychological Type Theory describes fundamental processes that are embedded in human consciousness and that operate at both conscious and unconscious levels. These fundamental processes include forms of attention, perception, cognition, and organization. Defense mechanisms can be viewed as unconscious, automatic mental transformations performed by these very same processes of attention, perception, cognition, and organization. Therefore, knowledge of psychological type preferences is expected to allow prediction of the kinds of defense mechanisms preferred. Indeed, it could be contended that defensive operations are a subset of the more general psychological type processes.

Therefore, one goal of this research was to integrate two relatively independent traditions in personality theory and research: (1) the tradition of investigating "normal" personality functioning, as reflected in Jungian Type Theory (Jung, 1921/1990) and its elaborations by Myers and Briggs (Myers, I. S., 1993) and (2) the tradition of investigating "abnormal" personality functioning, as reflected in the psychoanalytic theory of defense mechanisms (Freud, A., 1937/1966; Freud, S., 1894/1962) and its elaborations by Ihlevich and Gleser (1993a). More specifically, this research proposed a theoretical model linking specific psychological type processes to certain defense

mechanism preferences and then empirically tested the predicted relationships between preference for certain psychological type processes and preference for certain defense mechanisms.

Research Need

Individuals often seek out treatment when they experience life difficulties. These life difficulties can be manifested in cognitive, affective, and/or behavioral domains. Appropriate psychological treatment (i.e., counseling and psychotherapy) may focus on cognitive, affective, or behavioral interventions. For example, the therapist can adjust maladaptive thinking through cognitive therapy, ameliorate troubling affect through various therapeutic measures, and use behavioral techniques to correct maladaptive, unhealthy behavior (Kimble, 1999). Each of these treatment strategies, whether focused on cognitive, affective, or behavioral interventions, attempts to change the individual's characteristic pattern of thoughts, feelings, and behaviors that persist over time and situations. These characteristic patterns distinguish one person from another and form the basis of the individual's personality.

Information about the relationships between personality and defense mechanism preferences of normal persons would be useful for mental health professionals. For example, information about psychological type and defense mechanism preference could allow the therapist to anticipate and deal effectively with the kinds of defenses typically used by particular clients. This information could be invaluable in assisting the client and therapist in dealing with threatening material or resistances, in enhancing the therapist's understanding of clients, and in enhancing the client's self-understanding.

Ultimately, greater understanding could translate into greater therapeutic effectiveness. Defense mechanisms are traditionally related to abnormal personality (Cramer, 1998). It would be helpful to understand further the link between defense mechanisms and normal personality. Specifically, such knowledge would (1) increase the understanding of the relationship between normal and abnormal personality; (2) provide evidence for theory building by bridging the theoretical gap between abnormal and normal personality (e.g., defense mechanisms may become more useful in explaining normal behavior); (3) increase the understanding of personality disorders by determining the practicality of viewing personality disorders on a continuum; (4) help people with relationships by determining which personality types are more likely to use certain defense mechanisms, thereby increasing the effectiveness of communication; and (5) help motivate the client to seek treatment. The more explanation psychologists can offer for the thoughts, feelings, and behaviors of individuals, the more credibility psychology has as a science. Ultimately, a more credible science will lead to better motivation and efficacy for the client in a treatment setting. What follows is a review of the theories and research concerning psychological type processes and defense mechanisms.

Review of the Literature

Psychological Type

Jung (1921/1990) proposed that individuals do not behave randomly, but perceive and make judgments based upon their patterns of mental processes or psychological preferences. According to Jung, one's temperament is determined by the integration of three inborn bipolar psychological type processes: (1) preference for

where attention is naturally focused (i.e., preference for extraversion versus introversion); (2) preference for how information is acquired (i.e., preference for sensing versus intuitive perception); and (3) preference for how decisions are made (i.e., preference for thinking versus feeling judgment). Although each person uses both attitudes (extraversion and introversion) and all four functions (sensing, intuition, thinking, and feeling), Jung contends that each person has an inborn preference for one process in each dipole and that optimal development consists of developing one's natural preferences (while not neglecting one's less preferred processes). Jung's theory of psychological type has been conceptualized as a universal model of "normal" or "healthy" personality (Murray, 1990). These psychological type processes (i.e., extraversion, introversion, sensing, intuition, thinking, and feeling) will be fully discussed in the next sections.

All of the psychological type processes originate in unconsciousness (Jung, 1921/1990). However, the preferred functions naturally begin to differentiate in consciousness more than the less preferred functions. According to Jung, psychological type preferences are unconscious and inherited. One cannot just "decide" to change one's type (e.g., change from introverted to extraverted) although one can consciously choose to act in a more or less introverted or extraverted way in a particular situation. Jung (1921/1990) went so far as to suggest physiological differences between the two types and indicated that a reversal of type (i.e., falsification of type) can lead to extreme exhaustion or neurosis.

Overview of Psychological Type Theory

According to the Myers-Briggs interpretation of Psychological Type Theory (Myers & McCaulley, 1985), each individual has an inborn preference for one pole of each of four bipolar personality processes. These four bipolar personality preferences concern a person's preferred (1) Attitude, i.e., direction of attention (extraversion-introversion), (2) Perceiving process, i.e., preferred way of obtaining information (sensing-intuition), (3) Judging process, i.e., preferred method of making decisions (thinking-feeling), and (4) Orientation toward the external world (judging-perceiving).

Consistent with Jung (1921/1990), Myers and McCaulley (1985) also theorize that each person has an inborn preference to use and develop more fully one of the two processes constituting each bipolar preference dimension. However, each person uses all processes defining each of the four bipolar preference dimensions (i.e., sometimes a person functions in an extraverted way, sometimes in an introverted way, etc.).

The preferred attitude, extraversion (E) or introversion (I), concerns the person's primary direction of attention and interest. An extravert's attention and interest are primarily directed toward the outer, external world of people and objects. Extraverts tend to be energized by interacting with people and may be stressed by extended solitary activities. By contrast, an introvert's attention and interest naturally tend toward the inner, subjective world. Introverts may experience their inner world as more compelling than the external world. Introverts tend to be energized by solitary activities and often find extended or intensive social interaction stressful (Myers & McCaulley, 1985).

The preferred perceiving function, sensing (S) or intuition (N), represents the person's preferred method of gathering information. Sensing is a realistic, fact-oriented, practical form of perception that is associated with effective observation and recall of details. Those who prefer intuition, on the other hand, tend to be more speculative and imaginative and tend to perceive relationships and possibilities implied by events rather than seeing only the facts themselves (Jung, 1921/1990).

The preferred judging function, thinking (T) or feeling (F), concerns the preferred method of making decisions. Thinking emphasizes non-personal, decision-making based on objective, logical criteria while feeling is associated with decision-making based on subjective values (e.g., How will a decision affect interpersonal harmony?) (Jung, 1921/1990).

The final type dimension concerns the preference for using either a judging process (either thinking or feeling) or a perceiving process (either sensation or intuition) in the external world. Judging (J) is associated with a tendency to organize and control the outer world decisively. Conversely, perceiving (P) is associated with a more open, adaptable, information-gathering orientation toward the outer world. A judging orientation is associated with a preference for a planned, orderly approach to completing tasks whereas a perceiving orientation is associated with an ability to adapt to situations. The combination of preferences for attitude (extraversion or introversion), perceiving process (sensation or intuition), judging process (thinking or feeling), and outer world orientation (judging or perceiving) determine the person's whole psychological type, which can be one of 16 possible combinations (e.g., ISTJ, ESTJ, etc.) (Myers & McCaulley, 1985).

Jung never explicitly defined the JP dimension. The theoretical model of psychological type was expanded upon by Isabel Briggs Myers who added the JP dimension (Myers & McCaulley, 1985). The JP dimension describes a person's preferred orientation (i.e., engagement style) toward the external world. Judging is associated with a preference for engaging the external world by ordering, structuring, and controlling it. Conversely, perceiving is associated with engaging the outer world with an orientation that is open and adaptable. The JP dimension not only adds an extraverted, behavioral component to type theory, it also allows one to infer the dominant (most preferred), auxiliary (second most preferred), tertiary, and least preferred among the four functions. To summarize, perception determines what people see in a situation, and judgment determines what they decide to do about it (Myers, I. B., 1995).

Definitions of Extraversion and Introversion. The two attitudes (i.e., the preferred direction of attention), extraversion and introversion, complement each other, providing a psychic balance. One tends to be dominant and thus conscious; the other is used less and is unconscious. Introverts tend to focus on the self and to gain energy from solitary activities while extraverts tend to gain energy from interacting with people or events in the outer world. The extravert's natural focus is on the external world while the introvert tends to focus naturally on an internal, subjective reality. In addition, extraverts tend to perceive the outside world in a concrete fashion (i.e., black and white) with clear boundaries between objects and events. Introverts, by contrast, tend to view the world through a lens which casts shades of gray upon their reality. Such people experience the boundaries between objects and events as more permeable

than do extraverts (Jung, 1921/1990). Although individuals use both introversion and extraversion, they have an inborn preference for one of the two attitudes and, therefore, tend to use and rely on one attitude more than the other attitude. This notion of natural preference can be explained by using an analogy to handedness. While most people have an ability to write with either hand, a marked preference will be shown for one hand over the other. The use of the dominant hand is experienced as natural and easy while the use of the nondominant hand is experienced as unnatural and difficult.

Definitions of Sensing and Intuition. Sensing refers to the perceiving process of gathering information through the senses, (e.g., seeing and hearing to determine what is happening). Intuition refers to an unconscious way of perceiving information gleaned from unique perceptions and imaginings. A person with a greater preference for sensing than for intuition is also affected by the attitude of extraversion or introversion. An extraverted sensing type tends to be the most concrete of types. This type often sees no need for reflection and accepts the world the way it is. The introverted sensing type sees that same object in the world as the extraverted sensing type, but sees it through a unique subjective lens, often leading to a unique interpretation. At times this person seems to be using defenses to defend against the realities of the external world, just as the extraverted sensing type might appear to be defending himself or herself from the inner world.

Intuition is also a form of perception, but it is the perception of something psychic or outside of conscious awareness. The process may be as unmythical as envisioning the inherent possibilities of a situation or reading into what is seen (Rychlak, 1981). An extraverted intuiting type has been compared to a butterfly. He or

she will flit here and there, from one attractive flower to an adjacent flower that seems even more attractive, never satisfied for more than a fleeting moment. This person tends to be enthusiastic and verbal about his or her latest interest, whether it be a love interest, a career interest, or a social cause. Though often leaders in society, extraverted intuiting types may be left with a hollow experience of life (Jung, 1921/1990). The introverted intuitive type perceives unconscious images, which may or may not be prompted by external objects. These images receive more attention than the original object; they are studied and analyzed as though they were real. These people often appear a mystery to other types.

Definitions of Thinking and Feeling. Thinking refers to the process of making objective decisions based on universal rules and principles whereas feeling refers to the process of making decisions based on one's values and a concern for the feelings of others (Jung, 1921/1990). Thinking refers to a rational, objective function or cognitive process. One's mode of thinking depends upon whether the person is introverted or extraverted (Jung, 1921/1990). The extraverted thinking type uses external data to interpret his or her world in an objective fashion, as, for example, mathematicians typically tend to do (Jung, 1921/1990). The introverted thinker also gathers facts from the external world, but the mode of interpretation is colored by the individual's unique perceptions (Jung, 1921/1990). An example of this personality type might be an inventor. An inventor builds upon what is known in the world to create something new that he or she has conceptualized.

According to type theory, feeling is not an emotion, but rather a judgment of worth, value, or significance from a subjective viewpoint (Jung, 1921/1990); thus,

feeling is as rational a function as thinking. In contrast to the thinker, a feeler “knows” by means of a subjective evaluation rather than by means of a deliberate cognitive process. An extraverted feeling type favors making judgments of value, but his or her criterion is the external world and its accepted standards of judgment. The introverted feeling type, in contrast, makes value judgments, but his or her criterion tends to be subjective (Jung, 1921/1990).

Definitions of Judging and Perceiving. Jung’s Psychological Type Theory was expanded upon by Isabel Briggs Myers (Myers, I. S., 1993). She added a fourth dimension, judging versus perceiving, that Jung never explicitly defined. Judging versus perceiving describes a person’s preferred orientation toward the external world. Judging refers to the preference for controlling one’s life through planning and scheduling activities and making quick decisions while striving for closure. Perceiving, in contrast, refers to the preference for flexibility, openness, and spontaneity, ultimately allowing the individual to leave his or her options open. Those with a perceiving preference enjoy beginning tasks, as opposed to task completion. They are described as curious, spontaneous, and flexible (Keirsey & Bates, 1984). This dimension adds to Jung’s theory a behavioral type component as well as a way to determine the dominant, auxiliary, tertiary, and least preferred functions.

The Jungian Function Types and the Quaternary

According to Jung’s Psychological Type Theory, there are eight function types (IS, IN, IT, IF, ES, EN, ET, and EF). The function type is defined as the combination of the preferred attitude (E or I) with the dominant function (S, N, T, or F). Although Jung proposes eight function types, four function types, known as the quaternary (Doyle,

1999), will be used as the theoretical framework in this research. The quaternary model was selected because the two constituent dimensions (EI and TF) appear particularly relevant to defensive functioning. The four function types that comprise the quaternary (ET, EF, IT, IF) will be discussed in detail.

Introverted Feeling (IF) Quaternary Type. The IF type strives to protect and nurture his or her intense inner emotional life (Myers, I. B., 1995). This individual looks inside himself or herself using a subjective criterion for a sense of value and for ideals, such as love and loyalty (Jung, 1921/1990). Anything deemed unacceptable because it does not meet this internal criterion is simply ignored. As IF type individuals take a firm stance only on those issues deemed important by them, those individuals may be seen, even by themselves, as indecisive and lacking in conviction (Quenk, 1993a). For this IF type, the attentional preference is directed introvertedly, toward a subjective, inner world that emphasizes the personal experience of affects. If this preference were exaggerated, as in a crisis, the individual would be expected to experience self-directed negative emotions. The IF type typically copes by directing negative feelings toward the self, including self-blame, self-directed anger, and depression. The IF type would tend to attribute the locus of personal problems to the self (introverted direction) and engage emotions (feeling preference) in defensive operations under slight or moderate stress. In a severe crisis, the IF type may no longer accept and withhold judgment; instead, they project their own incompetencies upon others by becoming irritated and critical of others' perceived incompetencies (Quenk, 1993a).

Introverted Thinking (IT) Quaternary Type. The IT type gathers facts from the external world, but the mode of interpretation is colored by the individual's unique internal meaning (Jung, 1921/1990). The IT type has a tendency to force facts to agree with his or her beliefs, sometimes selecting only those facts that agree with his or her beliefs (Myers, I. B., 1995). The abstract idea is the decisive factor, and the agreeing objective facts are used to substantiate the idea. IT types tend to deal with most of life using a detached, objective approach (Quenk, 1993a). The IT type tends to apply logical, objective thinking to his or her inner world. Thus, because of the objectivity and detachment that characterizes thinking, this type would be expected to cope by analytically splitting affect from thoughts. The IT type would tend to attribute problems to the self or internalize problems (introverted direction), but would tend to apply objective, detached thinking to these problems (e.g., separating affects from cognitions). This type would be expected to be able to talk objectively about conflictual personal issues with minimal expression of affect. When in a severe crisis, the introverted thinker may have difficulty holding back anger. He or she tends to lash out at others, whether in a physical attack (e.g., breaking things) or in a verbal attack (e.g., being sarcastic and accusatory).

Extraverted Feeling (EF) Quaternary Type. The EF type is the most positive of types in terms of natural social interest (Adler, 1964). They tend to relate to others easily, forming harmonious relationships and exhibiting feelings of goodwill (Myers, I. B., 1995). They rarely hurt others and spend much of their time attending to the needs of others (Quenk, 1993a). EF types make judgements of value, but their criterion is the external world and its accepted ideals, conventions, and customs. In a slight to moderate

crisis, these types tend to direct their emotions and affects extravertedly. When in a crisis that does not activate their inferior function, the extraverted feeling types respond to otherwise naturally negative events in a positive or neutral fashion. Those preferring this defense deal best with short-term trials and tribulations but have difficulty with long-term situations, such as a chronic illness. Prolonged stressful situations, that would normally require them to confront and solve problems tax their typical short-term, Pollyanna-type reactions. When in a crisis, the extraverted feeling type tends to become depressed, withdrawn, and uncharacteristically pessimistic. When in a severe crisis, they become physically agitated, sarcastic, and even cruel toward other people (Quenk, 1993a).

Extraverted Thinking (ET) Quaternary Type. ET types use external data to interpret their world in an objective manner. Their internal interpretations are unimportant in light of their focus on concrete sense perceptions and their interest in the solving of practical problems (Myers, I. B., 1995). They value being respected over being liked and enjoy making decisions and being in charge. Emotions are unimportant in both themselves and others (Quenk, 1993a). This type would tend to try to force the outer world to conform to their wishes, thus directing aggression outwardly to achieve their goals. When in a severe crisis and a situation in which they experience emotions, the ET type may be unable to communicate what is to them a feeling of losing control and going crazy (Quenk, 1993a). This lack of coping ability may overwhelm the person to the point of becoming clinically depressed, leading to hospitalization and medication. They may even be in danger of becoming suicidal (Quenk, 1993a). However, in a crisis

that does not engage their inferior function, the ET types are quite adept, often taking charge and communicating a sense of calmness and confidence.

History of Personality Theories Supporting the Quaternary

This section will provide a historical review demonstrating substantial support for the validity of two primary dimensions from psychological type theory, EI and TF, and their combination into a quaternary model. Both of these two type dimensions (EI and TF) and their combination into a quaternary model (i.e., IF, IT, EF, ET) will be used as the theoretical foundation for this research.

As summarized by Doyle (1999) and others, the ancient Greeks defined personality in terms of a small number of stable, opposing qualities. In 450 BC, Empedocles identified four elements in his explanation of the world: fire, earth, air, and water. Hippocrates contended that there are four basic types of temperament and that each can be accounted for by a coexisting and predominant body fluid or "humor." His four temperaments were placed on a continuum from hot and cold to moist and dry. Hot temperaments resulted from fire and air; dry temperaments resulted from fire and earth; moist temperaments resulted from water and air; and cold temperaments resulted from water and earth. Galen further expanded Hippocrates' theory into human temperaments connected with humors. When the humors were in balance, the person exhibited an ideal personality; however, a humoral imbalance resulted in one of the following temperaments:

Blood: sanguine temperament (i.e., optimistic, cheerful)

Black bile: melancholic temperament (i.e., sad, sorrowful, pessimistic)

Phlegm: phlegmatic temperament (i.e., sluggish, apathetic)

Yellow bile: choleric temperament (i.e., irritable, angry)

As early as the Greek philosopher, Hippocrates, the idea that the foundation of temperament (i.e., the inherited foundation for personality) is composed of two pairs of opposing qualities has been accepted by many. When these two pairs of bipolar qualities are graphically represented, a quaternary model, consisting of four quadrants, is produced (Doyle, 1999). The four temperaments from humoral psychology appear to form a quaternary model in which the sanguine temperament corresponds to the combined characteristics of extraversion and feeling (EF), the melancholic temperament corresponds to introversion and feeling (IF), the phlegmatic temperament corresponds to introversion and thinking (IT), and the choleric temperament corresponds to extraversion and thinking (ET).

The importance of the ancient Greek contribution is fivefold: (1) it was the earliest Western conceptualization of personality, (2) it originated the notion that personality is defined by a limited number of stable qualities, (3) it assumed that these qualities are opposites, (4) it assumed that balance of the qualities must be achieved for psychological health, and (5) it assumed that humans are affected by both physiological and environmental factors, leading to the premise that humans are biopsychosocial (Doyle, 1999).

William James (1890/1950) coined the terms “toughminded” and “tenderminded” to describe a basic personality dimension that closely corresponds to Jung’s thinking versus feeling dimension. The choleric and phlegmatic temperaments both seem to share characteristics of James’ “toughminded” dimension while the

sanguine and melancholic temperaments both seem to share characteristics of James' "tenderminded" dimension.

Eysenck (1953) came to similar conclusions about the foundation of personality. Eysenck's bipolar Extraversion Factor is defined by behavior that is social, extraverted, and gregarious at one pole and by behavior that is quiet, untalkative, and uncommunicative at the other pole. According to Eysenck's Neuroticism factor, an individual tends toward either optimistic, assured, steady, and confident affects or toward melancholic, doleful, and self-pitying affects. Thus, Eysenck's psychometrically derived model is also consistent with a quaternary model of personality based on two bipolar dimensions, extraversion versus introversion and thinking versus feeling.

Furthermore, the notion of a personality quaternary was expanded upon by Cloninger (1991) who proposed that neurochemical processes cause people to view, experience, and evaluate the world differently. He asserted that temperament is inherited, shows up early in life, and leads to habits. Cloninger's model also overlays and corresponds to Jung's model and to the quaternary model, providing yet further support for Jung's model and support for the predictions of this paper. It is interesting to note that both Eysenck's (1994) Three-factor Model and Costa and McCrae's (1992) Big Five Model include an EI dimension and an emotionality component that appears similar to TF (Neuroticism and Agreeableness respectively).

Personality Traits Versus Personality Types

Personality characteristics can be conceptualized as either traits or types. Trait psychology and type psychology represent two reasonable but very different approaches to personality psychology. A trait model assumes that (1) the attribute is universal, with

each individual differing as to how much of that trait he or she possesses (e.g., introversion or creativity), (2) there is a value attached either to having or not having the trait, and (3) traits are normally distributed in the population (Quenk, 1993b). Unlike the trait model, the type model assumes that (1) type dimensions are not universal, (2) there are two distinct types of people best characterized by each end of a bipolar dimension, (3) there is no normal or best type to be, and (4) types approximate a bimodal distribution and are not normally distributed in the population.

Despite these distinctions, type dimensions (such as extraversion and introversion) are usually thought of and treated as a trait. Costa and McCrae's model as measured by the NEO-PI (Costa & McCrae, 1988) is best acknowledged as the current representation of the trait approach. Their five-factor model labels personality on five dimensions: Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism, each having an implicit negative pole (Carless, 1999).

The purpose of this section was to illustrate the historical relevance of the EI and TF components of Jung's theory used in this paper. In summary, it is clear that numerous models of personality proposed through history underlie EI and TF and underlie the quaternary model, which is based on the combination of EI and TF.

A Review of Relevant Psychological Type Research with the MBTI

In the twenty years from 1979-1999, 345 original studies on psychological type were published in the *Journal of Psychological Type* alone (Carskadon, 1999). Over 1500 studies of the Myers-Briggs Type Indicator (MBTI) were included in the MBTI manual (Myers & McCaulley, 1985). Numerous books about psychological type and its applications have been published (i.e., Keirsey, 1998; Keirsey & Bates, 1984; Quenk,

1993a). Although there is a plethora of research about psychological type, only those studies directly relevant to the present research will be discussed in detail. To discuss all the literature about psychological type, even the most recent studies, is beyond the scope of this paper.

Considerable psychological type research has an applied focus and is concerned with applications in education and business. Educators primarily use the MBTI to assess learning styles and to attempt an integration of learning styles with teaching styles (Barrett, 1989; Melear & Alcock, 1999). They also use the MBTI to assist in career choice (Kreienkamp & Luessenheide, 1985). The MBTI has also been extensively used in the managerial and industrial realms, primarily for the prediction of career success, job satisfaction, and decision-making (Hughes, Mosier, & Hunt, 1981; Johnson, 1992). Jamison and McGlothlin (1973) went so far as to compare MBTI scores with driving records, finding that safe drivers score higher on judging.

Because of the tendency of those using the MBTI to investigate domains of normal psychological and behavioral functioning, there is a dearth of research concerning psychological type and psychopathology. Much of the research with clinical samples has investigated the relationships between particular psychological types and certain disorders. For example, Bisbee, Mullaly, and Osmond (1982) administered the MBTI to 372 psychiatric patients and found that I, S, T, and J types were overrepresented; schizophrenics were mostly ISFJ types and ISTJ types whereas depressed patients were ISFJ, ISFP, and ISTJ types. In a study assessing Post-Traumatic Stress Disorder (PTSD) patients, Dalton, Aubuchon, Tom, Pederson, and McFarland (1993) reported that 64% of their sample were either ISTP, ISTJ, or INTP

types. Attempts have also been made to find type preferences of alcoholics and suicidal patients (Dawes, 1991; Komisin, 1992). Dawes (1991) reported that INFP types are more likely to be chemically dependent and ENTJ types were least likely to be chemically dependent. Komisin (1992) reported that INFP types were more likely to engage in suicidal behaviors and ESTJ types were least likely to have problems with suicidal behavior.

Ware, Rytting, and Jenkins (1994) found that students moved toward I, S, and T under stressful conditions regardless of their previous psychological type preference scores. It seems that under stress, individuals are (1) moving attention from the external world to the internal, subjective world, (2) becoming more concrete and fact-oriented in perception, and (3) distancing themselves from emotions. This set of strategies may be adaptive because it helps people mobilize resources by focusing on the self, focusing on reality (facts), and controlling emotions.

Defense Mechanisms

Imagine this scenario taken from the Defense Mechanisms Inventory (DMI; Ihilevich & Gleser, 1993a): "You are waiting for the bus at the edge of the road. The streets are wet and muddy after the previous night's rain. A car sweeps through a puddle in front of you, splashing your clothes with mud," (Ihilevich & Gleser, 1993a). Or suppose, "After only two years of marriage, you learn that your spouse is afflicted with a terminal illness and will not live to see the new year." In both of these hypothetical situations, the individual is under stress and there is little or nothing he or she can do to cope and deal directly with the objective situation because it has already occurred. The situation might become unbearable unless the individual develops some method of

coping with this stress. Failure to cope can result in a high level of anxiety or even, conceivably, decompensation into a neurosis (Freud, S., 1926/1959; Millon, 1986). Defense mechanisms, first introduced by S. Freud (1894/1962, 1896/1966) and expanded upon by A. Freud (1966/1937), are unconscious processes that help individuals to cope with stress that cannot be directly or effectively dealt with. Defense mechanisms resolve conflict between perception of a situation and internalized standards by distorting the internal or external world or by blocking awareness of the internal or external world (Gleser & Ihilevich, 1969).

Unconscious defense mechanisms are often activated when threats are perceived as impossible to resolve. Additionally, Vaillant (1971) found that defense mechanisms help control biological drives and manage unresolved conflicts. Both anxiety is reduced and perceived self-efficacy is enhanced whether the mastery over the situation is real or illusory (Bandura, 1977). Consequently, defense mechanisms are a necessary and often appropriate response. Even more notable, the use of defense mechanisms is related to different levels of physiological reactions to stress and to the efficiency of the immunological system (Asendorpf & Scherer, 1983; Jensen, 1987; Temoshak, 1987). Defense mechanisms, therefore, also have a direct and practical use in maintaining the health of an individual. Nonetheless, the self-deceptive nature of defense mechanisms supports Freud's contention that defense mechanisms operate at an unconscious level.

It should be noted that defenses are different from coping. Defenses are unconscious, nonintentional, and determined by disposition whereas coping is conscious, intentional, and determined by the situation. Furthermore, coping does not remove problems from awareness (Cramer, 2000). Despite this distinction, defense

mechanisms continue to be viewed as both state and trait processes as a result of their association with crisis situations (Vaillant, 1998). Ihlavich & Gleser (1993b) classified all responses to stressors, whether coping or defense mechanisms, into three categories: (1) problem solving, which involves changing oneself (e.g., skill improvement) or the environment (e.g., repairing a leaking roof) to increase the alignment between the self and environment; (2) coping strategies, which include regulating emotions (e.g., prayer, self-discipline, expressing positive and negative emotions); and (3) defense mechanisms, which involve distorting the self or the environment to change the perception of the fit between the two (e.g., projection or denial).

Despite the problem that defenses fall within the realm of the now somewhat unfashionable psychoanalytic model (Cramer, 1998), the literature continues to be full of studies attempting to discern exactly how to define, classify, measure, and make use of defense mechanisms (Cramer, 1991; Paulhus, Fridhandler, & Hayes, 1997). In other words, there is a massive corpus of evidence attesting to the validity and utility of unconscious personality processes (Cramer, 2000). Historically, there have been lapses in the literature about defense mechanisms. Then the topic is revived as interest in the topic recurs (Vaillant, 1998). As the study of defenses has currently become more mainstream due to the "cognitive revolution" in psychology, the importance of studying defenses will continue to increase (Marx & Cronan-Hillix, 1987). Notably, the notion that mental processes occur outside of awareness has been reaffirmed by cognitive psychologists. This thinking is reflected in such concepts as incubation in the study of creativity (Greenwald, 1992; Lazarus, 1998). Furthermore, the acceptance of such

thinking inadvertently brings defense mechanisms back into vogue with the current *Zeitgeist*.

There have been at least forty different defense mechanisms proposed and discussed in the literature (Laughlin, 1979) since the time that Freud identified the original nine defense mechanisms: repression, regression, turning against self, reaction-formation, undoing, introjection, projection, isolation, and reversal (Freud, A., 1937/1966). This multiplicity of defenses and its resultant conceptual confusion has been one of the primary difficulties in studying defense mechanisms. Each researcher tends to use his or her own terms and definitions for the various defenses. Therefore, for the purposes of this study, terms and definitions will be limited to Freud's original nine defense mechanisms and the Defense Mechanisms Inventory clusters to be explained later.

An additional difficulty in the empirical investigation of defense mechanisms lies with the nature of unconscious defenses. How does one reliably and validly measure something as elusive as an unconscious, ambiguous distortion of self or environment? Despite these inherent difficulties in tapping the individual's unconscious to assess defense mechanisms, many researchers have demonstrated satisfactory results in defense mechanism assessment (Blum, 1955; Kragh & Smith, 1970). For example, a recent study (Adams, Wright, & Lohr, 1996) found scientifically acceptable evidence for the defense mechanism of reaction formation in homophobic people. Those participants classified as being prejudiced about homosexuals had a greater physical arousal when shown videotapes of gay sexual scenes than those individuals who were not classified as homophobic. Though this behavioral research seems promising, most

of the research with defense mechanisms has fallen under the realm of paper-and-pencil tests.

There has been some debate in the literature as to whether defense mechanisms are best conceptualized as state or trait constructs. Juni and Yanishefsky (1983) determined that defensive style as measured by the Defense Mechanisms Inventory is a trait that is insignificantly affected by situational variables. However, because defense mechanisms are considered to be unconscious by nature, they are thought to be capable of unexpected distortions of reality (Cooper & Kline, 1982). The reader can again look to Freudian psychoanalytic theory for clarification. Because defensive responses are defined as unconscious processes, it can be theorized that the mechanisms are automatically activated in response to perceived threats that are too painful to confront consciously. Freud compared automatic defensive responses to biological reflexes (Freud, S., 1896/1966). From this perspective, defense mechanisms are indeed stable within individuals and across situations and occasions and can thus be considered traits or styles. It follows, therefore, that the defense mechanisms construct qualifies as a basic aspect of personality. Though most individuals prefer certain defenses over others, Gleser and Ihilevich (1969) claim that habitually relying on a limited number of defenses is not as mentally healthy as employing a variety of defenses in a relatively flexible manner.

This reliance on a limited number of defenses segues into the topic of defense mechanisms in psychopathology. When Freud first began to write about defense mechanisms, he did so to provide both a causal mechanism and a course of treatment for clinical disorders such as hysteria and depression. It was not until his later writings

that he began to regard these defenses as an integral part of personality and human behavior in general (Freud, S., 1926/1959). From their inception, defense mechanisms have been viewed as occurring on a continuum. Their level of use or abuse determined whether they were reflective of adaptive or maladaptive functioning (Ihilevich & Gleser, 1993b). Defense mechanisms are considered characteristic of psychopathology when they are exaggerated in frequency, rigidity, or singularity of use.

Most of the research done with defense mechanisms has been in the study of psychopathology. *The Diagnostic and Statistical Manual of Mental Disorders*, fourth edition (DSM-IV; American Psychiatric Association, 1994) includes a glossary of 27 defense mechanisms and coping styles as well as a sample recording form labeled, "Defensive Functioning Scale."

In their proposal to integrate the defensive styles in the literature, Ihilevich and Gleser (1993a) used empirical methods to identify five styles of response: aggressive, projective, intellectualizing, intrapunitive, and repressive. This procedure led to their construction of the Defense Mechanisms Inventory (DMI; Ihilevich & Gleser, 1993a). Because of the substantial empirical support for Ihilevich and Gleser's model, those defense mechanisms assessed by the DMI (repression, regression, reaction formation, projection, denial, displacement, identification, intellectualization, and sublimation) will be used as the operationalization of defense mechanisms in this research.

In the following section, nine of the relevant basic original defense mechanisms were described: repression, regression, reaction formation, projection, denial, displacement, identification, intellectualization, and sublimation. These were reviewed first because they are the original conceptual foundation upon which the DMI Clusters

have been developed. After this review, Ihlevich & Gleser's (1993a) five DMI clusters were discussed.

Original Defense Mechanisms Proposed by Freud

Repression

Repression, the most basic defense mechanism, is woven throughout all the other defenses. Indeed, S. Freud used the word "repression" interchangeably with "defense" and argued that without the concept of repression there would be no psychoanalysis (Freud, 1914/1957). With repression, as with all the defense mechanisms, the unwanted thought or emotion is relegated to the unconscious, shielding the individual from anxiety and threats to self-esteem (Freud, S., 1914/1957). Specifically, repression operates on a continuum. It extends from amnesia, the complete forgetting of the past, to forgetting and oversleeping on the morning of an exam. Painful or unpleasant thoughts are thus excluded from consciousness. Repression usually deals with threats originating from an internal source whereas denial, to be discussed later, usually refers to dealing with stress that comes from an external origin.

Regression

Regression in adults is commonly seen as a reverting to behavior characteristic of an earlier childhood stage of life when the person was secure. In doing so, the person avoids the present conflict or stress (Freud, S., 1914/1957). For example, adults who pout, whine, and stomp off when disappointed may be using a behavior that worked for them in childhood, and they may be displaying the unconscious wish that such childish behaviors will help them succeed in getting their ways as adults.

Reaction Formation

Reaction formation is identified by an exaggerated manifestation of an impulse that is the opposite of a repressed impulse (Freud, S., 1914/1957; Rychlak, 1981). For example, a man who unconsciously wants to torture animals may become a veterinarian, thus convincing himself he is a good person. Exaggerated behavior (e.g., fervently promoting a campaign against alcohol or pornography) is often viewed as a potential indicator of reaction formation.

Projection

Projection allows individuals to perceive in others unacceptable feelings or behaviors that actually exist in their own unconscious (Rychlak, 1981). Those employing projection are, in effect, unconsciously placing their own undesirable traits or tendencies onto others, as in the case of the woman who accuses her husband of infidelity when she is actually the one who has been unfaithful or has a strong, unconscious impulse to be unfaithful.

Denial

Denial, which is analogous to "burying one's head in the sand," means that individuals refuse to accept an unpleasant reality or reinterpret an unacceptable reality in a manageable way (Thilevich & Gleser, 1993a). An example of the use of denial may be the case of a heroin addict who insists that he or she is merely experimenting with drugs. Denial is often associated with death, illness, and other painful external shocks. Denial usually refers to the unconscious non-recognition of threatening external events. Repression, on the other hand, usually refers to the unconscious non-recognition of threatening internal events.

Displacement

Displacement occurs when it is not possible or convenient to express a feeling toward the person who elicited a threat. The feeling is instead unconsciously directed toward a different, usually safer, person or object. This redirection of feeling allows the drive to be reduced, at the same time, decreasing the threat of retaliation (Rychlak, 1981). Such behavior is seen in employees who are angry at their supervisors and who then go home to take out that anger on their families. Displacement can be seen in the case of Paul who spends a full half-hour complaining to Matt that his (Paul's) wife talks too much.

Identification

Identification refers to a person's unconsciously identifying with and internalizing the behaviors and attitudes of another. Modeling oneself after someone perceived as being successful is a defense that increases an individual's sense of self-worth and helps him or her avoid feelings of incompetence (Rychlak, 1981). Identification was illustrated when Jewish concentration camp prisoners sometimes adopted the values and attitudes of their Nazi captors, or when hostages do the same in more recent times.

Intellectualization

This defense mechanism is a method of unconsciously removing the emotion from a situation in order to detach oneself from stressful problems (Freud, S., 1914/1957). An example of intellectualization is illustrated in a mother who has been told and knows that her brain-injured child is dying and who talks dispassionately at

length and in great detail to her physiological psychology colleagues in graduate school about the exact brain structures damaged.

Sublimation

Sublimation is a defense mechanism that involves redirecting repressed feelings or desires into a more socially acceptable outlet. Sublimation is the only defense mechanism that is viewed as positive. For example, aggressiveness may be channeled into competitiveness at the office, or a fiction writer may be redirecting into a productive format a repressed and unconscious impulse to tell lies. Freud believed that art, music, dance, and sculpting represented sublimations that served to redirect sexual energy into socially acceptable behavior (Rychlak, 1981).

Defense Mechanisms Inventory Clusters

Gleser and Ihlevich (1969), building upon Freud's original work about defense mechanisms, developed a model based upon five defense mechanism clusters. Construction of the Defense Mechanisms Inventory (DMI) model was accomplished in several stages. The first stage involved asking college students to respond to a series of story vignettes of conflictual situations by writing in story format what their reactions to these events might be. Their reactions fell into one or a combination of the following: their thoughts about the situation, their fantasies about what they might do in that situation, their emotional reactions in the situation, or their possible overt behavior in the described situation (Ihlevich & Gleser, 1993a). These early vignettes evolved into the current form of the DMI that now consists of ten vignettes, each followed by four questions that tap the aforementioned possible reactions.

Turning Against Object

Turning against object (TAO), the first cluster, includes such defense mechanisms as displacement, identification, and regression (Juni & Masling, 1980).

TAO has been defined as an "identification with the aggressor" (Freud, A., 1937/1966).

In TAO, the individual turns aggression outward, i.e., individuals attribute the source of their frustration to external persons or events, thereby protecting themselves. Also, they justify and thereby increase the likelihood of aggressive actions against these external agents. Besides tending to violate the rights of others, those high on TAO often show poor self-control and evade responsibility (Fleishman, 1984; Juni & Masling, 1980).

Projection

The second cluster, projection (PRO), includes the defense of projection. PRO is the defensive process of creating the illusion of control over one's undesirable characteristics by unconsciously attributing those characteristics to others. In this manner, the individual no longer psychologically "owns" the unwanted characteristic. As a result of the typical attacking of others without justification that often characterizes projection, individuals employing projection are often perceived as unfriendly and hard to get along with. Conversely, because of their typical external locus of control, individuals high on projection tend to desire recognition, external acknowledgment, and rewards (Tennen & Affleck, 1990).

Principalization

Principalization (PRN), the third defensive cluster, includes intellectualization and sublimation (Juni & Masling, 1980). PRN refers to the focus on abstract issues that removes emotion and personal significance from a threat through distillation, leaving

only the facts. As it gives an appearance of rationality, control, and "objective detachment," this defense is admired in our society and is considered a "mature defense" (Vaillant, 1971). In PRN, the individual acknowledges the facts of a situation while splitting off and repressing the affect (Ihilevich & Gleser, 1993a; Juni & Masling, 1980). In order to achieve this splitting and diminishing of personal responsibility, the individual typically employs cliches to justify threatening thoughts, behavior, or affect. Those high in PRN tend to display an internal locus of control and are likely to be verbally fluent, intelligent, more emotionally stable, and better adjusted than those with low PRN scores (Ihilevich & Gleser, 1993a).

Turning Against Self

Turning against self (TAS) allows the individual to protect his or her self-esteem by expecting the worst from future events. This protection is accomplished by maintaining negative expectations and self-criticisms and by preserving a depressed affect. Presumably, the individual deflects external repercussions in an internal direction by means of self punishment and guilt. Ihilevich and Gleser (1993a) identified four illusions achieved with TAS: (1) guilt and suffering constitute restitution for prior transgressions; (2) holding to high standards is more important than what one actually does in practice; (3) atonement, in the form of self-defeating behavior, pacifies internalized significant-others; and (4) uncontrollable, random events, such as natural disasters, accidents, or disease, are endowed with a particular purpose or meaning. Those high in TAS tend to be more introverted and have a higher tendency toward depression and even suicide (Foley, Heath, & Chabot, 1986; Cramer, 1988).

Reversal

The fifth and final cluster, Reversal (REV), includes such defenses as denial, reaction formation, and repression (Juni & Masling, 1980). REV involves responding to otherwise naturally negative events in a positive or neutral fashion, leaving the individual with the illusion of control. Those preferring this defense deal best with short-term trials and tribulations, but have difficulty with long-term situations such as a chronic illness. Prolonged situations which would normally require them to confront and solve problems, tax their short-term Pollyanna-type reactions. As a result, those high in REV have poor coping strategies and even have, according to Gur and Gur (1975), poorer physical health. On a positive note, preference for REV tends to be associated with an internal locus of control.

General Review of Defense Mechanism Research

One difficulty encountered by researchers studying defense mechanisms is that definitions are vague and ambiguous (Vaillant, 1998). Davidson and MacGregor (1998) used the four self-report measures most frequently used in research to identify six definitional criteria of defense mechanisms: the assessed behavior should (1) be unconsciously motivated, (2) result from activation of psychic threat, (3) decrease intolerable anxiety, (4) reflect a stable pattern of responses, (5) vary along a continuum of adaptation, and (6) be indicative of a specific defense mechanism. Besides the DMI, there are three other major existing self-report defense mechanism inventories: the Coping and Defending Scales, the Life-Style Index, and the Defense Style Questionnaire (Davidson & MacGregor, 1998).

Self-Report Measures

Three theoretical approaches to defenses will be described. The DMI was ultimately based upon these three models. The three most commonly used self-report defense inventory measures other than the DMI will then be described.

The Haan/Krober Model

Haan (1963) and Krober (1963) focused on the distinction between coping and defenses. Coping represented adaptive responses, such as being flexible and future-oriented, whereas defenses were viewed as maladaptive responses, such as being rigid and distorting reality. One of the more obvious difficulties with this notion is that the excessive use of a coping responses, such as humor, can make that response maladaptive.

The Lazarus/French Model

French, Rogers, and Cobb (1974) and Lazarus (1966) classified responses into either problem-focused (making positive changes in the self or the environment) or emotion-focused coping (producing changes in one's emotions, thoughts, or perceptions). While the Lazarus/French model is theoretically attractive, it is ineffective practically. Both types of responses overlap and are used together. They also influence each other. As Menaghan (1983) pointed out, people can both manage emotions and solve problems concurrently.

Vaillant's Theoretical Model

Vaillant (1971) attempted to categorize responses according to the psychological health of the person. For example, neurotics would use intellectualization, and psychotics would use denial and delusions. Vaillant's model has

an obvious difficulty because it defines its categories too rigidly and makes no allowance for those who use defense mechanisms other than the one primarily associated with their psychopathology. In other words, there is no allowance made for a neurotic who uses a defense other than intellectualization.

Coping and Defending Scales

The Coping and Defending Scales (CDS), derived from the Haan/Krober Model, assumes that coping could be easily distinguished from defending. Defensive behavior is defined as a response to conflict that is maladaptive in some way (Davidson & MacGregor, 1998). Though the scale has evolved through the years, most work with the CDS refers to the Joffe and Naditch (1977) 377-item version.

One of the strengths of the CDS is its lack of face validity which disguises the purpose of the scales to respondents. The instrument is highly correlated with observer-rated defense mechanism use and has shown promising longitudinal reliability, allowing researchers to assess the development of traits over time. One of the major disadvantages of the CDS is its 377-item length. Another problem with the scale is the reported difficulties with keying in the responses (Davidson & MacGregor). Because of these problems, the CDS has not been frequently used in the literature since 1977.

Life Style Index

The Life Style Index (LSI) is a 97-item inventory with a “usually true” or “usually not true” response format that results in scores for eight defense mechanisms including denial, displacement, and reaction formation among others (Davison & MacGregor, 1998). The authors of the LSI scale developed a sensible theoretical framework using a self-report measure while maintaining that defenses are unconscious

(Plutchik, Kellerman, & Conte, 1979). The applicability of the scale, however, outside of psychiatric populations is not available.

Defense Style Questionnaire

The Defense Style Questionnaire (DSQ) was an attempt to validate Vaillant's hypothesized maturity levels. There are several versions of the DSQ that have been developed over time, as well as different scoring systems (Davidson & MacGregor, 1998). Though the authors of the DSQ have stayed consistent with Vaillant's theoretical model of defense mechanisms, they neglected to address awareness of motivation, psychic threat activation, anxiety, and avoidance.

It is clear that developing a self-report measure of defense mechanisms is a challenging endeavor. Some of the advantages of using a self-report format include employing stimuli that are straightforward and objective. The elicited response is in a format that is unambiguous, objective, and easily scored without observer bias.

Davidson and MacGregor (1998) pointed out one fundamental difficulty in the study of defense mechanisms using self-report instruments: the meaning of defense behavior is idiographic. In other words, a behavior defined as defensive may shift across time and situations; consequently, one person's intellectualization is a defense mechanism and another person's intellectualization is not. Furthermore, sometimes intellectualization is a defense mechanism for an individual and then other times that same intellectualization is not.

Projective Methods

Some researchers have shown greater fidelity to Freudian psychoanalysis and have attempted to use projective measures in the study of defense mechanisms. The

justification for those using projective testing and interview data is the supposition that an observer can reasonably infer the result of a defensive operation of which the individual is unaware (Perry & Ianni, 1998). Several projective methods for assessing defense mechanisms will now be reviewed.

The Rorschach Test. There are three general strategies for rating defenses from the Rorschach test: (1) to use formal Rorschach scores, (2) to use thematic interpretation of the content of responses, and (3) to use a combination of the first two. There is no evidence that the Rorschach provides more data than a clinical interview (Perry & Ianni, 1998) and further work is needed to determine the usefulness of the methods described below.

Lerner Defense Scales. Using formal Rorschach scores, Lerner and Lerner (1980) developed an assessment manual for five defense mechanisms related to borderline personality disorder. Only human responses to Rorschach stimuli are scored by the Lerner Defense Scales (LDS) which limits its usefulness with some individuals. Nevertheless, the findings have been convergent with personality disorder constructs (Perry & Ianni, 1998).

Rorschach Defense Scales. Cooper, Perry, and Arnow (1988) developed the Rorschach Defense Scales (RDS) to measure fifteen defenses that include psychotic, borderline, and neurotic defenses. The RDS relies primarily on verbal content, but uses some aspects of formal scoring. Both human and nonhuman responses are used. Borderline personality diagnoses have been positively correlated with devaluation, projection, splitting, and hypomanic denial, but negatively correlated with intellectualization and isolation.

Thematic Apperception Test. Two rating scales for measuring defense mechanisms have been developed based on the Thematic Apperception Test (TAT) – the Defense Mechanism Manual and the Defense Mechanism Test.

Defense Mechanism Manual. Cramer (1991) developed the Defense Mechanism Manual (DMM) as a way to rate denial, projection, and identification from TAT card transcripts. This rating system is based upon Cramer’s position that denial and projection are less adaptive than identification. Research with the DMM supports the use of identification in the presence of positive life experiences and the use of denial and projection in the instance of negative life experiences (Perry & Ianni, 1998). Further, clinical treatment led to a decrease in the use of the less adaptive defenses (Cramer & Blatt, 1992).

Defense Mechanism Test. The Defense Mechanism Test (DMT) uses TAT-like pictures presented in a tachistoscopic device, with exposures ranging from subliminal to accurate exposures. In order to elicit defensive responses, the main figure in the pictures was presented with a threat (Cooper & Kline, 1986). Participants draw and describe their perceptions following each presentation. Though this test is popular in European research and shows good interrater reliability, it is not clear whether the DMT measures defenses or other phenomena. Gitzinger (1993) developed a computer assisted method based on the DMT called the Defense Mechanism Computer Test (DMCT).

Clinical Interview Methods

In addition to objective self-report measures and projective measures, there are a number of clinical interview methods including “Defense and Coping Mechanisms”

(Haan, 1963), “the Ego Profile Scale” (Semrad, Grinspoon, & Fienberg, 1973), “Overall Effectiveness of Defensive Functioning” (Bellak, Hurvich, & Gediman, 1973), “Hackett and Cassem’s Denial Scale” (Hackett & Cassem, 1974), “Vaillant’s Clinical Vignette Method” (Vaillant, 1976), and the “Defense Mechanism Rating Scales” (Perry, 1990). The most obvious advantage of these methods is their direct lineage from Freud’s original observational approach (Perry & Ianni, 1998). These interview-based clinical rating methods require training of the researchers in order to demonstrate inter-rater reliability. The primary focus of the research with these instruments is to determine the relationship between specific defenses and diagnostic disorders. It should be noted that the primary purpose of these instruments is not research, but to assist with screening, which can hopefully lead to appropriate treatment for patients.

Though Freud based much of psychoanalysis on defense mechanisms, he failed to clarify how defense mechanisms could be modified (Ihlevich & Gleser, 1993b). Current researchers seem to have similar difficulties. Nevertheless, there are a number of studies attempting to analyze the relationship between defense mechanisms and mental disorders. Most personality disorders are positively associated with what is known in the literature as a highly maladaptive defense style and are negatively associated with what is known as a mature defense style (Sinha & Watson, 1999). Albuher, Abelson, and Nesse (1998) found improvement in adaptive defenses following seven weeks of behavior therapy. In a similar study of depressed patients by Akkerman, Lewin, and Carr (1999), participants moved toward the range of mature defenses as their depression was alleviated.

Most of the research thus far has merely measured changes in defenses following treatment. In the future, perhaps the active treatment of defenses by the therapist may become part of the more general treatment. This use of defense mechanisms in treatment would be especially practical as holistic treatments become more accepted in the medical field. For example, patients who have serious medical conditions (e.g., cancer) may benefit from treatment of their defenses to increase compliance with a therapeutic regimen (Fulde, Junge, & Ahrens, 1995).

It should be mentioned that therapy should take into consideration whether the defense is adaptive. A defense should not be attacked on the mere basis of being a defense. Without some method of dealing with anxiety, a patient can decompensate (Vaillant, 1994). One debate in the literature concerns whether the defense acting to protect the self in the therapeutic relationship should be interpreted or should be allowed to more fully unfold (Cooper, 1998).

As was mentioned earlier, defense mechanisms are fundamental theoretical and empirical constructs in the study of psychopathology. The most succinct illustration of this point lies in the inclusion of a "Defense Functioning Scale" as an optional axis of diagnosis in the *Diagnostic and Statistical Manual of Mental Disorders*, fourth edition (DSM-IV; American Psychiatric Association, 1994).

Other Investigations of Personality and Defenses

Although the focus of this research is on personality as measured by a type approach, a brief section describing trait-based instruments and studies that have been done with those instruments and defense mechanisms will be mentioned in the interest of making a thorough sweep of the literature.

NEO-PI-R

The NEO-PI-R (Costa & McCrae, 1992) is a 240-item self-report instrument designed to assess personality factors of the Five Factor Model. The NEO-PI-R is a research instrument designed to describe and predict behavior based on personality traits. Costa and McCrae (1992) describe the NEO-PI-R as a measure of nonpathological, or normal, personality. The NEO-PI-R is also commonly used as a counseling tool to further self-understanding and as a selection tool in the prediction of job performance.

Lyoo, Gunderson, and Phillips (1998) found that participants with depressive personality disorder scored lower on adaptive defense mechanisms as measured by the DSQ. Soldz, Budman, Demby, and Merry (1995) reported that defensive style was strongly related to personality pathology and that there was significant empirical overlap between defensive style and trait models of personality. The DSQ contributed significantly to explaining Axis II pathology after the NEO-PI-R factors were accounted for.

16 Personality Factor Questionnaire

The 16 Personality Factor Questionnaire (16PF) is a 187-item self-report instrument measuring levels of warmth, reasoning ability, emotional stability, dominance, liveliness, rule consciousness, boldness, sensitivity, distrust, abstractedness, privateness, worrying, openness to change, self-reliance, perfectionism, and tension (Cattell, Eber, & Tatsuoka, 1970). The 16PF is commonly used to provide information about a person's management style and potential future career development and is also

often used to provide clinical information for diagnostic support and treatment planning.

Using subliminal threat and the DMT, Cooper and Kline (1986) found that anxiety, as measured by the 16PF, affected scanning speed more than individual differences. Cooper and Kline (1989) then went on to use the DMT and the 16PF to examine the relationship between the performance of male pilots and general defensiveness, thereby yielding a method of selecting individuals for stressful occupations. Pellitteri (1999) used the DSQ and the 16PF to determine that adaptive defense mechanisms allow an individual access to his or her emotional resources, which, in turn, enable that individual to synthesize and integrate affect and to develop a reasonable understanding of emotions. Pellitteri (1999) also proposed that emotional intelligence abilities of perception and regulation may be more related to conscious coping skills than to unconscious defense mechanisms. Using the DMQ and the 16PF, George (2000) attempted to demonstrate that individuals with high faith were more likely to show higher levels of psychological well-being. However, George suggested generalization be done with caution due to the high level of individual variation.

Minnesota Multiphasic Personality Inventory - 2

The Minnesota Multiphasic Personality Inventory - 2 (MMPI-2) is a 567-item empirically-based assessment of adult psychopathology used by clinicians to assist with the diagnosis of mental disorders and the selection of appropriate treatment (Greene, 1991). It is used for forensic and neuropsychological evaluations, including the detection of malingering, evaluation for high-risk positions involving the public's

safety, criminal justice and corrections, assessment and treatment of medical patients, substance abuse, marriage and family counseling, and college and career counseling.

Anderson and Leitner (1991) related defense mechanisms as measured by the DMI to personality as measured by the MMPI-2 and a physical symptoms checklist. They found a clear introjecting defensive style was related to high amounts of reported depression, anxiety, and introversion whereas a healthy defense grouping was negatively related to the symptom variables, suggesting the existence of different adaptive levels of defensive functioning. Sinha and Watson (1999), using the DSQ and the MMPI-2, reported that most personality disorders are positively associated with the highly maladaptive immature defense style and negatively associated with the mature defense style.

California Personality Inventory

The California Personality Inventory (CPI) is a 434-item self-report instrument designed to provide a portrait of an individual's professional and personal style. The CPI is a research instrument designed to describe and predict behavior based on personality traits including independence and flexibility (Gough, 1996). The CPI employs four scales: (1) social expertise and interpersonal style; (2) maturity; (3) achievement orientation; and (4) personality interest styles.

Thelen and Varble (1970) administered the CPI and the MMPI to therapy and nontherapy groups. The therapy group had higher defense and lower coping scores than the nontherapy group. No other studies using the CPI and defense mechanisms have been done at the time of this writing.

Research Using the Defense Mechanisms Inventory

A number of studies using the DMI have been aimed at validating the DMI (Cooper & Kline, 1982; Gleser & Ihlevich, 1969; Gleser & Sacks, 1973; Juni & Masling, 1980; Juni and Yanishefsky, 1983). It was mentioned earlier that the DMI is a measure of the defensive domain of personality. More specifically, the DMI is thought to assess a person's characterological defensive profile. A number of studies have used the DMI measure of defensive style in studying such topics as participation in psychotherapy (Gleser & Ihlevich, 1969), suicidal tendencies (Scholz, 1973), field dependence-independence (Perlman & Kaufman, 1990; Bogo, Winget, & Gleser, 1970), physical distress in females (Greenberg & Fisher, 1984), aggression (Juni & Masling, 1980), shyness (Foley, Heath, & Chabot, 1986), and even birth order (Dudley, 1978). Firstborns scored lower on TAO than later-borns, perhaps because firstborns tend to be more concerned with social desirability than later-borns (Dudley, 1978).

Juni and Yanishefsky (1983), used 52 females and 54 males and manipulated the situation during an administration of the DMI. Halfway through the DMI administration, the participants were interrupted, at which time half were given a difficult task and half were given an easy task. There were no significant changes in the overall defensive style composite scores between the two groups. Comparisons of the first half of the tests to the second half suggested that defensive style is a trait and is resistant to situational stress.

In a similar study, Juni and Masling (1980) manipulated the experience of aggression by angrily accusing prompt participants of being late for an experiment. Those participants who expressed anger in this situation scored higher on a combination

of TAO and PRO than they scored on the other three combined defense mechanisms of PRN, TAS, and REV. The researchers' justification in creating a composite DMI score came from the positive correlation between TAO and PRO found by Blacha and Fancher (1977) and the positive correlation between PRN and REV reported by Gleser and Ihilevich (1969). Juni and Masling (1980) concluded that the predictability of the DMI may be increased by employing a composite score that combines measures of theoretically related defensive styles.

Berman and McCann (1995) examined the relationship between defense mechanisms and personality disorders using the DMI and the Millon Clinical Multiaxial Inventory-II (MCMI-II; Millon, 1987). Some personality disorders (e.g., antisocial and dependent) seem to be associated with a preference for a particular defense mechanism. On the other hand, preference for one defense mechanism may be associated with several personality disorders. For example, the REV defense mechanism cluster is associated with both avoidant and obsessive-compulsive personality disorders. Theoretically expected significant relationships were found between scores that suggested certain personality disorders and DMI scores, indicating certain defensive preferences. The Antisocial and Passive-Aggressive scales were positively correlated with TAO, the Obsessive-Compulsive scale was positively correlated with REV, the Paranoid scale was positively correlated with PRO, and the Self-Defeating scale was positively correlated with TAS. The other proposed relationships hypothesized by Millon (1987) were not empirically supported. For example, no support was provided for a relationship between borderline personality disorder and regression. Nevertheless, Berman and McCann's findings may be useful in alerting clinicians to the typical

defenses used by some of those with more common personality disorders, some of which have heretofore been difficult to treat effectively.

Tauschke, Helmes, and Merskey (1991) correlated the DMI preference score with the Hysteroid/Obsessoid Questionnaire (HOQ; Caine & Hope, 1967), a 48-item scale that measures the extraversion versus introversion components of personality. The authors chose the HOQ as a brief but reliable measure of the extraversion-introversion portion of personality in an attempt to show a relationship between defense mechanisms and personality as opposed to defense mechanisms and mood state. They were attempting to demonstrate the need to alter defense mechanisms in individuals with personality disorders. Extraversion was positively correlated with TAO and negatively correlated with TAS. The DMI did not correlate with depression or anxiety in the study done by Tauschke, Helmes, and Merskey (1991). Their findings support the notion that defense mechanisms are better conceptualized as trait variables than as state variables (Blum, 1955; Kragh & Smith, 1970).

A recent study using the DMI (Adams, Wright, & Lohr, 1996) reported evidence implicating the defense mechanism of reaction formation in homophobic people. Those participants classified as being prejudiced about homosexuals had a greater arousal when shown videotapes of gay sexual scenes than those individuals who were not classified as homophobic. Arousal was measured by changes in penile circumference. Similarly, Luciano (1999) found that homosexual males increased their use of defenses on the DMI when telling a story in response to pictures involving heterosexual activity. In both of these studies, use of defense mechanisms increased when the individual was confronted with tasks or stimuli contrary to their comfort level.

Using a Q-sort, Cramer (1999) attempted to correlate defense mechanisms with personality disorders. Stories elicited by the Thematic Apperception Test were coded for the presence of three defense mechanisms from the DMI: denial, projection, and identification. Cramer ranked four B-cluster (*The Diagnostic and Statistical Manual of Mental Disorders*, fourth edition; APA, 1994) personality disorders (Borderline, Narcissistic, Histrionic, and Antisocial) according to their developmental level as determined by three criteria: the capacity to consider others, level of self-focus, and level of consciousness. B-cluster disorders are grouped together based on their descriptive similarities in symptomology. Cluster B individuals often appear dramatic, emotional, and erratic. Histrionics were considered most developed of the four due to their ability to consider others. They were followed by Narcissistics who can experience guilt, then by Antisocials who are self-focused and have no guilt, and then by the Borderlines who are considered the least developed. In a similar fashion, Cramer ranked defense mechanisms from lower to higher functioning, beginning with denial (early childhood), projection (middle childhood), and identification (later adolescence). As the author predicted, the developmentally lower level, denial, was associated with the theoretically lower functioning borderline diagnosis. Also, as predicted, the defense mechanism of identification was not associated with the four B-cluster personality disorders. Despite some overlap due to the similarities of the disorders, the overall trend was as hypothesized.

Rationale and Hypothesis Generation

In this rationale, the two bipolar psychological type dimensions (extraversion-introversion and thinking-feeling) that are the foundation of this research will be

described in relation to defense mechanism preferences, and hypotheses will be constructed. Then, extraversion-introversion and thinking-feeling will be combined, forming the four quaternary types (IF, IT, EF, ET). The author will then construct hypotheses predicting specific relationships between the four quaternary types (ET, EF, IT, IF) and defense mechanisms.

The rationale for these hypotheses is based on the assumption that stressors occur on a continuum from "slight" through "extreme." Given the obviously imaginary nature of the scenarios that comprise the DMI, this instrument is assumed to assess defensive functioning in slightly to moderately stressful situations when defensive operations are expected to involve exaggerations of the primary qualities of the typical attentional, perceptual, and cognitive processes that are operationalized in psychological type theory.

*Predicting Defense Mechanism Preference
from Psychological Type*

Extraversion-Introversion

Researchers hypothesize that a preference for extraversion will be associated with preference for defensive clusters that emphasize externally directed expression of cognition, affects, and behaviors, as in TAO (which involves negative affects, cognitions, and actions directed against others). Conversely, researchers hypothesize that a preference for introversion will be associated with a reported preference for defensive clusters that emphasize internally directed expressions and transformations of cognition, affects, and behaviors. Defensive clusters that emphasize internally directed processes include TAS (which involves negative affects directed against the self) and PRN (which involves intrapsychic cognitive transformations that change the subjective

meaning or experience of events). For example, a greater preference for introversion than extraversion might be associated with the tendency to make negative self-attributions (e.g., blaming oneself for threatening experiences) that result in self-blame, depression, or guilt.

Thinking-Feeling

The process of objectification, as reflected in psychologically detaching or distancing oneself from threatening situations, is a primary quality of thinking (Myers, I. B., 1995). Therefore, it is hypothesized that a preference for thinking will be associated with defenses that emphasize objectification. The engagement of objectification, for example, in an introverted direction involves "splitting" the emotional content of threatening experiences from the cognitive content, allowing the person to address the threatening experience in an objective, intellectual fashion. Thus, a preference for thinking is hypothesized to be associated with preference for the PRN defense cluster. When engaged in an external direction, the process of objectification would facilitate treating other persons as objects, thereby subjectively justifying the directing of negative affects and behaviors towards them, as also seen in those who use the defense mechanism of TAO. The PRO defensive cluster also involves a kind of objectification because people who use PRO distance themselves from their own unacceptable unconscious qualities by attributing those qualities to other persons. In summary, a preference for thinking is hypothesized to be associated with a preference for PRN, TAO, and PRO.

Conversely, empathic identification with others and desire for approval from others are primary qualities of feeling. These primary qualities of feeling are expected

to serve as a “buffer,” preventing the person from dealing with threatening experiences by directing negative affect and intentions toward others. Therefore, a preference for feeling is hypothesized to be associated with a preference for TAS and REV.

Next, the extraversion-introversion and thinking-feeling dimensions will be combined into a quaternary model of personality (IF, IT, EF, and ET). Hypotheses will be formulated about the relationships between this quaternary and defensive cluster preferences.

Introverted Feeling (IF) Quaternary

As stated earlier, individuals scoring high on both introversion and feeling tend to use their own subjective criteria for a sense of value and for ideals such as love and loyalty (Jung, 1921/1990). The attentional preference for this IF type is directed toward the introverted, subjective world, emphasizing ownership of feelings and affects. If these characteristic qualities are exaggerated, as in defensive functioning, IF types would be hypothesized to tend to direct negative emotions toward the self. Such directing of the negative emotions toward the self corresponds to a preference for the defensive cluster of TAS. The IF type would be expected to show a natural defensive preference for directing negative feelings toward the self. These individuals would engage in behaviors such as self-blame, self-directed anger, and depression. Under slight or moderate stress, the IF type is hypothesized to attribute the causes of conflicts to the self (i.e., introverted direction) and engage subjective processes (e.g., affects and blame) toward the self in defensive operations.

Introverted Thinking (IT) Quaternary

Having a preference for both introversion and thinking, IT types tend to employ a detached, objective approach, interpreting frustrating events in an impersonal fashion (Quenk, 1993a). Thus, they tend to emphasize the control of emotion, both positive and negative. The IT type tends to apply logical, objective thinking to his or her inner world. Because of the objectivity and detachment that characterizes thinking, the IT type would be expected to function defensively by analytically splitting affect from cognition. The IT type, therefore, would be hypothesized to prefer the PRN defensive cluster. The IT type would tend to attribute problems to the self (introverted direction), but would tend to apply objective, detached thinking to these problems, separating the affects from the cognitions, as also seen in those who use the defense mechanism of PRN. Thus, IT types would be expected to be able to talk objectively about their conflicts without engagement of affect. It is also hypothesized that the IT type would prefer the PRO defensive cluster because these defenses involve detaching or distancing oneself from threatening intrapsychic experiences.

Extraverted Feeling (EF) Quaternary

Individuals scoring high on both extraversion and feeling, EF types, tend to be optimistic about both life and human potential (Quenk, 1993a). They prefer to focus on the positive and tend to ignore negative information (Quenk, 1993a). These characteristics correspond with the defense mechanism of REV. Doyle (1999) labels the EF quaternary as "Expressive" because EF types tend to be relatively expressive of feelings and to be more social and optimistic. When subject to severe psychopathology, the EF type tends to be diagnosed as Narcissistic, Manic, or Hysterical. This type tends to

direct his or her emotions and affects externally in an exaggerated fashion, which again supports the hypothesized usage of REV defenses, especially reaction formation.

Extraverted Thinking (ET) Quaternary

The ET types tend to show an externally directed focus of attention and, given their thinking preference, may tend, particularly under stress, to view others in an objective, detached fashion (i.e., as instrumental to their own dominance and goal attainment). Doyle (1999) labels the ET a "Driver," emphasizing that type's typical relentlessness and forcefulness in trying to obtain his or her personal goals. This type would tend to display defenses that involve forcing the outer world to conform to his or her wishes and would direct aggression outwardly to achieve his or her goals. The TAO defensive cluster appears complementary to the primary attentional and judgmental qualities of the ET type. Thus, the ET type is hypothesized to report the greatest preference for the TAO defensive cluster.

Hypotheses

All hypotheses will be tested separately by gender although the same hypotheses will be held for both males and for females. Hypotheses will be tested separately by gender for the following reasons: (1) gender is significantly related to the thinking-feeling scale of the MBTI (with approximately 60% of males reporting a thinking preference, while about 60% of females report a feeling preference) (Myers & McCaulley, 1985); (2) gender is significantly related to certain DMI defensive cluster preferences (with males scoring higher on TAO and PRO, while females tend to score higher on TAS) (Ihilevich & Gleser, 1993a); and (3) analyzing results separately by gender will simplify and clarify interpretation (e.g., it will avoid the need to analyze and

interpret two-way and three-way interactions that include gender as a factor). The potential for incremental Type I error due to a greater number of statistical tests (i.e., due to separate tests of each hypothesis for males and for females) will be controlled by more guardedly interpreting the results with this issue in mind.

Hypotheses Concerning EI, TF, and DMI Cluster Preferences

1. Hypotheses concerning EI continuous scores and DMI cluster preference scores:

It is hypothesized that smaller scores on the EI dimension (indicating a greater preference for E) will be associated with greater scores, (indicating a greater preference) for TAO.

It is hypothesized that greater scores on the EI dimension (indicating a greater preference for I) will be associated with greater scores (indicating a greater preference) for TAS, PRN, and PRO.

2. Hypotheses concerning TF continuous scores and DMI cluster preference scores:

It is hypothesized that smaller scores on the TF dimension (indicating a greater preference for T) will be associated with greater scores (indicating a greater preference) for TAO, PRO, and PRN.

It is hypothesized that greater scores on the TF dimension (indicating a greater preference for F) will be associated with greater scores (indicating a greater preference) for TAS and REV.

3. Hypotheses concerning EI categorical scores in relation to DMI cluster preference scores will be tested to provide information about the magnitude of the differences between EI and DMI cluster preference scores.

It is hypothesized that the extraverted group will record greater scores, (indicating a greater preference) for TAO than the introverted group.

It is hypothesized that the introverted group will record greater scores (indicating a greater preference) for TAS, PRN, and PRO than the extraverted group.

4. Hypotheses concerning TF categorical scores and DMI cluster preference scores will be tested to provide information about the magnitude of the differences between TF and DMI cluster preference scores.

It is hypothesized that the Thinking group will record greater scores (indicating a greater preference) for TAO, PRO, and PRN than the Feeling group.

It is hypothesized that the Feeling group will report greater scores (indicating a greater preference) for TAS and REV than the Thinking group.

***Hypothesis Concerning Effect of the Interaction Between EI and TF
on DMI Cluster Preferences***

It is hypothesized that the interaction of EI and TF (i.e., in the formation of the four quaternary groups) will show a significant effect on DMI cluster preference scores.

***Hypotheses Based on the Four Quaternary Groups
and DMI Cluster Preferences***

One between group hypothesis and one within group hypothesis will be tested for each quaternary group.

IF Quaternary Group and TAS Hypotheses

Among the four quaternary groups, the IF group will score highest (record the greatest mean preference score) on TAS.

Among the five defensive clusters, the IF group will score highest (record the greatest mean preference score) for TAS.

IT Quaternary Group and PRN and PRO Hypotheses

Among the four quaternary groups, the IT group will score highest (record the greatest mean preference scores) on PRN and PRO.

Among the five defensive clusters, the IT group will score highest (record the greatest mean preference scores) for PRN and PRO.

ET Quaternary Group and TAO Hypotheses

Among the four quaternary groups, the ET group will score highest (record the greatest mean preference score) for TAO.

Among the five defensive clusters, the ET group will score highest (record the greatest mean preference score) for TAO.

EF Quaternary Group and REV Hypotheses

Among the four quaternary groups, the EF group will score highest (record the greatest mean preference score) for REV.

Among the five defensive clusters, the ET group will score highest (record the greatest mean preference score) for REV.

CHAPTER 2

METHOD

Participants

Participants for the study included 223 undergraduate students enrolled in psychology classes at Louisiana Tech University. Participation was voluntary. The mean age for the sample was 23.05 years ($sd = 8.13$ yrs). Ages ranged from 17 to 59 years. Males comprised 30% (65) of the sample and females 70% (158). Totals do not always equal 223 because some data were missing. Administration occurred during classtime and was supervised by the author. Approval for the study was obtained from the Louisiana Tech University Human Use Committee. Permission was obtained from the Department Head and instructors prior to meeting with classes. Participants were treated in accordance with the "Ethical Principles of Psychologists and Code of Conduct" (American Psychological Association, 1992). Participants' responses were held confidential.

Instruments

Instruments in the study included the Myers-Briggs Type Indicator (MBTI; Form G) and the Defense Mechanisms Inventory (DMI; adult form). Demographic information was obtained from the MBTI answer sheet. Completion of both instruments took approximately 90 minutes.

Myers-Briggs Type Indicator (MBTI)

The MBTI (Form G; Myers & McCaulley, 1985) is a self-report assessment instrument that expands upon Jungian Typology. Form G is the version recommended for research. Form G, rather than the new Form M, was used because at the time of this research more substantial evidence for validity and reliability existed for Form G. The MBTI is an objective pencil and paper test. The inventory consists of 126 forced-choice items that represent behavioral preferences and preferred self-descriptive adjectives. A set of four templates was used to score the MBTI, yielding classification scores, preference scores, and continuous scores for each of the four preferences (EI, SN, TF, and JP). Further, each individual may be provided with a whole type profile consisting of four letters (e.g., INFP) that represent the combined preferences for each bipolar type dimension. Because each bipolar scale has two preferences, there are sixteen possible whole personality types. According to Psychological Type Theory, each whole type is a unique configuration that is greater than the sum of the four constitutive type dimensions (Pittenger, 1993). As is standard for psychological type research, both classification scores (e.g., E or I, T or F) and continuous scores were used in analyses (Myers & McCaulley, 1985). However, for research purposes, continuous scores on the four dimensions can be calculated by adding or subtracting a constant of 100 (Myers & McCaulley, 1985).

Reliability. According to the MBTI manual (Myers & McCaulley, 1985), split-half reliability on the MBTI (Form G), as reported by the MBTI data bank, ranges from .82 on EI to .83 on TF. More specifically, the overall split-half reliability for males is .82 on EI and .82 on TF. For females, the overall split-half reliability is .82 on EI and

.79 on TF. Test-retest reliabilities of the MBTI show consistency over time. At five-week intervals, males yielded scores ranging from .77 on EI to .91 on TF while females yielded scores ranging from .89 on EI to .56 on TF. When participants report a change in type, it is most likely to occur in only one of the four bipolar preference dimensions, usually for a dimension in which the respondent originally reported a “slight” preference (Myers & McCaulley, 1985). Participants were further given questionnaires designed to induce either mood elevation or depression. Even though there were mood changes, the reliability coefficients for the MBTI remained high and ranged from .78 to .87 (Myers & McCaulley, 1985). Internal consistency reliabilities estimated by coefficient alpha were not reported for Form G in the MBTI manual. Those reported for Form F were acceptable for most adult samples.

Validity. The MBTI is a valid assessment instrument because it is significantly correlated with other scales in theoretically expected ways. Extraversion has been correlated with other extraversion scales, including those from the MMPI-2 and the 16PF. These correlations yielded validity coefficients ranging from .77 to .40. Sipps and Alexander (1987) who administered both the MBTI and the Eysenck Personality Questionnaire (EPQ), both of which measure the EI dimension of personality, reported a convergent validity of .94. The MBTI and the EPQ were derived from different theoretical positions. However, in a factor analysis of the MBTI, the EPQ, and three measure of extraversion (a Sociability component, an Impulsivity or Nonplanning component, and a Liveliness/Risk taking/Jocularly component), the EI and JP scales of the MBTI appeared to be a factorially valid measure of extraversion in the Impulsivity/Nonplanning sense (Sipps & Alexander, 1987). Myers and McCaulley

(1985) provide a summary of the extensive evidence supporting the validity of the MBTI and its subscales.

Defense Mechanisms Inventory (DMI)

The DMI (adult form; Ihlevich & Gleser, 1993a) is a self-report assessment instrument that is based upon the original defense mechanisms proposed in psychoanalytic theory (Freud, S. 1894/1962). It is an objective paper-and-pencil test. The DMI consists of 10 gender-appropriate stories describing conflict situations. There are separate forms for males and for females. Each story is followed by four questions, requesting the respondent to report his or her probable actual behavior, impulsive fantasy response, thoughts, and affects. For each of the four questions, the subject chooses from five different response alternatives that represent the five defense mechanism clusters. Each test, therefore, yields a total of 200 responses. Participants are asked to indicate the response most like them (M) and the one least like them (L). A set of five templates is used to score each answer sheet. Responses marked M are given a score of 2, responses marked L are given a score of 0, and those left blank are given a score of 1. A numeric score is thus obtained for each cluster.

Reliability. In a number of studies conducted using the DMI, average test-retest reliability scores for stability over two to four week periods ranged from .62 on PRO to .82 on TAO (Ritigstein 1974; Weaver, 1982; Weissman, Ritter, & Gordon, 1971) with an average of about .75 for the five defenses (Ihlevich & Gleser, 1993a). The average internal consistency on a random parallel test ranged from .61 on PRO to .80 on TAO (Juni, 1982; McKinstry, 1977; Wilson, 1976). TAO and REV showed the highest reliability scores, and PRO showed the lowest reliability score.

Validity. Evidence supporting validity of the DMI was presented in the previous section titled “Research using the Defense Mechanisms Inventory.” Despite the theoretical and methodological difficulty inherent in empirically measuring defensive operations, the DMI is face valid and demonstrates satisfactory validity and reliability for a self-report instrument (Ihlevich & Gleser, 1993a). It is the most widely used paper-and-pencil self-report inventory for assessing defense mechanisms.

Procedure

After obtaining informed consent through the use of a signed statement, the author administered the MBTI and the DMI in classroom settings according to test instructions. Depending on class length, the two assessment instruments were either given together or on consecutive days. No time limit was imposed. Each instrument was hand-scored by the author using appropriate templates.

CHAPTER 3

RESULTS

Data analyses were conducted using several statistical techniques. Descriptive statistics, including means, standard deviations, and internal consistencies, were calculated for each variable (see Table 1). Some of the alphas for the DMI shown in the table below are under the recommended .70 to .80, but are still above the .50 criterion recommended by Nunnally (1978).

TABLE 1

Means, standard deviations, and coefficient alphas for EI, TF and the DMI cluster scores.

	<u>M</u>	<u>sd</u>	<u>α</u>
EI	98.1	27.4	.84
TF	102.3	25.1	.85
TAO	40.1	10.1	.86
PRO	39.2	5.6	.61
PRN	44.2	5.9	.66
TAS	38.2	7.3	.76
REV	38.0	8.0	.80

Note. $N = 223$. EI = Extraversion-Introversion continuous score; TF = Thinking-Feeling continuous score; TAO = Turning Against Object; PRO = Projection; PRN = Principalization; TAS = Turning Against Self; REV = Reversal.

*Hypothesis Testing Concerning EI Scores, TF Scores, and
DMI Cluster Preference Scores*

1. The hypotheses concerning EI scores and DMI cluster preference scores were tested by computing Pearson product-moment correlation coefficients between EI continuous scores and each of the five DMI cluster preference scores. One set of correlations was computed for females, another for males.

2. The hypotheses concerning TF scores and DMI cluster preference scores were tested by computing Pearson product-moment correlation coefficients between TF continuous scores and each of the five DMI cluster preference scores. One set of correlations was computed for females, another for males.

3. The hypotheses concerning EI categorical scores in relation to DMI cluster preference scores were tested by a series of five *t*-tests with EI category used as the classification variable and the five DMI preference scores used as the dependent variables. One series of *t*-tests was computed for females, another for males. To guard against incremental Type I Error, alpha level was set to $p < .01$.

4. The hypotheses concerning TF categorical scores in relation to DMI cluster preference scores were tested by a series of five *t*-tests with TF category used as the classification variable and the five DMI preference scores used as the dependent variables. One series of *t*-tests was computed for females, another for males. To guard against incremental Type I Error, alpha level was set to $p < .01$.

*Hypothesis Testing for Interaction of EI and TF on DMI
Cluster Preference Scores*

A multivariate analysis of variance (MANOVA) was used to test the general hypothesis of an interaction between EI and TF on DMI cluster preference scores.

The MANOVA model is the following: Y (DMI cluster preference scores) = A (EI category) + B (TF category) + AB (EI category x TF category). One MANOVA was computed for the females, another for the males.

*Hypothesis Testing Concerning the DMI Cluster Preferences
of the Four Quaternary Groups*

The between and within quaternary group hypotheses will be tested by listing the ordinal mean DMI cluster preferences for all four quaternary groups and noting whether the preferences conform with the hypotheses. Tukey's LSD post hoc test will be used to test for significance of group differences in mean DMI cluster preference scores. Separate tests will be performed for males and for females.

Results for Hypotheses Concerning EI, TF, and DMI Cluster Preferences

1. Table 2 lists the correlation coefficients between the EI scale scores and the five DMI cluster preference scores. As indicated in Table 2, none of the hypotheses concerning relationships between EI scores and DMI cluster preference scores were supported by significant correlation coefficients for either females or males. It was hypothesized that smaller scores on the EI dimension would be associated with greater scores on TAO. The obtained correlations between EI and TAO were .03 (ns) and -.04 (ns), for females and for males, respectively. It was hypothesized that greater scores on EI would be associated with greater scores for TAS, PRN, and PRO. The obtained correlations between EI and these three scales were .07 (ns), -.06 (ns), and .08 (ns) for females and -.01 (ns), .16 (ns), and .06 (ns) for males.

TABLE 2

Pearson correlation coefficients between EI scale scores and DMI cluster preference scores

	Females	Males
TAO	.03	-.04
PRO	.08	-.06
PRN	-.06	.16
TAS	-.07	-.01
REV	-.12	-.09

Note. $N = 223$ (Females = 158; Males = 65) TAO = Turning Against Object; PRO = Projection; PRN = Principalization; TAS = Turning Against Self; REV = Reversal. All significance levels are based on 2-tailed tests even though directional hypotheses are proposed in order to reduce probability of Type I error. $p < .05$.

2. Table 3 lists the correlation coefficients between the TF scale scores and the five DMI cluster preference scores. As indicated in Table 3, none of the hypothesized relationships between TF scale scores and DMI cluster preference scores were supported by significant correlation coefficients for either females or for males. It was hypothesized that smaller scores on the TF dimension would be associated with greater scores on TAO, PRO, and PRN. For the females, the obtained correlations between TF and these three DMI cluster preferences (TAO, PRO, and PRN, respectively) were -.01 (ns), -.08 (ns), and -.08 (ns). For the males, the corresponding correlations were -.18 (ns), .01 (ns), and .07 (ns). It was hypothesized that greater scores on TF would be associated with greater scores on TAS and REV. The obtained correlations between TF and these two DMI scales were .07 (ns) and .08 (ns) for females and .17 (ns) and .03 (ns) for males.

TABLE 3

Pearson correlation coefficients between TF scale scores and
DMI cluster preference scores

	Females	Males
TAO	.01	-.18
PRO	-.08	.01
PRN	-.08	.07
TAS	.07	.17
REV	.08	.03

Note. $N = 223$ (Females = 158; Males = 65). TAO = Turning Against Object; PRO = Projection; PRN = Principalization; TAS = Turning Against Self; REV = Reversal. All significance levels are based on 2-tailed tests even though directional hypotheses are proposed in order to reduce probability of Type I error. $p < .05$.

3. The hypothesis concerning EI categorical scores in relation to DMI cluster preference scores were tested by two series of five t -tests, with EI category (group E or group I) used as the predictor variable and the five DMI preference scores used as the outcome variables. One set of t -tests was computed for males, another for females. Levine's test for equality of variance showed no significant group differences, allowing the assumption of equal variances to be accepted, and therefore allowing t -tests to be used.

Table 4 lists the mean scores and the results of the t -tests that tested the hypotheses concerning relationships between EI categorical scores in relation to DMI cluster preference scores. As indicated in Table 4, none of the hypothesized

relationships between EI categorical scores and DMI cluster preferences were supported by statistically significant t ratios for either females or for males. The hypotheses that the E group would show greater scores on TAO than the I group and that the I group would show greater scores for TAS, PRN, and PRO than the E group were not supported.

4. The hypotheses concerning TF categorical scores in relation to DMI cluster preference scores were tested by two series of five t -tests, with TF category (T group or F group) used as the predictor variable and the five DMI preference scores used as the outcome variables. One set of t -tests was computed for males, another for females. Levine's test for equality of variance showed no significant group differences, allowing the assumption of equal variances to be accepted, and therefore allowing t -tests to be used.

Table 5 lists the mean scores and the results of the t -tests testing the hypotheses concerning relationships between TF categorical scores in relation to DMI cluster preference scores. As indicated in Table 5, none of the hypothesized relationships between TF categorical scores and DMI cluster preferences were supported by statistically significant t ratios for either females or for males. The hypotheses that the T group would show greater scores on TAO, PRO, and PRN than the F group and that the F group would show greater scores for TAS and REV than the E group were not supported.

TABLE 4

Comparisons of E group with I group means and the results of t-tests conducted on the DMI preference cluster scores for females and for males

		Females			Males		
		<u>M</u>	<u>t</u> -Score	p-level	<u>M</u>	<u>t</u> -Score	p-level
TAO	E	39.6	-0.19	ns	40.6	-0.15	ns
	I	39.9			41.0		
PRO	E	38.1	-1.28	ns	39.7	-1.28	ns
	I	39.3			41.3		
PRN	E	44.4	0.30	ns	43.9	-0.27	ns
	I	44.1			44.3		
TAS	E	39.0	-0.16	ns	37.1	0.93	ns
	I	39.2			35.5		
REV	E	38.6	1.18	ns	38.5	0.48	ns
	I	37.0			37.6		

Note. $N = 223$. For females, n of E = 94, n of I = 64; For males, n of E = 33, n of I = 32. For females, $df_t = 156$; for males, $df_t = 63$.

TAO = Turning Against Object; PRO = Projection; PRN = Principalization; TAS = Turning Against Self; REV = Reversal.

Results for Hypothesis Testing for the Interaction of EI and TF on DMI Cluster Preferences

A multivariate analysis of variance (MANOVA) was used to test the general hypothesis of an interaction between EI and TF on DMI cluster preference scores.

The MANOVA model is the following: Y (DMI cluster preference scores) = A (EI category) + B (TF category) + AB (EI category \times TF category). One MANOVA was computed for the females, another for the males.

TABLE 5

Comparisons of T group with F group means and the results of t-tests conducted on the DMI preference cluster scores for females and for males

		Females			Males		
		<u>M</u>	<u>t</u> -Score	p-level	<u>M</u>	<u>t</u> -Score	p-level
TAO	T	39.5	-0.17	ns	41.9	1.06	ns
	F	39.8					
PRO	T	38.8	0.30	ns	40.7	0.31	ns
	F	38.5					
PRN	T	44.7	0.51	ns	43.7	-0.68	ns
	F	44.2					
TAS	T	39.0	-0.16	ns	35.8	0.94	ns
	F	39.2					
REV	T	37.6	-0.39	ns	37.8	-0.37	ns
	F	38.1					

Note. $N = 223$. For females, n of T = 49, n of F = 109; For males, n of T = 41, n of F = 24. For females, $df_t = 156$; for males, $df_t = 63$.

TAO = Turning Against Object; PRO = Projection; PRN = Principalization; TAS = Turning Against Self; REV = Reversal.

MANOVA Results for Females

As indicated in Table 6, results of the MANOVA supported the hypothesis of a significant effect due to the interaction of EI x TF for the females [$F(5, 150) = 2.53, p < .03$]. This significant F statistic indicates one or more significant differences among the Quaternary Groups on the DMI cluster preference scores. Univariate ANOVA's show that this significant difference occurred on the REV DMI preference score [$F(1, 154) = 5.62, p < .02$]. Later inspection of group mean differences will indicate the source of this significant interaction and will be discussed later.

The fact that Levene's Test of Equality of Error Variances (which tests the null hypothesis that the error variance of the dependent variable is equal across groups) was not significant conformed to one assumption necessary for the valid use of MANOVA. However, Box's Test of the Equality of Covariance Matrices was significant, indicating that the covariance matrices of the dependent variables are not equal across the groups for the females.

TABLE 6

MANOVA results for females

	Value	F	DF	Significance
Wilk's Lambda				
EI	0.977	0.69	5	ns
TF	0.975	0.76	5	ns
EI x TF	0.922	2.53	5	< .03

Note. $N = 158$

MANOVA Results for Males

As indicated in Table 7, no significant results were obtained for EI, TF or for the EI x TF interaction for the males. Thus, the results of the MANOVA did not support the hypothesis of a significant effect due to the interaction of EI x TF.

The fact that Levene's Test of Equality of Error Variances (which tests the null hypothesis that the error variance of the dependent variable is equal across groups) was not significant conformed to one assumption necessary for the valid use of MANOVA.

However, Box's test of the equality of covariance matrices could not be computed because the data violated certain assumptions (i.e., there were less than two nonsingular cell covariance matrices).

Conclusions about MANOVA Results for Testing the EI x TF Interaction

The Results for the MANOVAs are difficult to interpret because statistical assumptions regarding the MANOVA procedure were violated (i.e., for the MANOVA for females, Box's test of the equality of covariance matrices was significant; for the MANOVA for males, a more serious data problem resulted in an inability to

TABLE 7

MANOVA results for males

	Value	F	DF	Significance
Wilk's Lambda				
EI	0.949	0.78	4	ns
TF	0.978	0.32	4	ns
EI x TF	0.989	0.15	4	ns

Note. $N = 65$

compute Box's test for the equality of covariance matrices). The inability to compute Box's test leads to a conclusion of serious departure from normality in some of the data in the male sample.

Two procedures were employed in an attempt to address the problems in the data in order to provide valid MANOVA tests of the EI x TF interaction. First,

following a procedure based on multiple regression techniques (Hair, Anderson, Tatham, and Black, 1995), a plot of standardized residual scores was obtained for each of the five DMI cluster preference scales. All cases defined as outliers (i.e., cases lying > 2.0 standardized residuals from the regression line) were discarded and MANOVAs were again conducted separately by gender for the 127 remaining females [31 (approximately 19%) were discarded from the original sample due to standardized residuals > 2.0] and 56 remaining males [9 (approximately 14%) were discarded from the original sample due to standardized residuals > 2.0]. However, this removal of outliers did not have the desired salutary effects because Box's test of the equality of covariance matrices was significant again for the MANOVA for females, and, more importantly, there was again an inability to compute Box's test for the equality of covariance matrices for the MANOVA for males.

A second attempt to provide more accurate MANOVA tests of the EI x TF interaction was conducted using factor analytic techniques. In this case, the set of five DMI cluster preference scores for the full sample (TAO, PRO, PRN, TAS, REV) were intercorrelated, factor-analyzed by Principal Component Analysis, and orthogonally rotated using Varimax procedures. Factor scores were computed by using all five of the DMI cluster preference scale factor loadings for each observation, not by the procedure of dropping the DMI scales with weaker loadings. Two major components accounted for 76.6% of the total variance and were retained for rotation. The rotation was based on standard criteria (e.g., latent root > 1.0, percentage of total variance accounted for, and scree plot). Table 8 provides a listing of the factor loadings of the DMI clusters on the two rotated factors. Factor scores were computed for all observations and used as

dependent variables in MANOVAs. Factor scores were used to (1) simplify the DMI clusters, (2) remove much of the dependency between the DMI cluster scores, and (3) provide factor scores of DMI preferences with greater reliability than the individual DMI cluster scores. Factor scores based on the two resultant bipolar factors were used as dependent variables in the subsequent MANOVAs that were computed separately for females and for males.

TABLE 8

Rotated component matrix of the DMI cluster preference scores

	Factor I Aggressive Transformative vs. Aggressive Expressive	Factor II Intrapunitive vs. Extrapunitive
TAO	-.81	-.35
PRO	-.64	-.43
PRN	.82	-.03
TAS	-.01	.99
REV	.87	-.12

Note. $N = 223$. TAO = Turning Against Object; PRO = Projection; PRN = Principalization; TAS = Turning Against Self; REV = Reversal.

Factor I (labeled Aggressive Transformative vs. Aggressive Expressive) is defined by lower scores (lesser reported preference) for TAO and PRO, with concurrent higher scores (greater reported preference) for REV and PRN. The REV and PRN defenses share the theme of dealing with unacceptable impulses by denying or transforming them, while TAO and PRO defenses share the theme of directing

unacceptable impulses, particularly aggression, outwardly. Thus, for Factor I, greater positive factor scores are associated with greater reported preference for PRN and REV, and negative factor scores are associated with a lesser preference for TAO and PRO. Scores on Factor I close to zero are associated with a similar degree of reported preferences for the two sets of defense scores. In short, those who preferred PRN also preferred REV and those who preferred TAO also preferred PRO. Greater negative scores are associated with lesser preference for PRN and REV and with greater preference for TAO and PRO. Factor II (labeled Intrapunitive vs. Extrapunitive) is defined by higher scores (i.e., greater reported preference) for TAS and with less reported preference for TAO and PRO. Negative scores on Factor II would indicate greater preference for TAO and PRO and lesser preference for TAS.

When factor scores based on Factors I and II were used as dependent variables in MANOVAs, no statistical assumptions were violated, neither for the females nor for the males (as indicated by non significant Box test statistics and nonsignificant Levene's test statistics). Because these MANOVA assumptions were not violated, greater confidence can be put in the validity of these MANOVA results.

MANOVA Results Based on Factor Scores for Females

As indicated in Table 9, no significant results were obtained for main effects due to EI, TF nor for the EI x TF interaction for the females. Although a nonsignificant trend ($p < .13$) was obtained for the EI x TF interaction, it is concluded that the results of the MANOVA did not support the hypothesis of a significant effect.

MANOVA Results Based on Factor Scores for Males

As indicated in Table 10, no significant results were obtained for main effects due to EI, TF or for the EI x TF interaction for the males. Thus, the results of the MANOVA did not support the hypothesis of a significant effect due to the interaction of EI x TF.

TABLE 9

Manova results based on factor scores for females

	Value	F	DF	Significance
Wilk's Lambda				
EI	0.997	0.24	2	ns
TF	0.999	0.11	2	ns
EI x TF	0.974	2.01	2	p < .13

Note. N = 158.

TABLE 10

Manova results based on factor scores for males

	Value	F	DF	Significance
Wilk's Lambda				
EI	0.978	0.66	2	ns
TF	0.985	0.44	2	ns
EI x TF	0.993	0.21	2	ns

Note. $N = 65$.

Conclusions for Results of MANOVAs

Results for all three MANOVA series [(1) MANOVA on DMI preference cluster scores, (2) MANOVA on DMI cluster preference scores with outliers removed, and (3) MANOVA on the two DMI cluster factors] were summarized by gender.

For females, the MANOVA conducted on DMI cluster preference scores showed a significant effect due to the EI x TF interaction. Although Box's test was significant for this MANOVA, this was not considered a serious violation, and the significant findings can be interpreted as valid. However, no significant effects were obtained for the two subsequent MANOVAs for females (*viz.*, with outliers removed, with factor scores). Thus, there is "modest" evidence supporting a significant EI x TF interaction ("modest" because it was obtained on only one of the three MANOVAs).

For males, none of the three series of MANOVAs showed significant main effects or interactions. Two series of MANOVAs (on DMI preference cluster scores and on DMI cluster scores with outliers removed) were uninterpretable. The MANOVA conducted on DMI cluster factor scores was interpretable, but the main effects and interaction were not significant.

Results for Hypothesis Tests for the Four Quaternary Groups

Between Quaternary Group Hypothesis Tests

It was hypothesized that each quaternary group would obtain the highest DMI cluster score on specific defense mechanisms.

Table 11 indicates which quaternary group recorded the greatest preference for each of the five DMI cluster scores by gender. The table also provides a listing of which quaternary group was hypothesized to record the highest preference for each of the DMI cluster scores.

For the females, only one of the five hypotheses was supported. As predicted, among the four quaternary groups, the EF females recorded the greatest mean preference score for REV. For the males, two of the six hypotheses were supported, with the ET group reporting the greatest mean preference score for TAO and the EF group recording the greatest mean preference score for REV. Among the five hypotheses concerning the DMI cluster preferences of the quaternary groups, only the hypothesized relationship between EF and REV was supported for both genders.

All possible pairs of quaternary group DMI cluster preference mean scores for each of the five DMI cluster preferences were tested for statistical significance using least significant difference (LSD) post hoc tests. Thirty LSD post hoc tests were

conducted for the males and 30 for the females. Each set of 30 tested the significance of all possible non-redundant pairwise quaternary group difference (ET vs. EF, IT, IF; EF vs. IT and IF; IT vs. IF) for each of the five DMI cluster preferences (TAO, PRO, PRN, TAS, and REV). For the females, only one of the thirty group differences was statistically significant (for REV the EF group showed a significantly greater mean score than the IF group (mean difference = 3.69, $p < .01$). For the males, none of the 30 group differences was statistically significant. Because the one significant group mean difference for the females was based on a total of 60 statistical tests, the single significant group difference is best interpreted as the result of chance.

Within Quaternary Group Hypothesis Tests

It was hypothesized that, when the DMI preference cluster mean scores were rank ordered within each quaternary group, the most preferred DMI cluster for each group would be IF and TAS, IT and PRO and PRN, ET and TAO, and EF and REV. Table 12 provides a rank order listing of the DMI cluster preference mean scores for each quaternary group for females and for males.

For the females, each of the four Quaternary groups recorded the greatest preference for PRN. Although one of the five hypotheses was supported (IT group showing greatest preference for PRN), it might best be viewed as simply due to chance because all four groups similarly recorded the highest preference for PRN. For the males, each of the four quaternary groups similarly recorded the greatest mean preference for PRN. Again, it is clear that the quaternary group variable had no differential effect upon the most preferred DMI cluster preference because all four quaternary groups most strongly preferred PRN.

TABLE 11

Highest scoring quaternary group on each of the five
DMI clusters for females and males

DMI Cluster	Hypothesized Greatest Mean Preference Score	Actual Greatest Mean Preference Score	Mean Preference Score
Females (n = 158)			
TAO	ET	IF	40.1
PRO	IT	IF	39.5
PRN	IT	ET	45.1
TAS	IF	ET	40.3
REV	EF	EF	39.5
Males (n = 65)			
TAO	ET	ET	42.1
PRO	IT	IF	41.4
PRN	IT	IF	45.1
TAS	IF	EF	38.6
REV	EF	EF	39.3

Note. N = 223. IF = Introversion Feeling; IT = Introversion Thinking
ET = Extraversion Thinking; EF = Extraversion Feeling;
TAO = Turning Against Object; PRO = Projection; PRN = Principalization;
TAS = Turning Against Self, REV = Reversal.

TABLE 12

Rank order listing of DMI cluster preference mean scores within each quaternary group for females and males

Females (n = 158)											
<u>ET (n=27)</u>			<u>EF (n=67)</u>			<u>IT (n=22)</u>			<u>IF (n=42)</u>		
<u>Rank</u>	<u>DMI</u>	<u>Mean</u>	<u>Rank</u>	<u>DMI</u>	<u>Mean</u>	<u>Rank</u>	<u>DMI</u>	<u>Mean</u>	<u>Rank</u>	<u>DMI</u>	<u>Mean</u>
1	PRN	45.1	1	PRN	44.2	1	PRN	44.2	1	PRN	44.1
2	TAS	40.3	2	TAO	39.7	2	TAO	39.6	2	TAS	40.2
3	TAO	39.5	3	REV	39.5	3	REV	39.2	3	TAO	40.1
4	PRO	38.7	4	TAS	38.5	4	PRO	38.9	4	PRO	39.5
5	REV	36.2	5	PRO	37.8	5	TAS	37.4	5	REV	35.9
Males (n = 65)											
<u>ET (n=20)</u>			<u>EF (n=13)</u>			<u>IT (n=21)</u>			<u>IF (n=11)</u>		
<u>Rank</u>	<u>DMI</u>	<u>Mean</u>	<u>Rank</u>	<u>DMI</u>	<u>Mean</u>	<u>Rank</u>	<u>DMI</u>	<u>Mean</u>	<u>Rank</u>	<u>DMI</u>	<u>Mean</u>
1	PRN	43.6	1	PRN	44.3	1	PRN	43.8	1	PRN	45.1
2	TAO	42.1	2.5	PRO	39.3	2	TAO	41.7	2	PRO	41.4
3	PRO	40.0	2.5	REV	39.3	3	PRO	41.3	3	TAO	39.8
4	REV	38.1	4	TAS	38.6	4	REV	37.6	4	REV	37.7
5	TAS	36.1	5	TAO	38.3	5	TAS	35.4	5	TAS	35.8

CHAPTER 4

DISCUSSION

This research explored the relationship between two psychological type dimensions (extraversion-introversion and thinking-feeling) operationalized by the MBTI and defense mechanism preferences operationalized by the DMI. Extraversion-introversion and thinking-feeling were combined into the formation of a quaternary personality model. Hypotheses were tested that certain quaternary groups would display specific theoretically expected relationships with defense mechanism preferences. However, only four of the hypotheses were supported by the data: (1) for the females, a significant effect due to the interaction of EI x TF on DMI cluster preference scores was obtained; (2) following a significant univariate ANOVA for females on REV, a comparison of group means showed that the EF females, as hypothesized, recorded a higher score on REV than the other three female quaternary groups (In fact, the mean REV score of the EF group was significantly greater than the mean REV score of the IF group); (3) for both females and for males, the IT quaternary group's most preferred defense mechanism was PRN; and (4) for the males, as hypothesized, the ET group recorded a higher score on TAO than did any other quaternary group. However, because all eight quaternary groups (four for males, four for females) similarly reported the greatest preference for PRN, these results cannot be taken as unambiguous support for

the hypothesis that the IT group would prefer PRN. That is, the IT groups similarly recorded the greatest preference for PRN, as did the other three quaternary groups.

Due to the large number of significance tests performed (e.g., 60 LSD post hoc tests alone) and the resulting probability of Type I error, as well as the general lack of support for hypotheses, these significant findings must be interpreted with great caution. Indeed, the clearest findings of this investigation are the nearly total lack of support for hypotheses.

*Hypotheses Concerning EI Scores, TF Scores,
and DMI Cluster Preferences*

Extraversion-Introversion

It was hypothesized that a preference for extraversion would be associated with a preference for defensive clusters that emphasize externally directed expression of cognition, affects, and behaviors. It was further hypothesized that a preference for introversion would be associated with a reported preference for defense clusters that emphasize internally directed expressions of cognitions, affects, and behaviors. None of these hypotheses were supported by significant findings. Perhaps the attitude or preferred direction of attention (as indicated by EI) is unrelated to the use of defenses. It could be argued that because individuals have an inborn preference for one of the two attitudes (Jung, 1921/1990) and that because defense mechanisms depend on level of functioning, the attitudinal preference and defensive preference are relatively independent, and therefore there is no overall pattern in persons functioning within the "normal" range. Perhaps the hypothesized relationships exist, but only emerge during stressful or psychopathological conditions.

Thinking-Feeling

It was hypothesized that a preference for thinking would be associated with defenses that involve “splitting” or “distancing” the emotional content of threatening experiences from the cognitive content. Further, it was hypothesized that a preference for feeling would be associated with defensive processes involving the self-experience and self-directedness of negative emotions resulting from threatening situations. Again, none of the hypotheses concerning TF and DMI cluster preferences were supported by significant findings. Perhaps TF is unrelated to one’s use of defense mechanisms.

For both females and for males, the hypotheses concerning relationships between EI scores and DMI cluster preference scores were supported neither by significant predicted correlation coefficients nor by significant mean differences between the extraverted versus introverted groups. Also, for both females and for males, none of the hypothesized relationships between TF scale scores and DMI cluster preferences were supported by significant predicted correlation coefficients nor by significant mean differences between the thinking versus feeling groups. Perhaps the DMI scenarios did not activate enough stress or threat in the classroom setting to engage defensive operations. It is possible that administration in a large group setting had confounding effects on extraverts and introverts. Perhaps extraverts were overly distracted and introverts were uncomfortable and their responses, therefore, were not valid.

Hypotheses Testing for Interaction of EI and TF on DMI Cluster Preferences

Results of the MANOVA supported the hypothesis of a significant effect due to the interaction of EI x TF for females. Univariate ANOVA’s showed that the source of

this significant difference was on the REV DMI preference score. In terms of testing the assumptions allowing the use of MANOVA, Levene's Test of Equality of Error Variances (which tests the null hypothesis that the error variance of the dependent variable is equal across groups) was not significant, conforming to one assumption necessary for the valid use of MANOVA. However, Box's test of the equality of Covariance Matrices was significant, indicating that the covariance matrices of the dependent variables are not equal across the groups for the females. However, the Box test is very sensitive and just because the results are significant, it does not necessarily mean that the significant multivariate test is invalid. At best, there is only minimal support for the interaction of EI and TF on DMI cluster preferences because the finding is limited to females only on one of the five defensive clusters.

*Hypotheses Based on Quaternary Groups
and DMI Cluster Preferences*

Introverted Feeling Quaternary

It was hypothesized that the IF type would tend to direct negative emotions toward the self, which would correspond to a preference for the defensive cluster of TAS. This hypothesis was not supported. The IF females recorded the greatest preference for PRN, with TAS the second most preferred DMI cluster. The IF males recorded the greatest preference for PRN, with TAS being their least preferred DMI cluster. Perhaps the normal individual uses many defense mechanisms and does not rely significantly more on one than on another.

Introverted Thinking Quaternary

It was hypothesized that the IT type would tend to employ a detached, objective approach, analytically splitting affect from cognitions, therefore tending to prefer PRN

and PRO defenses. Although the IT quaternary group for both females and males did record the greatest preference for PRN among the five DMI preferences, this finding cannot be taken as unequivocal support for this hypothesis because all eight quaternary groups (four male groups and four female groups) reported greatest preference for PRN. In the case of PRO, hypotheses were not supported because PRO was the fourth and the third most preferred defense for the IT females and males, respectively.

Extraverted Feeling Quaternary

It was hypothesized that the EF type would prefer to focus on the positive and tend to ignore negative information and therefore prefer REV. Indeed, when compared to the other three quaternary groups, both female and male EF types, showed the highest mean preference score for the REV defense mechanism cluster. Individuals scoring high on both extraversion and feeling, EF types, tend to be optimistic about both life and human potential (Quenk, 1993a). They prefer to focus on the positive and tend to ignore negative or pessimistic information (Quenk, 1993a). These characteristics correspond with the defense mechanism of REV. Doyle (1999) labels the EF quaternary as "expressive," because EF's tend to be relatively expressive of feelings and relatively social and optimistic. When subject to severe psychopathology, the EF tends to be diagnosed as narcissistic, manic, or hysteric. This type tends to direct emotions and affects externally, in an exaggerated fashion, which again supports the hypothesized usage of REV defenses, specifically, reaction formation. Although the EF group showed the greatest preference for REV among the four quaternary groups, this finding must be tempered by the finding that REV is the third most preferred DMI cluster for

the EF groups. The EF groups recorded higher scores, thus indicating greater preference for PRN and either TAO for females or PRO for males.

Extraverted Thinking Quaternary

It was hypothesized that ET types would tend to display defenses that involve forcing the outer world to conform to their wishes, directing aggression outwardly to achieve his or her goals. Preference for ET was expected to correspond to reported preference for the TAO defense cluster. The hypotheses, however, were not supported by the data. TAO was the third most preferred defensive cluster for females and the second most preferred cluster for males. Although TAO was the second most preferred cluster for the ET males, it is noted that the mean TAO preference score for the ET males was highest among the quaternary groups. Again, it may be that the healthy ET is able to use of variety of defensive mechanisms.

Perhaps individuals with abnormal personalities use defense mechanisms differently from those with normal personalities. If that is the case, then perhaps the DMI, which has been used successfully with abnormal personalities, fails to tap the use of defense mechanisms in normal individuals. Perhaps the use of relatively effectively functioning college students results in a restriction of range in defensive functioning and preferences. As individuals mature, their defensive preferences may become more differentiated and clearer. Ihilevich and Gleser (1993), however, report PRN as the preferred defense for both males and females in the general population.

All eight groups showed the greatest preference for PRN. Ihilevich and Gleser (1993) reported the typical pattern for males is a preference for PRN followed by TAO and PRO. The typical pattern for females is a preference for PRN followed by TAS.

Consequently, the sample in the present study is consistent with the typical findings for college students. Because intellectual defenses are anchored in reality and give the appearance of self-control, they are often considered a preferred mode of response in our society. It follows that college students who are being trained to think objectively and analytically would tend to prefer the PRN defense cluster.

Relationships Between Threats to Internal Validity and Findings

In this section, each of the nine classic threats to internal validity (Campbell & Stanley, 1990) will be discussed, and the way they may have confounded this study will be examined.

Selection

Selection involves the dispositional and group membership characteristics participants bring to the study with them. This includes characteristics such as sex, height, weight, attitude, and personality.

It may be that because of the sample's age ($M = 23.05$ years) and resultant lack of maturity and homogeneous social status (i.e., as college students), there may have been a lack of differentiation for both psychological type and DMI preference.

According to Jung, psychological development is a lifelong pursuit, and many persons may not display differentiated type preferences until later adulthood, with some persons never displaying clearly differentiated preferences. The same notion applies to defense mechanism preferences. There may be a process of differentiation associated with age and maturity. It is possible that lack of differentiation both in type and in defensive preference could be implicated in the lack of significant results. It is clear that there was a homogeneity of DMI preferences, with all eight quaternary groups (i.e., the four

quaternary groups for each gender) recording the greatest preference for PRN. This systematic preference for PRN is consistent with the notion that college students have a more intellectual orientation than much of the general population.

Traditionally, males are socialized to be more outwardly aggressive than females and such findings manifest themselves on the DMI with males often scoring higher on TAO and PRO (Ihilevich & Gleser, 1993). In this study, males scored highest on PRN, with TAO and PRO typically being the second or third highest for each quaternary group. There are several findings relevant to selection that concern age as well (Ihilevich & Gleser, 1993). One such finding suggests that as people grow older relatively mature defenses, such as sublimation and humor, replace relatively immature defenses, such as projection and denial. This study examined the constructs of EI and TF without addressing the influence of age differences.

History

History refers to outside events that may occur during the experiment that could influence the dependent or outcome variable. Because defense mechanism preference, as measured by the DMI, and personality type, as measured by the MBTI, are considered stable variables, history should not be a concern in the present study. No unusual macro-events that could have influenced defensive preference (e.g., such as the September 11th terrorist attack) occurred during the time when testing was being conducted.

Maturation

Maturation refers to changes in the participants during the course of the experiment that could affect the dependent or outcome variable. Since the instruments

were administered sequentially during one class session or, at the most, two days apart, maturation is not considered a viable threat to internal validity.

Repeated Testing

Repeated testing refers to scores on the dependent variable being affected by repeated testing of the same variable. Contamination from repeated testing is not a significant issue, particularly because the content of the assorted instrument items are not clearly related and the hypotheses were not known to the respondents. Also, the order of administration of the two self-reports was counterbalanced.

Instrumentation

Instrumentation refers to the reliability of the instruments. As stated earlier, the reliabilities of the instruments (MBTI and DMI) are satisfactory. The two instruments are considered “among the best” measures of their respective constructs, psychological type and defensive preference. These two instruments possess the best reliabilities of their genres. The nonsignificant results, therefore, are not likely to be attributed to the instruments used in this study.

Regression to the Mean

Participants with extreme scores on a first measure of the dependent variable tend to have scores closer to the mean on a second measure due to greater unreliabilities of their initial scores. Although subjects were not repeatedly tested on the same instruments in this study, those participants with outlier scores were deleted from the analysis in the present study in an attempt to enhance primary variance (and reduce error variance) in one additional analysis.

Experimental Mortality

Experimental mortality occurs when subjects drop out before the investigation was completed. There was no experimental mortality in the current study.

Selection-Maturation Interaction

Selection-maturation interaction occurs when participant-related variables and time-related variables interact. Again, since maturation is not an issue for this study, the selection-maturation interaction is not an issue either.

Experimenter Bias

Experimenter bias occurs when expectations of the experimenters significantly influence the outcome. Since the assessment instruments were objective pencil and paper tests and since the experimenter did not obtain the scores until after the administration, experimenter bias is not a concern in the present study.

Strengths

The two instruments used as measures of psychological type (MBTI) and defense mechanism preference (DMI), respectively, display strong psychometric properties such as reliability and validity. The instruments were age appropriate and reading-level appropriate for the sample. There was little experimental mortality.

When there was evidence that some of the data, particularly for males, violated multivariate assumptions, two full data transformations and reanalyses were performed to compensate for these violations. First, removal of outliers was performed, then, computation of factor scores, which were subsequently used as measures of DMI preferences, was employed.

Limitations

There are several limitations of the present study in addition to those discussed concerning internal validity. The relatively small sample size for males is one possible limitation. Another limitation, as mentioned above, involves the composition of the sample itself. This study was conducted using college students. Consequently, the results should be generalized with caution to populations other than post-secondary institutions and young adults until similar research involving other populations is conducted. Those high in PRN, as characteristic of college students, tend to display an internal locus of control and are likely to be more verbally fluent and intelligent than those with low PRN scores (Ihlevich & Gleser, 1993a). The possibility that the test population had a greater internal locus of control and was more verbally fluent and intelligent than a more varied population may explain why all groups in this sample scored highest on PRN.

Social desirability may be another possible explanation for the high PRN scores. Many of the PRN responses are the most socially desirable. It's possible that the college students were overly aware of presenting themselves in a favorable light.

Ware, Rytting, and Jenkins (1994) found that students moved toward I, S, and T under stressful conditions regardless of their previous psychological type preference scores. It seems that under stress, individuals are (1) moving attention from the external world to the internal, subjective world, (2) becoming more concrete and fact-oriented in perception, and (3) distancing themselves from emotions. This set of strategies may have implications for the present study. If individuals mobilize resources by focusing on the self, focusing on facts, and controlling emotions, this could be reflected in their

use of defenses. These individuals would tend to move in the direction of the IT type which would, in turn, move them in the direction of PRN. This movement is somewhat supported (though not significantly) by the results of the present study.

If, as Cooper and Kline (1982) suggested, defense mechanisms are by nature unconscious and thus capable of unexpected reality distortions, the notion of accurately self-reporting defense mechanisms may be unlikely at best. Perhaps a method of assessing defense mechanisms more aligned with the projective hypothesis central to Freudian psychoanalysis, such as the Rorschach Test or a behavioral method of observing the use of defense mechanisms in subjects such as Perry's (1990) Defense Mechanism Rating Scales, would have more valid results. As suggested by Cramer (1999), it is possible that findings from research with patient samples might not generalize to nonclinical samples. If Cramer is correct, perhaps the notion of bridging the gap between normal and abnormal personality research is more problematic than previously thought. As concluded by Berman and McCann (1995), it may be more adaptive to use separate inventories to measure each specific attribute of personality whether it is defense mechanisms or interpersonal relationships.

Future Research

Future research should involve larger sample sizes in order to detect more subtle effects among variables. In addition, future research should take a developmental perspective and should involve older, more mature participants. Older persons with a presumably clearer differentiation of perception or judgment are more likely to be clear about their own type and defensive preferences (Cramer, 1999). They, therefore, may report their preferences more accurately. If this assumption is correct, samples of more

mature persons might show results more in line with the hypotheses than samples of younger persons. Further, it is expected that samples of persons with higher achievement levels will report their preferences more consistently (Myers & McCaulley, 1985).

Future research could also use different instruments to assess psychological type and defensive preference, specifically trait instruments. Although the MBTI fits well with the quaternary model, perhaps a personality assessment instrument based upon the trait model such as the NEO-PI-R would better tap the constructs of EI and TF. Indeed, McCrae and Costa (1989) argued that the MBTI should be avoided by those who embrace Jung's theory. It is also possible that the MMPI-2 could be considered as an option for future research. The MMPI-2 may be a better instrument for bridging the gap between normal and abnormal, as the MMPI-2 is well established in both domains of the literature. Specifically, the MMPI-2 scores could be used to evaluate the degree of maladjustment or stress and then those scores could be combined with EI and TF. In this case, an additional variable, degree of maladjustment, could be used as a moderator of the relationship between personality type and defensive preferences.

Observer-rated measures of defense mechanisms are the direct lineal descendants of Freud's clinical proposition that an observer can infer defensive operations in an individual of which the individual himself or herself is unaware (Perry & Ianni, 1998). As Vaillant (1998) put it, "defenses, like rainbows, and unlike flying saucers, can be photographed on videotape." Thus, observer-rated measures of defenses might be more valid than self-report measures.

Summary

This study investigated the relationships between two psychological type dimensions (extraversion-introversion and thinking-feeling) operationalized by the MBTI and defense mechanism preferences operationalized by the DMI. Although some modest support for hypotheses was found (e.g., significant EI x TF interaction for females, IT group preference for PRN for both males and females, and a tendency for the EI group to prefer REV, and high score on TAO for ET males), it is concluded that EI, TF, and the combination of these personality dimensions into a quaternary group model did not, on the whole, demonstrate the hypothesized relations to defense mechanism preferences.

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APPENDIX
HUMAN SUBJECTS CONSENT FORM

HUMAN SUBJECTS CONSENT FORM

The following is a brief summary of the project in which you have been asked to participate. Please read this information before signing the statement below.

TITLE: Psychological Type and Defense Mechanisms.

PURPOSE OF STUDY: To determine the relationship, if any, between psychological type and defense mechanisms.

PROCEDURE: Students will voluntarily complete a packet of self-report inventories.

INSTRUMENTS: The instruments used to collect data for this study are a defense mechanisms inventory and a personality type indicator.

RISKS/ALTERNATIVE TREATMENTS: There are no risks associated with participation in this study. Participation is voluntary.

BENEFITS/COMPENSATION: None

I, _____, attest with my signature that I have read and understood the description of the study, "Psychological Type and Defense Mechanisms," and its purpose and methods. I understand that my participation in this research is strictly voluntary and my participation or refusal to participate in this study will not affect my relationship with Louisiana Tech University or my grades in any way. Further, I understand that I may withdraw at any time or refuse to answer any questions without penalty. Upon completion of the study, I understand that the results will be freely available to me upon request. I understand that the results of my survey will be confidential, available only to the researchers, myself, or a legally appointed representative. I have not been requested to waive nor do I waive any of my rights related to participation in this study.

Signature of Participant

Date

CONTACT INFORMATION: The researchers listed below may be reached to answer questions about the research, participants' rights, or related matters.

Kathryn Kelly	257-4315
Dr. Jerome Tobacyk	257-4315

The Human Subjects Committee of Louisiana Tech University may also be contacted if a problem cannot be discussed with the researchers.

Dr. Mary Livingston	257-4315
Dr. Terry McConathy	257-2924