THE RELATIONSHIP BETWEEN PSYCHOLOGICAL TYPES
AND EGO DEFENSE MECHANISMS:
A CORRELATIONAL STUDY

by

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We accept this thesis as conforming
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ABSTRACT

This research project is an exploration of the relationship between psychological types, as derived from Carl Gustav Jung's theory, and ego defense mechanisms, as conceptualized by psychoanalytical theorists ranging from Sigmund and Anna Freud to George Vaillant. The two sets of constructs (4 bipolar typological dimensions and 24 defense mechanisms) were measured using two established self-report instruments: the *Myers-Briggs Type Indicator – Form M* (MBTI) and the 88-item *Defense Style Questionnaire* (DSQ).

Recruited mostly from a university setting, 213 participants completed the two instruments and answered a few basic demographic questions regarding their age, gender, and education.

Given the differing reports in the literature regarding the psychometric characteristics of the DSQ, a principal components analysis was used in Study 1 in order to identify the factor structure of the instrument based on this sample. That preliminary study revealed three conceptually meaningful factors identified as: *Maladaptive Defense Style, Neurotic Defense Style,* and *Adaptive Defense Style.*

In Study 2, hierarchical multiple regression analysis was used to identify the contribution made by the psychological type variables and the demographic variables (as predictors) to the explanation of variance in participants' scores on each defense factor and each defense mechanism (as outcome). As hypothesized, knowledge of participants' psychological type increased the ability of regression models to explain and predict respondents' scores on the ego defense measure, when compared to models based only on the demographic variables.
Among the significant findings: the Sensing – Intuiting dimension discriminated between the Maladaptive and the Adaptive Defense Styles, with higher Sensing scores being associated with higher scores on the Maladaptive Defenses, such as: Hypochondriasis, Isolation of Affect, Projection, and Splitting. Higher scores on Intuition were associated with higher scores on the Adaptive Defenses, such as: Humour, Sublimation, and Suppression. Introversion was positively associated with the Maladaptive Defense Style, as were the responses of younger participants. The Thinking – Feeling dimension discriminated between lower and higher scores, respectively, on the Neurotic Defense Style. Gender differences were also identified, with males scoring higher on Denial, Isolation of Affect, Omnipotence-Devaluation, and Splitting, as well as on the Maladaptive Defense Style in general. No clinically significant interaction effects were detected.

Implications for clinical practice and future research directions are also discussed.
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DEDICATION

I would like to dedicate this doctoral dissertation
to the memory of my parents, Claudia and Victor.
CHAPTER 1: GENERAL

Introduction

From a general perspective, this research project connects two areas of interest in the study of personality: the analysis of *ego defense mechanisms* and the exploration/description of *personality types*. Conceptually and historically, these two areas of research share some common background.

One of those common points is that both the study of ego defense mechanisms and that of personality types have been the focus of interest for psychodynamically oriented researchers and theorists. The systematic study of ego defense mechanisms originated with the psychoanalytic work of Sigmund Freud and was immediately continued in the seminal work of Anna Freud (1964). Since then, there have been some fluctuations in the interest that the psychoanalytic school has taken in this area. Today however, there seems to be a strong resurgence of the interest in the concept of ego defenses and its application to counselling and psychotherapy (Conte & Plutchik, 1995; Cramer, 2000). The interest in personality types, on the other hand, has enjoyed a much longer tradition, that can be traced back to the ancient Greek philosophers. In the more recent history of “scientific” psychology, a comprehensive theory of personality types has been proposed by Jung (1921/1971). Since the publication of *Psychological Types*, the Jungian typological theory has enjoyed continuous appreciation and interest from researchers and practitioners alike. In spite of their technical differences, Freudian psychoanalysis and Jungian analytical psychology share a significant number of basic psychodynamic principles. On the occasion of the first ever conference held between
psychoanalysts and analytical psychologists in the USA, scholars have recently noted the
trend towards rapprochement between the two schools (Beebe, 1997; Kirsch, 1997).

The other important commonality between the areas of typology and defense
mechanisms is the study of individual differences in personality. The interest in
personality factors (whether types or traits) has generated a wealth of research in the field
of measurement and assessment of personality structures. Any study of individual
differences in personality relies, implicitly or explicitly, on an underlying
conceptualization of personality structures. In bringing together psychological types and
ego defense mechanisms (the latter being more akin to traits), this research project
subscribes to Eysenck’s (1957) hierarchical model of personality structure as explained
by Romney and Bynner (1992). The habitual- and specific-response levels in the
hierarchy correspond to the items found in personality inventories and rating scales.
These items correlate with each other and the matrix of correlations gives rise to factors
(i.e., types) and traits. “Hence, trait levels are designated as *first-order factors* and type
levels as *second-order factors*” (Romney & Bynner, 1992, p. 50).

**Purpose of the Study**

The main purpose of this research project was to investigate the relationship
between psychological types (such as introversion, extraversion, thinking, feeling, etc.)
and ego defense mechanisms (such as denial, reaction formation, sublimation, etc.) in a
sample drawn from a non-clinical adult population. In other words, the main research
question was whether certain personality types, as defined by the Jungian type theory
(Jung, 1971), are more prone than others to employ certain ego defense mechanisms as a
means of coping and relating in adult life. This researcher examined a relatively large
sample of a non-clinical adult population using a quantitative methodology format
(multiple regression analysis), through the participants' responses on two psychometric
instruments: the *Myers Briggs Type Indicator* (MBTI) (Briggs & Myers, 1998) and the
*Defense Style Questionnaire* (DSQ) (Bond, 1991).

Since the DSQ is a relatively new measure, the other purpose of this research
project was to conduct a replication study of the factorial structure of that instrument.
This was done in a preliminary study, entitled *Study 1*. Thus, Study 1 served to identify
the defense-related variables based on which the correlational analysis in Study 2 could
be performed.

In more specific terms, the purpose of *Study 2* was to identify the individual
contribution made by any of the typological dimensions, or combinations thereof, to the
explanation of variance in the participants' scores on the defense measure. Both main
effects and interaction effects were examined. In addition, this researcher explored the
role played by a number of demographic variables (*Age, Gender, and Education*) as
possible moderators in the explanation of variance in defense organization. The goal of
the statistical analysis was to reach the most parsimonious explanatory models that would
account for the observed associations between personality types and defense structures.

Insofar as the variables under examination are concerned, this is a pioneering
study. To this researcher's knowledge, no previous study has attempted to explore the
possible association between the Jungian psychological types and defensive functioning.
A review of the two theories suggested some potential associations, but those suggestions
were in need of both empirical and conceptual validation. In that sense, this study aimed
at formulating more comprehensive definitions of both psychological types and ego
defense mechanisms, which would reflect the possible areas of conceptual overlap.

It is believed that a clearer understanding of the possible association between
personality types and ego defense mechanisms will contribute significantly to increasing
the effectiveness of psychodynamically oriented assessment and clinical interventions in
counselling and psychotherapy.

**Rationale for the Study**

Both the study of psychological types and the analysis of defense have been
shown to be of great relevance in their respective areas or schools of counselling and
psychotherapy. The study of typological structures of personality has been identified as
the cornerstone of therapeutic interventions geared towards increased self-awareness and
the process of individuation (Hopke, 1989; Meier, 1989; Singer, 1994; von Franz, 1993).
While, traditionally, the analysis of defense has been one of the key therapeutic avenues
in psychoanalytically oriented counselling, its relevance has been augmented with the
appearance of a number of short-term dynamic approaches to psychotherapy (Della
Selva, 1996; Devanloo, 1980, 1990). After a careful examination of the literature in these
two fields, a gap in the existing research was identified, i.e., the fact that no study has yet
explored the possible association between typology and ego defenses.

At the theoretical level, the study of patterns of association between personality
types and defense mechanisms has the potential of informing our understanding of both
these sets of constructs and may lead to the formulation of more pertinent and exhaustive
definitions. A more refined conceptual framework of the relationship between ego
defenses and psychological types would also represent an important contribution to both
the study of personality and the field of developmental psychology. The relationship
between these two sets of constructs can help future research address the issue of possible
underlying developmental (hence chronological) factors involved in the formation of
psychological types and defensive organization.

On a more practical level, through the integration of both cognitive and
psychodynamic elements, the analysis of defense can act as a shortcut to an otherwise
lengthier therapy process. As Clark (1998) explained, “once specific mechanisms are
detected, a major counseling issue then becomes whether maladaptive defenses should be
relinquished, worked around, or in some way replaced with more effective strategies
[...]. Counseling interventions may be intentionally employed to identify and modify
client defenses in adaptive directions” (p. 6).

Another area of great interest in counselling is that of therapy outcome research.
In that sense, the assessment of changes in defensive responding during various stages of
the counselling process can provide a meaningful index of client change. In the
counselling and psychotherapy literature reviewed by this author, there are very few
studies dealing with treatment and outcome issues around ego defenses. That omission
has been noted by Davidson and MacGregor (1996), albeit in a parenthesis. Referring to
the assessment of changes in defense mechanisms over the course of therapy, Davidson
and MacGregor recognize that this is “often an implied goal of psychotherapy that is not
systematically measured or investigated” (p. 637). Therefore, a systematically observed
positive change in a client’s use of a range of preferred defense mechanisms (i.e., from
less adaptive defenses to more adaptive ones) can be seen as an index of positive
counselling outcome. Throughout the research literature on both psychological types (Jung, 1971; Hammer, 1996; Myers & McCaulley, 1985) and defense mechanisms (Freud, 1964; Sandler & Freud, 1985; Vaillant, 1993), it has been pointed out that psychological types appear to have a very enduring quality, across the span of adult life, while defenses are relatively more amenable to change. As such, the results of this study have the potential of informing the counselling process with respect to the evaluation of therapy outcome: an observable positive outcome can be a change from maladaptive to adaptive defenses within the range predicted for that particular psychological type.

The relevance of this study for the practice of counselling psychology is enhanced by the non-clinical nature of the sample under examination. Recently, there has been an increased recognition of the functional positive role played by ego defenses in adjustment and adaptation (Vaillant, 1993). Hence, the applications of the analysis of defense have extended beyond the realm of psychiatry to that of counselling. Clark's (1998) recent contribution to the study of defense mechanisms in the counselling process integrates the analysis of defense into an eclectic model of psychotherapy. His model follows the generic three-stage approach (initial or relationship stage, middle or integration period, and final or accomplishment stage) and the importance of the analysis of defense mechanisms is explored at each of those stages. As Clark states, "although defense mechanisms represent only one dimension of individuals' functioning, the constructs are integral to broad forces in human development and psychopathology and are essential considerations in the counselling process" (p. 22). In working with clients, the instilment of more mature and constructive defenses could be incorporated into the larger counselling strategy of facilitating the clients' process of individuation.
Through the analysis performed in Study 1, this project represents an important contribution to the validation efforts currently undertaken in the research on and with the Defense Style Questionnaire. There is a clear consensus among researchers regarding the importance of replication studies (Kazdin, 1992; Rosnow & Rosenthal, 1984), particularly in the process of validation of a relatively new measure. The results of the current replication study have implications in the area of personality assessment, as well as counselling and psychotherapy. In addition, this research project made an original contribution with the examination of the Social Desirability Scale included in the DSQ. Surprisingly, in spite of its inclusion in the DSQ, the Social Desirability Scale has never been the object of any previous research in terms of its factor structure, psychometric properties, or meaning and interpretation.

Finally, the intersection between the study of psychological types and the analysis of defense can have great predictive usefulness. Based on the relationship between psychological types and ego defense mechanisms or defense styles, it may be easier to assess and describe a wider range of personality structures. In turn, this can lead to the use of more parsimonious assessment strategies and more time-effective interventions in counselling.

Limitations of the Study

One limitation of this study has to do with limitations inherent in the assessment instruments used. Arguments have been presented in this study to support the idea that the MBTI and the DSQ are the most psychometrically robust instruments measuring the constructs of interest. Nevertheless, the psychometric properties of the DSQ, while at an
acceptable level, do not reach the same high standards of reliability and validity that characterize the MBTI. In order to minimize measurement error, this researcher has utilized a number of statistical strategies, such as correction for attenuation and model specification. In addition, caution has been exercised when interpreting results based on less reliable scales. This author believes that only continuous and systematic research using a given instrument can lead to the identification of those areas of relative weakness and the solutions for improvement.

Another limitation of this study consists in the reliance on a sample of convenience. As is the case with much of the research in psychology, often researchers have to accept a compromise between ideal conditions and the practical exigencies of circumstance. In order to minimize the impact of this limitation, the sample characteristics have been fully described and the interpretation of results has taken into consideration the nature of the given population sample. Therefore, given the non-clinical nature of this sample, no inferences can be made about the generalizability of these results to psychiatric populations.

Finally, one other limitation of this study is the mono-method bias. Very much in keeping with its pioneering nature, this study has been intended as an empirical first step towards a theoretical convergence between the two sets of constructs. Based on the observed associations between defensive organization patterns and psychological types, future research can address the issue of methodological bias by combining two or three methods of exploration. Methodological triangulation has already been proposed as a possible avenue for future research on defense mechanisms. In his review of the existing research on ego defense mechanism, Vaillant (1986) identified two types of limitations:
"Thus, if the clinical studies were unsatisfactory methodologically, so the methodological studies were unsatisfactory clinically" (p. xii). In other words, the debate between quantitative and qualitative methods could be viewed as a trade-off between reliability and validity, respectively. Vaillant suggested that a combination of methods might pave the way towards increased rigor in terms of validity and reliability. "We cannot measure a mountain from top to bottom, but we can assess its height through triangulation, by integrating two indirect and oblique views of its peak" (p. xvii). As examples of such combined methodologies, various combinations have been suggested: paper-and-pencil self-report questionnaires paired with clinical interviews, or a combination of biography, autobiography, and the examination of the subject's symptoms or creative products.

**Overview of the Research Project**

This research document has been organized into five chapters. Chapter 1 has focused on the purpose of and rationale for this research project, as well as the limitations involved in this study. Chapter 2 provides a literature review and concludes with the identification of a gap that exists in the current research on psychological types and defense mechanisms, leading to the formulation of the main research questions. Chapter 3 is a description of the methodology used in this study including: procedure for data collection, description of the sample, basic properties of the instruments used, as well as comments on current definitions. Chapter 4 is a description of the analyses and results, and has been organized into two main studies: Study 1 is an exploratory factor analysis performed on the participants' responses to the DSQ; building on the results of Study 1, Study 2 describes the correlational analyses used in order to identify the relationship
between psychological types and ego defense structures. Chapter 5 covers the interpretation of results as well as implications for counselling and recommendations for future research. Seven appendixes provide additional clarification, reference materials (such as the glossary of technical terms), and a summary of the regression results.
CHAPTER 2: LITERATURE REVIEW

Overview

The following literature review has been divided into three main sections: *Measures of Jungian Typology*, *Existing Research on the Relationship between MBTI Dimensions and Perceptions of Stress and Coping Strategies*, and *A Critical Review of Methods Used in the Assessment of Ego Defense Mechanisms*. These three sections cover the main theoretical and empirical studies published on the three conceptually related constructs: Jungian typology, coping styles, and defense mechanisms. Particular attention was paid to the studies dealing with the *Myers-Briggs Type Indicator* and the *Defense Style Questionnaire*, as those two psychometric instruments were selected for use in this research project.

The intent of this literature review is to offer a comprehensive picture of the current understanding of the main constructs involved in this study, leading to the identification of an area of research that seems to have been ignored so far. The chapter concludes with the formulation of the main research questions.

Measures of Jungian Typology

In his book entitled “Jung’s Typology in Perspective,” Spoto (1989) provides a clear and concise definition of the phrase *Jungian typology*. He writes:

*Jungian typology* [refers] to a specific method of careful observation of similarities and differences among individual personalities in the everyday world. These similarities and differences are in turn grouped according to certain formal principles elaborated by C. G. Jung, which lead to an understanding of what he terms ‘psychological types’. By helping to identify certain patterns of characteristic
behaviors, Jungian typology can be utilized for purposes of study, therapy, and self-understanding. Jungian typology is a theory (p. xvii).

Since the publication of Jung’s “Psychological Types” in 1921, the conceptual framework put forward by the Swiss psychologist has enjoyed increasing popularity among researchers, clinicians, and the general public. The growing interest in the Jungian typology has amounted to what some critics have called a ‘typological frenzy.’ A major focus in this direction has been the creation of psychometric instruments designed to assess and measure psychological types. It has been remarked that these psychometric attempts depart from Jung's original intention and fall outside the context of his work as a whole. For example, in Spoto’s (1989) opinion, “[Jung] would have been critical of or at best unimpressed by the attempts to substantiate his typological theory through the ‘tests and measurements’ approach” (p. 4). Yet, these reflections have not hindered the continuing interest in and usefulness of instruments designed to assess Jungian psychological types.

Of all the tests designed to measure Jungian psychological types, the Myers-Briggs Type Indicator (Hammer, 1996; Myers & McCaulley, 1985; Myers, McCaulley, Quenk, & Hammer, 1998) stands alone as the instrument of choice due to its conceptual faithfulness to Jung’s theory, solid foundations in research and an extensive data base, multitude of applications, and psychometric robustness. As is apparent from the test manual (Myers, et al., 1998), as well as from the recent supplement to the manual (Hammer, 1996), the MBTI has been used in a wide range of settings: counselling and psychotherapy, career and vocational guidance, management and leadership, team work and communications, education (learning styles and cognitive styles), the area of health, stress and coping, as well as in a number of multicultural applications.
In its latest revision, the MBTI Form M – Self-Scorable (Briggs & Myers, 1998) is a 93-item forced-choice test that generates scores on 4 bipolar dimensions:

*Extraversion vs. Introversion, Sensing vs. Intuiting, Thinking vs. Feeling,* and *Judging vs. Perceiving.* The MBTI manual (Myers, et al., 1998) provides extensive data on the reliability and the validity of the instrument, particularly its latest improved version, Form M. For example, the reported reliability estimates based on the coefficient alpha for the national sample (N = 2,859) are: .91 for the E/I dimension and the T/F dimension, and .92 for the S/N and J/P dimensions. The authors also point out that there are no differences in reliabilities for males or females in the samples.

Among other information on the construction and properties of the MBTI, the manual also provides data on scale intercorrelations as observed on the cumulated normative sample (N = 3,036). Those correlations are presented in Table 1.

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<th>T-F</th>
<th>J-P</th>
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<tr>
<td>E-I</td>
<td>-</td>
<td>-.18</td>
<td>-.12</td>
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<tr>
<td>S-N</td>
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<td>T-F</td>
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<td>J-P</td>
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The correlations show that Sensing types are more likely to be J, and Intuitive types are more likely to be P. The MBTI manual authors point out that this tendency was evident in their research with previous MBTI forms and they argue that “the positive correlations between S-N and J-P probably reflect a fact about the types themselves” (Myers, et al., 1998, p. 152).
Validity data include correlations of MBTI scores with a wide range of other measures, as well as data from exploratory and confirmatory factor analyses. As pointed out in all the MBTI reviews included in the Mental Measurements Yearbook (Coan, 1978; Devito, 1985; Wiggins, 1989), the robust psychometric properties reported in the MBTI manual reflect the test's high reliability and validity standards.

Among the other instruments designed to measure Jungian psychological types the Jungian Type Survey (JTS) and the Singer-Loomis Type Deployment Inventory (SL-TDI) deserve special attention. The JTS (Gray, Wheelwright, & Wheelwright, 1964; Wheelwright, Wheelwright, & Buehler, 1964) appears to be the first instrument developed on the basis of Jung's typological theory and consists of 81 forced-choice items that reveal two attitudes, introversion and extraversion, and four functions, intuition, sensation, thinking, and feeling. The authors admitted that the validity and the reliability of the instrument had not been fully substantiated. In the 1964 brief manual, they pointed out that the best indication of the instrument's validity was the concept of face validity and that reliability by the split-half and test-retest methods was still a work in progress. Since then, only a handful of studies have been performed using the JTS, and their results were inconclusive, particularly with respect to the typing of participants (e.g., Allan & Horvath, 1977; Bradway & Detlof, 1996).

The Singer-Loomis Type Deployment Inventory (SL-TDI), formerly known as the Singer-Loomis Inventory of Personality, or SLIP, was developed by two Jungian analysts, June Singer and Mary Loomis, based on the Jungian type theory and, particularly, on the premise that a relationship exists between an individual's psychological type and that person's behaviour. The SL-TDI (Singer, Loomis, Kirkhart,
& Kirkhart, 1996) consists of 20 situations each followed by 8 suggested behaviours (for a total of 160 items) to which the respondent is invited to assign frequency values ranging from 1 to 5 (i.e., from 'rarely' to 'almost always'). As the authors explain in the Interpretative Guide (Singer & Loomis, 1997), compared to the other inventories based on Jungian typology, the SL-TDI represents a new approach. The eight type modes measured by the SL-TDI are pairs of functions and attitudes (such as introverted thinking or extraverted feeling, etc.) and they are ranked from the most developed mode to the least developed mode. With the improved version of the SL-TDI, the test's reported psychometric properties are very robust. Cronbach alpha coefficients for individual attitudes and functions range between $\alpha = .80$ (for sensation) and $\alpha = .90$ (for extraversion), while the eight mode values range between $0.59$ (introverted feeling) and $0.75$ (extraverted feeling). The SL-TDI manual (Singer & Loomis, 1996) and the interim report (Kirkhart & Kirkhart, 1997) also address satisfactorily the areas of content validity, construct validity, criterion and predictive validity. While the amount of research using the SL-TDI, including the size of the normative sample (N = 558 for version 4, and N = 1233 for version 3), pales in comparison to the existing data bank of the MBTI, the statistical performance of the SL-TDI so far is encouraging.

Measuring the 8 type modes as independent from one another challenges the bipolar assumption of the other typological instruments, such as the MBTI and the JTS (Cowan, 1989; Girelli & Stake, 1993; Loomis & Singer, 1980; Murray, 1996; Spoto, 1989). As Spoto (1989) explains, “in the SLIP, the exclusivity of choice between polar opposites is downplayed in favour of the inclusive (creative, practical) tendencies of the personality to independently utilize and develop all elements of his or her typological
make-up” (p. 138). Comparing the ways in which the MBTI and the SL-TDI measure the Jungian type dimensions, Spoto wonders whether the MBTI reflects “too tidy” a conceptualization of typology, while the SL-TDI’s view may be “too loose.” That author believes that each instrument contributes useful information to the understanding of personality structures and, thus, can be very useful in a therapeutic setting. Spoto (1989) concludes that the MBTI is more concerned with typological classification, while the SL-TDI is more sensitive at tapping the process of individuation (i.e., fluctuations of the SL-TDI scores over time can indicate areas of growth and personal development).

Recently, a number of researchers at the Institute for Personal and Professional Empowerment (a Division of Psychological Type Press) developed the P.E.T. Type Check, an 80-item self-scorable measure of Jungian psychological types. The authors (who are not identified) state that the instrument is based directly on Jung’s theory of psychological type and has been validated through seven years of research and use (P.E.T., 1995). A careful review of the materials provided by this publisher (i.e., the instrument itself and a number of booklets entitled: Description of Types, Interpreting Results, Profile Interpretation – Illustrations, Type Development) reveals good face validity of both the items and the type descriptions, in spite of the complete lack of any psychometric data. The authors also mention that the P.E.T. Type Check has been applied successfully in the areas of personal development (Cranton, 1998), teaching and learning styles, decision-making, as well as leadership and management styles.

Finally, a quick note should be made about another modest instrument designed to measure psychological types based on the Jungian theory, which is the Keirsey Temperament Sorter (Keirsey & Bates, 1984). Although the authors make references to
both Jung’s theory and the MBTI, the “manual” reports no psychometric characteristics for this instrument. The forced-choice questionnaire appears to be a limited selection (70 items) of MBTI-like statements based on face validity. Some anecdotal evidence suggests that the Keirsey Temperament Sorter does not accurately type individuals with close scores on the same bipolar dimension and cannot resolve ties. The only study, known to this author, regarding the reliability and validity of the Keirsey Temperament Sorter is a recent one by Kelly and Jugovic (2001). The authors administered the Keirsey Temperament Sorter II online instrument and the MBTI to 203 first-year college students and found positive correlations between the two measures of psychological type. They conclude that these results give preliminary support to the validity of the online version of the Keirsey.

Of all the measures of Jungian typology discussed above, the MBTI has been chosen for this research project due to its solid psychometric properties (Hammer, 1996; Myers, et al., 1998), its faithfulness to the Jungian type theory, particularly the adherence to the principle of complementarity (Jung, 1971; Sharp, 1987; Spoto, 1989; Thomson, 1998), and its ease of administration and standardized/objective scoring.

In spite of the wide range of MBTI applications and the extensive research involved in the development of the instrument, the literature review performed by this author revealed no study on ego defense mechanisms using the MBTI. However, a number of studies explored the associations between typological dimensions and coping strategies, the latter construct being closely related to the concept of ego defenses. The following section represents a survey of the studies exploring the connection between psychological types, as measured by the MBTI, and coping strategies. The section begins
with a brief theoretical and historical account of the differentiation between coping styles and defenses.

**Existing Research on the Relationship between MBTI Dimensions and Coping Strategies**

As suggested by Cronbach and Meehl (1955), the logic of construct validity involves the identification of a *nomological net* that will relate (a) observable properties or quantities to each other; or (b) theoretical constructs to observables; or (c) different theoretical constructs to one another. With respect to the constructs involved in this research project, the concept of *defense* can be related to that of *coping*.

The history of these constructs reflects the changing views of investigators concerning the definition and assessment of coping strategies and defense mechanisms. In her seminal book entitled *Coping and defending: Processes of self-environment organization*, Haan (1977) distinguished between coping processes and defense processes in a threefold taxonomy that identifies adaptive, neurotic, and psychotic patterns of interpersonal and intrapersonal dynamics. Thus, the three modes of ego processes identified by Haan are: coping, defense, and fragmentation. An example of Haan’s tripartite model is the generic ego process of *sensitivity*, which can manifest itself as *empathy* (coping mode), *projection* (defense mode), or *delusional attribution* (fragmentation mode). For Haan, coping processes describe “the rational, logical, productive, wise, civil, loving, playful, and sensual aspects of people’s ego actions” (p. 36), whereas defenses represent forms of ego actions that negate or distort intersubjective or intrasubjective truth and reality.
The last few decades have seen a proliferation of research in the area of stress and coping. With it, there has been a shift towards focusing on the conscious-versus-unconscious distinction in differentiating between coping processes and defenses. Folkman and Lazarus (1988) view defenses as automatic responses to threat, whereas coping would be the expression of more premeditated process mediated by appraisals. Highlighting the importance of the study of ego defenses, Lazarus (2000) writes: “There is a growing conviction that a large proportion of human appraisals occur without self-awareness of the factors that influence the emotion process. Defense is one of these factors” (p. 671).

As mentioned before, given the noted lack of studies exploring the relationship between typological organization and defense strategies, and given the conceptual links between the constructs of coping and defending, it appears useful to review the existing studies focusing on typological dimensions and coping strategies. The remaining portion of this section is devoted to that review, in particular to studies of stress and coping styles associated with MBTI dimensions.

In spite of its extensive bibliography, the MBTI manual (Myers, et al., 1998) contains few references to studies in the area of stress and coping. Payne (1991) pointed out the scarcity of studies on personality differences in stress and coping using the MBTI. As he believes that the MBTI can be a very sensitive measure of cognitive style, Payne offered a speculative account of perceptions of stress and coping styles typical of two personality profiles: the INFJ and the ISTJ. Payne's descriptions are theory-driven and include references to both the primary appraisal process (in which the individual decides what the situation means for him/her: is it threatening, stressful, benign, or a stimulating
opportunity?) and the secondary appraisal process (in which the individual constructs explanations, assesses resources, and decides how the resources can be deployed to remove the threat). For illustration purposes, here are some excerpts of Payne’s (1991) description of individual type differences with respect to stress and coping:

**ISTJ and the Stress Process**

In the Primary Appraisal phase of the stress process the individual is faced with deciding what the situation means for them: is it threatening, stressful, benign or a stimulating opportunity? Since ST types suppress and distrust feelings it may be that the level of stress/threat has to become quite high before it gets through their sensing/rational filters. [...] Since introverts tend to be intrapunitive and blame themselves the IST combination does create difficulties in quickly determining whether the environment is threatening. [...] The ISTJ person’s strengths would appear to be much more relevant to the requirements of the Secondary Appraisal. The task here is to construct explanations, assess resources and decide how the resources can be deployed to remove threat. The combination of sensing and thinking and the security of a judgemental orientation will be powerful aids for doing this task well. [...] At the Coping Phase their plans and analyses will be thorough and well organized. If things work out as they planned they will cope very well. [...] Introvert STJs are particularly vulnerable to the demands of coping with complex social systems. (p. 197)

Payne points out the conceptual and practical overlap between MBTI dimensions and the two coping strategies identified by Lazarus (1993): “high NF contains emotion-focused coping and high STs would undoubtedly be capable of using problem-focused coping” (Payne, 1991, p. 199). However, the author believes that the MBTI presents an advantage over the Lazarus categories in that: (a) it is based on an elaborate theoretical framework; (b) it offers richer descriptions through the addition of the E/I and J/P dimensions; and (c) it is backed by a large body of research. The author concludes that the MBTI comes closest to the notion of cognitive styles and, as such, is eminently suited in studies of stress and coping.

More recently, Short and Grasha (1995) conducted a study involving 252 first-level research and development managers by correlating the participants’ scores on the
MBTI and the Holistic Stress Test (HST). Based on personality type theory, 25 theory-driven predictions (regarding sources of stress, coping strategies and stress moderators) were made, out of which 13 were confirmed. Examples of such confirmed hypotheses are: *extraverts tend to be better at employing social modes of coping;* or, *higher degrees of introversion are associated with perceptions of social stress.* Overall, the MBTI dimensions appeared to be better predictors of personality moderators of stress and coping strategies than they were of sources of stress on the HST.

There are several reasons why only 13 out of 25 predictions were confirmed in Short and Grasha's (1995) study, and some of those reasons have been identified by the authors themselves. First, there seem to be several discrepancies between the MBTI and the HST: in the authors' opinion, the MBTI tends to measure aspects of cognitive style, while the HST is more focused on reporting perceptions of actual behaviours. In addition, the HST is specific to intrusions, disruptions, and facilitations of a person's life path, whereas the MBTI is concerned with the person's preferred way of interacting, regardless of inhibitory or facilitative factors. In the opinion of this author, Folkman and Lazarus's (1988) *Ways of Coping Questionnaire* would have been more appropriate for correlations with the MBTI, due to its focus on coping strategies.

Another limitation of Short and Grasha's (1995) study is the lack of attention paid to the dynamic analysis of the psychological types of participants. According to type theory, the role played by any function as a dominant is different from the role played by the same function as an auxiliary. This issue was suggested by a reviewer and, according to the authors, was being rectified in a replication study.
Thirdly, there is uncertainty with regard to the correct typing of the participants as long as the numeric scores of the reported types have not been taken into consideration. It is quite likely that the coping strategies employed by a participant with a low score on, say introversion, will differ from those of someone with an extremely high introversion score.

Finally, in their interpretation of the MBTI profiles, Short and Grasha (1995) did not consider the role played by the process of individuation. The concept of individuation is central to Jung's (1921/1977) type theory and, as Payne (1991) observes, "Jung proposed that it was important for people to develop their most natural preference. Attempting to develop all eight of the qualities would lead to poor development in all of them and a 'primitive mentality'" (p. 194). In Payne's reading of the Jungian text, development (i.e., individuation) requires: (a) development of excellence in the favourite dominant process; (b) adequate but not equal development of the auxiliary preferences; (c) eventual admission of the least developed processes to conscious, purposeful use in the service of the dominant processes; and (d) use of each function for the task for which they are best fitted. Naturally, the integration of this kind of analysis in a correlational, nomothetic study like Short and Grasha's is difficult because it involves a more in-depth idiographic methodology.

A number of more recent studies on the associations between the MBTI dimensions and coping styles are reviewed in the supplement to the MBTI manual (Hammer, 1996), which covers the latest decade of research using the instrument. In a study by Hammer (1991), the relationship between type and coping resources was examined in a combined sample drawn from seven groups of respondents that included...
MBA students, residence hall workers, clients in a stress management program, and pain patients. The results indicated that Extraverts had significantly higher total coping resources than did Introverts, and that Feeling types had significantly higher total coping resources than did Thinking types. No differences were found between Sensing and Intuitive types, or between Judging and Perceiving types. The two types with the highest total score on the measure of coping (Coping Resources Inventory) were ENFP and ESTJ.

An important study of type and coping was conducted by Stevens (1994), who administered the MBTI and the Ways of Coping Questionnaire (Folkman & Lazarus, 1988) to a sample of 60 female spouses of first-time heart attack victims. The author found that different types utilized different coping strategies in dealing with the stress of their spouses' illness: Intuitive and Perceiving types tended to use distancing to minimize the significance of the problem; Thinking types used planful problem solving; and Perceiving types tended to be more confrontative and aggressive than Judging types. The author also reported that ENs tended to be more optimistic than INs.

A number of writers have used type dynamics to understand the relationship between type on the one hand and stress and coping on the other hand. Quenk (1993a) suggests that, as a person's coping with illness, fatigue, or stress diminishes, he or she enlists less-preferred functions, in an effort to bolster the defenses of the dominant function, which has been unsuccessful in mastering the precipitating event. Further, as Shelton (1996) explains, because less-preferred functions are generally more inefficient, immature, and one-sided, their use leads to a further decline in performance, thus making coping more and more difficult.
In contradiction to Quenk’s (1993a) suggestion, Hirsh and Kummerow (1989) argue that, when under stress, each type can overuse their dominant preference, while underutilizing less-preferred functions. In this scenario, the balance between the dominant and the auxiliary, so critical for healthy functioning, is lost (Shelton, 1996).

Delunas (1992) offers yet another perspective on the way in which individuals cope under conditions of high stress. Although she writes from the perspective of Keirsey’s temperament theory, her remarks could be applied to type dynamics in general. Delunas argues that, when a person’s basic needs are not being met, he or she will be driven to potentially destructive behaviours. For example, the author suggests that SJs develop physical illness (whereas other types are less prone to do so) because their particular coping strategy requires some sort of bodily response that will absolve them of their responsibilities or to which they can attribute their lack of performance. Delunas (1992) also claims that introverts tend to ignore or deny threatening information and are not likely to interpret inner sensations as signals of potentially serious disease. There is, in addition, a social explanation that the author provides: introverts may be less likely to seek out or profit from social support in their environment. As Shelton (1996) points out, “since social support is a major form of coping, the introvert’s relative isolation may make him or her more vulnerable to the effects of stress” (p. 212).

As a conclusion to this subsection, it can be pointed out that the relatively limited number of studies on the relationship between psychological types and coping strategies highlights the need further research in this area. At the same time, given the demonstrated conceptual links between coping processes and defensive structures, the existing research
findings in this area provide encouragement for the exploration of the possible associations between psychological types and ego defenses.

A Critical Review of Methods Used in the Assessment of Ego Defenses

The Origin of the Theory of Ego Defense Mechanisms

One of Freud’s original contributions to human psychology was his inductive hypothesis that unconscious defense mechanisms protect the individual from conflicting ideas and emotions. According to Vaillant (1986), Freud identified five important properties of defense mechanisms: (a) defenses are major means of managing instinct and affect; (b) they are unconscious; (c) they are discreet from one another; (d) although often the hallmarks of major psychiatric syndromes, defenses are reversible; and (e) defenses can be adaptive as well as pathological. For approximately four decades, from 1894 (Freud, 1894/1962) till 1932, Freud went on to outline most of the defense mechanisms that we speak of today. In his New Introductory Lectures on Psycho-Analysis, Freud (1932/1964a) cited only four defenses as relevant to waking behaviour: repression, sublimation, displacement, and reaction formation. Four years later, he suggested that:

“There are an extraordinarily large number of methods (or mechanisms, as we say) used by our ego in the discharge of its defensive functions... my daughter, the child analyst, is writing a book upon them” (Freud, 1936/1964b, p. 245). He referred, of course, to Anna Freud’s (1936/1964) The Ego and the Mechanisms of Defence, which remains to this day a fundamental resource on the topic.

Anna Freud (1936/1964) described ten defense mechanisms identified earlier by her father (regression, repression, reaction-formation, isolation, undoing, projection,
introjection, turning against the self, reversal, and sublimation) and added two more: identification with the aggressor and altruism. She also recognized both the adaptive and the pathologic character of defenses; as she put it, “all defense mechanisms serve simultaneously internal drive restrictions and external adaptation, which are merely two sides of the same picture” (p. 177).

Anna Freud (1936/1964) acknowledged the controversy surrounding the hierarchical and developmental classification of defenses and pointed out that “the chronology of psychic processes is still one of the most obscure fields in analytical theory” (p. 57). She appeared skeptical about a chronological/developmental classification of defenses, noting: “It would probably be best to abandon the attempt so to classify them and, instead, to study in detail the situations which call forth the defensive reactions” (p. 57).

According to Vaillant (1986) however, she did not solve the problem of specificity and failed to provide mutually exclusive definitions; instead, more than 20 differently labelled defenses can be found in The Ego and the Mechanisms of Defence. As more psychodynamic researchers have become interested in the study of ego defenses, the controversy around their classification and definition has continued to the present day.

Since Anna Freud’s work, one of the most comprehensive analyses of ego defense structures has been the work of Henry Laughlin. In his monumental book, The Ego and Its Defenses, Laughlin (1983) identified 48 discrete defense mechanisms, which he divided into 22 Major Dynamisms and 26 Minor Dynamisms. All defenses are clearly defined and illustrated with rich case examples.
Current State of Research on Ego Defenses:
Conceptual and Measurement Dilemmas

Although the theory of ego defenses has enjoyed wide acceptance among the psychodynamic and psychoanalytic researchers, a number of conceptual issues still remain contentious. According to Plutchik (1995), the major domains of conceptual controversy regarding ego defense mechanisms are: (1) the exact number of defenses; (2) whether these defenses can be categorized in terms of levels of primitiveness; and (3) whether these defenses are adaptive. Vaillant (1986) recognizes that, "by the mid-1970s the empirical understanding of defense mechanisms remained in semantic and conceptual disarray" (p. xiii) and explains why the decision was made not to include defenses in the 3rd edition of the Diagnostic and Statistical Manual (DSM-III).

In the opinion of Safyer and Hauser (1995), the relatively small number of systematic empirical studies examining defense development in the last few decades is in part responsible for the current lack of consensus among researchers, noting that “difficulties include the failure by researchers to arrive at a consensually validated list of defenses and then to develop methodologies to measure them reliably” (p. 122).

Vaillant (1993) has been an ardent advocate for a hierarchical conceptualization of ego defenses (psychotic defenses, immature defenses, neurotic/intermediate defenses, and mature defenses), drawing his arguments from clinical and developmental sources, both empirical and theoretical. Along with other scholars’, his work has contributed to the inclusion in the DSM-IV (APA, 1994) of the Defensive Functioning Scale under Proposed Axes for Further Study. At the theoretical (conceptual/semantic) level, Vaillant
(1986) has insisted on the imperative of providing mutually exclusive definitions for an identifiable set of ego defenses.

An important direction in the conceptualization of ego defense mechanisms is represented by the developmental approach. Very influential in this direction has been Phebe Cramer’s work, which is reviewed in some detail below. Swanson (1988) fully subscribed to the developmental perspective regarding ego defenses and analyzed the concept of personal defenses/development in terms of its social foundations: “personal development is, in one sense, a recapitulation of collective development” (p. 182). Swanson examined ego defenses in light of the developmental theories of Erikson, Piaget, and Kohlberg.

Skodol and Perry (1993) reviewed the empirical evidence bearing on the desirability of including a Defense Mechanism Axis in DSM-IV. The authors noted that a number of reliable measures of defense mechanisms had been developed and that a consensus on definitions was emerging, including evidence supporting a hierarchy of defenses based on their adaptiveness. Skodol and Perry (1993) concluded that “a viable option for DSM-IV is the inclusion of a defense mechanisms axis in an appendix of optional axes for use in special clinical and research settings” (p. 108). Currently, the DSM-IV (APA, 1994) recognizes seven defense levels and provides mutually exclusive definitions of 27 specific defense mechanisms and coping styles (Appendix 3).

It is hoped that future quantitative and qualitative research will bring more empirically sound evidence for this important dimension of ego functioning. There seems to be a strong agreement among current researchers that conducting methodologically rigorous investigations with psychometrically sound instruments is the first step in
addressing some of the issues concerning defense mechanisms and their theoretical
postulates (Davidson & MacGregor, 1996).

Methods of Assessing Defense Mechanisms

The research methods used for measuring defenses can be classified into three
larger groups (Perry & Cooper, 1989): clinically based rating procedures, self-report
instruments, and projective tests. Each of these methods may yield findings with different
implications at the levels of definitions, classification, as well as areas of operation of
defenses.

Clinically Based Rating Procedures

Clinical interview and life vignette ratings.

Several researchers have utilized clinical ratings or judgments of defenses
(Jacobson, et al., 1986; Perry & Cooper, 1989; Semrad, Grinspoon, & Feinberg, 1973;
Vaillant, 1977). The major values of this approach include: the closeness of the data to
the observations made in clinical practice, the richness of the data, and the opportunity to
detect unconscious processes present in the behaviours of the clients/participants

Jacobson, et al. (1986), for example, devised a coding system for evaluating
defenses from in-depth clinical research material. Twelve defenses that were believed to
be pertinent to adolescent developmental processes were assessed, as well as an overall
defensive score. Adolescents were interviewed by trained mental health professionals
(psychiatrists, psychologists, or psychiatric social workers) and the interviews were
audiotaped and transcribed. The rating principles were derived from the theoretical
literature ranging from the works of A. Freud to Vaillant. Unfortunately, the reported
reliability coefficients for inter-rater reliability are confusing and incomplete and the reader cannot evaluate the psychometric soundness of the various defense codes included in the unpublished manual.

Vaillant’s (1977) *Maturity of Defenses Scales* (MODS) are based on clinical observation ratings of defense mechanisms and also the relation of these defenses to psychological and physical health in a longitudinal sample. Ninety-five men were rated for their use of 18 different defense mechanisms. Inter-rater reliability using Vaillant’s (1977) MODS for independent raters on individual defenses ranged from acceptable (.87 for hypochondriasis) to unacceptable (.15 for fantasy) with an overall reliability level of .56. When individual defense mechanisms were classified as mature, intermediate, and immature, the inter-rater reliability was much greater (.84).

The *Defense Mechanism Rating Scales* (DMRS), developed by Perry and Cooper (1989), measure the use of defense mechanisms based on clinical interview or life vignette data. The scales consist of 30 defense mechanisms representing four defensive levels: immature, borderline or image distorting, neurotic, and mature. The manual provides a formal definition of each defense, an explanation of their function, and a discussion of how to discriminate among defenses.

As reported by Perry and Cooper (1989), each participant was engaged in a psychodynamically oriented interview that was videotaped. The taped interviews served as the database from which ratings were made. The reliability of rating the DMRS from the videotaped interviews was assessed in two phases. Six research assistants, half of whom were in graduate school, served as raters. After observing each videotape, the raters independently rated the participants on 22 defenses (mature defenses were not
included in this procedure). Each group then discussed each defense and settled on a consensus rating.

The study showed that the reliability of the individual defenses rated from the videotaped interviews is higher when rated by group consensus than when rated by individual raters alone. Perry and Cooper (1989) noted that “the process of comparing different observations, discussing the evidence, and referring to the manual to answer disputes yields reliability coefficients that are 60% higher on average than those from individual raters alone” (p. 449). It appears, therefore, that group consensus rating may be one way of addressing the main difficulty of clinically based rating scales – the relatively low inter-rater reliability.

Some limitations of Perry and Cooper’s (1989) study include: the study did not compare whether non-professional raters were as reliable as professional raters; the study included mostly individuals who displayed personality disorders, highly symptomatic, and psychosocially impaired; when applied to a single videotaped psychodynamic interview, the DMRS was unable to separate state from trait aspects of defenses. Overall, however, using an interview-based rating method for assessing defense mechanisms, Perry and Cooper’s (1989) study provides support to the idea that defenses have an identifiable relationship to adult personality functioning.

The Q-sort technique.

The modest inter-rater reliability achieved with unstructured interviews, clinical observations, or life vignette ratings prompted Davidson and MacGregor (1996) to develop the Defense-Q, an easy-to-use card-sort instrument designed to assess defense mechanisms under standardized interview conditions. The authors investigated the coder
and defense mechanism reliability of the Defense-Q in a sample of 30 clinical interviews rated by 11 trained coders (undergraduate psychology students). Each interview was approximately 15 minutes long and consisted of standardized questions posed in an interpersonally stressful structured interview format. The questions dealt with occupational and academic interactions, expression of emotions, competitiveness, and interactions with others. All interviews were conducted by a male interviewer who, as reported by Davidson and MacGregor (1996), was extensively trained in structured interview administration. Clinicians watched the videotaped interview and recorded defensive behaviours. After watching each interview and reviewing the notes (recorded defensive behaviours), clinicians used the Q-sort technique to rank the defense mechanisms. This is an adaptation of the typical Q-sort methodology practice (Rogers, 1995), where the participants, not the clinicians, rank-order the cards.

The standardized Q-sort procedure uses 25 cards representing 25 defense mechanisms, which are to be sorted by clinicians into seven piles from least characteristic to most characteristic. The Defense-Q manual also provides information regarding the development and use of the procedure, as well as specific details for each defense mechanism. The reported reliability coefficients for individual defense mechanisms range from .28 for undoing and .92 for humour (average reliability coefficient for all 25 defenses being .73). Coder reliability ranges from .63 to .76 (average .69).

These results suggest that the Defense-Q reliably assesses a comprehensive number of individual defenses and compares favourably with existing measures of defense mechanisms. Among other advantages of the Defense-Q, Davidson and
MacGregor (1996) mention the ease of administration and interpretation and they point out that the instrument can be applied to case or client notes in order to assess changes in defense mechanisms over the course of psychotherapy.

**Self-Report Instruments**

Conceptually, one of the most important questions regarding the assessment of ego defense mechanisms has been: since defense mechanisms are considered primarily unconscious processes, how can a self-report instrument be used to measure them? Proponents of self-report measures of defensive organization have provided a number of answers to this question that basically fall along two lines of thought. First, although it is true that defense mechanisms originate ontogenetically in an unconscious fashion, this does not mean that their use remains unconscious. Plutchik, Kellerman, and Conte (1979) point out that “many individuals, either through therapy or through other life experiences, learn to identify their own typical defense styles” (p. 236). Second, it has been argued that most individuals can report their feelings and can describe their own behaviour as it reflects their self-protective attitude, even though they cannot interpret the psychodynamic meaning of such behaviour (Bond, 1991; Cramer, 1991; Vaillant, 1992; Wallerstein, 1985). As Davidson and MacGregor (1998) explain, “defensive behavior refers to the observable behavior that operates to decrease threat to the person, and need not be unconscious. In theory, then, persons can be aware of their habitual behavior, such as washing their hands (the defensive behavior), and yet still remain unaware of both the cognitive operation that motivates the behavior (the defense mechanism) and the threatening impulse that activates the defense mechanism (e.g., a forbidden sexual impulse)” (p. 966).
Questionnaires.

A number of defense mechanism questionnaires have been suggested in the research literature. Many of these measures have been designed for psychiatric populations. For example, although not a defense mechanism questionnaire per se, the *Ego Profile Scale*, was developed by Semrad, Grinspoon, and Fienberg (1973) as a way for clinicians to correlate the given state of a person’s ego functioning with somatic indices.

Yet, a number of other defense questionnaires are limited in their scope to the measurement of only one, or a few defenses. An example of such a limited scope questionnaire is the work done by Gould, Prentice, and Ainslie (1996) in developing a self-report scale based on the writings of Kernberg (e.g., 1976). The *Splitting Index* (SI) has been recently developed over the course of 6 pilot studies and has been validated through two further studies. Factor analysis revealed a 24-item scale with three 8-item subscales measuring the splitting of self, family, and others’ image. According to the authors, the defense mechanism of splitting had already been successfully identified using the Rorschach test and clinical interviews. However, in previous research, there had been few empirical attempts to develop a self-report questionnaire of splitting. The authors of the SI report strong psychometric properties and recommend the use of the SI as part of a diagnostic battery, as an easily administrable screening device, as well as for monitoring progress in psychotherapy. Gould et al. (1996) also acknowledge the need for further research with psychopathological groups known to engage in splitting before the SI can be confidently used as a measure of the splitting defense mechanism.
Due to its restricted range (i.e., tapping only one defense), the SI has limited clinical applications in counselling. However, given the rigorous test construction standards met by the SI, researchers may benefit from implementing a similar test construction methodology to develop better instruments for assessing defense mechanisms in the clinical as well as non-clinical population.

The *Mental Measurements Yearbooks* mention only two defense mechanism instruments: The Defense Mechanism Index and the Defense Mechanism Inventory. The reviews by Prout (1985) and Rosenthal (1985) on the *Defense Mechanism Index* developed by Arthur B. Sweney and Jerold May (1965-71) (no references provided) are fairly critical of the psychometric properties of the test. It is reported that the 288 items generate 12 defense scales and 12 conflict scales. The reviewers cited above point to the lack of recent research on the scales, the poor quality of the manual, and the absence of detailed information on sample characteristics, as well as incomplete validity and reliability data.

Based on the assumption that people can report their own feelings and describe their own behaviour as it relates to their defense mechanisms, Plutchik, et al. (1979) developed the *Life Style Index* (LSI). In its revised version, the LSI contains 138 items forming 8 individual defense scales: compensation (also including the defenses of identification and fantasy), denial, displacement, intellectualization (also including: sublimation, undoing, and rationalization), projection, reaction formation, regression (also including acting out), and repression (also including isolation and introjection). The authors also linked the eight defense categories to eight basic emotions. They cite a
number of studies using the LSI, in which the measure was able to differentiate between normals and diagnostic groups and between individuals with different dominant traits.

Until recently, the most frequently used and cited paper-and-pencil test of ego defenses has been the *Defense Mechanism Inventory* (DMI) (Gleser & Ihilevich, 1969; Ihilevich & Gleser, 1993a, 1993b). The DMI is a 200 forced-choice item test that generates scores on five defense clusters: *turning against the self*, *projection*, *principalization*, *turning against the object*, and *reversal*. These five clusters encompass a number of specific defense mechanisms uncovered in clinical and research settings. Each mechanism is assessed on four domains in response to 10 stories that represent five commonly experienced types of conflict. As such, the instrument incorporates some projective elements (elicits the subjects’ response to hypothetical scenarios) into an objective format.

The review by Hennessy (1989) is very favourable with respect to the reliability of the instrument, the quality of the manual, and the extensive supporting research. The validity of the measure, however, is questioned. Cramer (1988) provides another review, which is both thorough and favourable of the instrument; she believes that “despite the fixed choice format and the scoring restrictions, the individual scales have proven quite sensitive to rather subtle nuances of clinical behavior, especially in real life or miniature situations” (p. 162). Recent conceptual and factor analytic research, such as the excellent study by Juni (1999), has revealed that the DMI is a composite measure, which goes beyond defenses to index object relations.

In 1986, Ihilevich and Gleser published a short form of the adolescent version of the DMI, which has received a very positive review by Recklitis, Yap, and Noam (1995).
The short form consists of only 6 dilemma stories instead of 10 and enjoys very high correlations with the long form (ranging from .90 to .95). According to Recklitis et al. (1995), internal reliability estimates of the short form scales are also favourable. The introduction of a DMI short form for adolescents has been welcome since “adolescent patients tend to have trouble elaborating on their experiences in ways that clinical interviews require. At the same time, they are often oppositional and inattentive, making it difficult to use lengthy and demanding questionnaires” (p. 367).

Of particular interest for the research with non-psychiatric populations is the study performed by Tauschke, Helmes, and Merskey (1991), in which the researchers found that defense mechanisms are more related to personality than to symptoms. The authors compared the subjects’ responses on the DMI to their responses on the Hysteroid / Obsessoid Questionnaire (Caine & Hope, 1967) and the Hospital Anxiety Depression Scale (Zigmond & Snaith, 1983). The participants constituted a sample of convenience made up of two groups: the first group (N=60) included chronic pain patients, the second group (N=65) consisted of psychiatric patients without a chief complaint of pain. Tauschke, et al. (1991) found that the personality measure and the measure of defense mechanisms correlated with each other quite well, while the measure of defense mechanisms had a very poor correlation with current symptoms. “This emphasizes the fact that findings with the DMI are more likely to be related to personality structure and to early experiences than to current events” (p. 145).

One of the limitations of self-report measures often mentioned in the literature is that they offer respondents a limited number of standardized statements from which they may consciously choose (Safyer & Hauser, 1995). Also, it has been noted that self-report
questionnaires are relatively short and cannot generate the richness of data that could otherwise be obtained through a qualitative method like the semi-structured interview (Smith, 1995). In the opinion of Safyer and Hauser, the main liability of self-report questionnaires is that, by definition, self-report measures rely heavily on the participants' recognition of their own behaviours. As long as defenses are conceptualized as mostly unconscious mechanisms, the data derived from this method may be susceptible to a number of response distortions (such as: biases resulting from the respondents’ defensive denial, social stereotype, and social desirability distortions). However, this limitation could be avoided to the extent to which the self-report instrument: (a) recognizes response bias as a measurable defense mechanism (i.e., denial); (b) incorporates response set items; or (c) is accompanied by a social desirability scale as an adjunct measure.

Many of these observed limitations of self-report instruments have been addressed and corrected with the fairly recent development of the Defense Style Questionnaire (DSQ) by Bond (1986; 1991; Bond et al., 1983). In its current version (Bond, 1991), the DSQ consists of 88 statements designed to tap conscious derivatives of 24 specific defense mechanisms. In addition to the 24 individual defense scales, the DSQ-88 includes 10 items making up a Social Desirability (or Lie) scale. The defenses are organized in four style categories, or factors, along the lines of Vaillant’s hierarchical view and consistent with the DSM-IV nomenclature. By recognizing that the DSQ can identify conscious derivatives of mostly unconscious defenses, the author addresses the issue of measuring unconscious processes through “objective” self-report instruments.

Some evidence for the reliability of the DSQ is indicated in the manual (Bond, 1991). According to Bond, the internal consistency of the questionnaire was determined
by two procedures: first, the item-total correlations on the questions and the defenses that they were supposed to represent were all statistically significant at the $p < .001$ level; second, the defenses clustered in a factor analysis along lines that make theoretical sense. A factor analysis of 209 participants' responses to the DSQ yielded four factors which were labelled defense styles as they reflected different styles of coping with perceived internal or external stress: (1) maladaptive action defenses, (2) image-distorting defenses, (3) self-sacrificing defenses, and (4) adaptive defenses. In reference to the issue of intercorrelations among defense styles (see Table 2), the author points out "the fact that the expected primitive defenses were negatively correlated with the expected higher level defenses provides further evidence for internal consistency" (Bond, 1991, p. 2).

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* $p < .001$
$p < .01$

The DSQ manual appears to provide stronger evidence in favour of the questionnaire's validity. The author indicates a number of studies in which the DSQ scores correlated significantly with earlier clinical assessment (Vaillant, Bond, & Vaillant, 1986), measures of total symptoms (Andrews, Pollock, & Stewart, 1989), psychotherapy outcome ratings (Piper, de Carufel, & Szkrumelak, 1985), measures of early object relations and developmental trauma (Steiger, Vanderfeen, & Leichner, 1988), and Loevinger's Ego Development Test (Brown & Gardner, 1980).
Although the manual (Bond, 1991) does not provide complete psychometric data, evidence in support of the DSQ has recently come from a large number of studies that have used the measure during the past decade. Reliability indices have been reported on given samples in a number of studies of both psychiatric and non-psychiatric populations. Andrews, Pollock, and Stewart (1989), for example, applied a number of statistical analyses (factor analysis, regression analysis, item-to-defense set and item-to-factor correlations) in a study that used a revised form of the DSQ (relabelled in terms of DSM-III-R definitions of defenses) on a large and diverse population sample (N=413, of which: 204 normal controls, 67 persons consulting their family practitioner, and 142 psychiatric outpatients) aged between 18 and 65 years. The authors concluded that the satisfactory psychometric properties of the DSQ should make this measure of defense styles the instrument of choice over the less readily transportable, expensive, and time-consuming interview-based assessments. At the same time, Andrews, et al. acknowledged the need for longitudinal studies in order to identify the degree of stability over time of defense styles seen as aspects of personality.

In response to the concerns regarding the temporal stability of defense styles as measured by the DSQ, Bond (1992; Bond, et al., 1989) reported reasonably high and statistically significant test-retest reliability coefficients in a study of psychiatric outpatients. Of the initial larger sample of 156 participants in that study, for whom complete data were collected, 39 individuals repeated the DSQ 6 months later. The correlations using a $t$ test for the four defense styles at the two times were statistically significant ($p < .001$): for Style 1, $r = .73$; for Style 2, $r = .71$; for Style 3, $r = .68$; and for Style 4, $r = .69$. 
The DSQ has also been cited in a number of studies in order to provide support for the convergent validity of related constructs. As evidence of the construct validity of the NEO Personality Inventory – Revised, Costa and McCrae (1992) report a number of correlates between the five personality domains measured by the test and other “established personality measures,” namely the Myers-Briggs Type Indicator, the Adjective Check List, the Affect Balance Scales, and the Defense Style Questionnaire. In a study based on a sample of 292 participants, the five NEO-PI domains correlated in the predicted directions with the four DSQ factors or styles as well as with certain specific defenses. Among the findings: neuroticism was positively related to regression, displacement and maladaptive action patterns; extraversion was positively related to denial; openness was positively related to adaptive defenses, whereas agreeableness was negatively related to image-distorting defenses and positively related to self-sacrificing defenses. Costa and McCrae (1992) state that “most of these correlations were replicated when personality was measured by Form R NEO-PI ratings from either spouse or peers. These data show that individuals’ characteristic ways of dealing with stress and conflict are consistent with their enduring personality traits as measured by the NEO-PI” (p. 52).

The last decade has seen a steady increase in the number of studies using the DSQ in order to explore the associations between defense styles and a variety of psychological indicators, such as: temperament and character (Mulder, Joyce, Sellman, Sullivan, & Cloninger, 1996); adolescent development – clinical and nonclinical (Steiner & Feldman, 1995; Nasserbakht, Araujo, & Steiner, 1996; Chan, 1997; Tuulio-Hendriksson, Poikolainen, Aalto-Setala, & Lonnqvist, 1997); adaptation in adolescents with depression and eating disorders (Smith, Thienemann, & Steiner, 1992); depression and anxiety in
psychiatric outpatients (Spinhoven & Kooiman, 1997; Akkerman, Lewin, & Carr, 1999); depression in male and female inpatients (Kneepkens & Oakley, 1996); adjustment in interpersonal relationships (Ungerer, Waters, Barnett, & Dolby, 1997); cognitive styles (Westreich, Ritzer, & Duncan, 1997); alexithymia (Wise, Mann, & Epstein, 1991); family environment (Thienemann, Shaw, & Steiner, 1998); behaviour therapy outcome (Muris & Merckelbach, 1996); hostility and psychological risk factors in male patients with personality disorders (Paris, Zweig-Frank, Bond, & Guzder, 1996) personality disorders (Sammallahti, Aalberg, & Pentisaari, 1994; Sammallahti & Aalberg, 1995); gender, age, and cultural differences (Watson & Sinha, 1998); life stress and health status in nonclinical adults (Flannery & Perry, 1990). The vast majority of these studies reported confidence in the psychometric properties of the DSQ and found the questionnaire to be a useful, discriminating tool for both diagnostic and research purposes.

Given the interest in developing reliable and efficient self-report measures of defenses, Andrews, Singh, and Bond (1993) published a 40-item version of the DSQ, along with comprehensive normative and psychometric data for both the 72-item and the new 40-item versions. Their study investigated the responses of 388 controls and 324 patients (anxiety disorders), of whom 89 normal participants also provided retest data at a 4-week interval. The authors concluded that “although very comparable to the 72-item DSQ, the DSQ-40 has yet to be validated against the ratings of skilled clinicians or against other instruments, such as the Defense Mechanism Inventory or the Defense Mechanism Rating Scale, as has been done with the original DSQ” (p. 253). Of particular interest for this research project are a number of psychometric properties of the longer
version of the DSQ as they have been observed on the large sample used by Andrews, et al. (1993). Table 3 shows the reliability coefficients and the test-retest correlations (4 weeks interval for non-clinical respondents) for the 72-item DSQ, adapted from Andrews, et al.

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<th>Cronbach Alpha (N = 712)</th>
<th>Test-Retest Correlation (N = 89)</th>
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<tr>
<td>Immature Factor</td>
<td>.89</td>
<td>.86</td>
</tr>
<tr>
<td>Neurotic Factor</td>
<td>.72</td>
<td>.77</td>
</tr>
<tr>
<td>Mature Factor</td>
<td>.59</td>
<td>.68</td>
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Flannery and Perry (1990) compared the 14-defense and the 20-defense versions of the DSQ in a non-clinical sample of adults. Factor analyses of both versions showed that the most stable cluster was the one representing immature defenses. In correlational analyses, immature defenses were highly associated with higher reported levels of life stress, physical illness, and affective symptoms. The authors concluded that the DSQ was an additional helpful tool in consultation-liaison psychiatry for identifying poor copers at high risk for distress.

Mahalik, Cournoyer, DeFranc, Cherry, and Napolitano (1998) used the DSQ and the DMI to explore the association between men's reporting of gender role conflict and their use of psychological defenses.Canonical correlations indicated that, in the sample of 115 men, the respondents who experienced greater rigidity about being powerful, competitive, or successful, and about expressing emotions also tended to use more immature defenses and some degree of neurotic defenses. The study by Mahalik, et al.
(1998) identified a 3-factor structure of the DSQ and reported factor correlations in the range of .93 to .97 between the original 97-item version of the DSQ (Bond, et al., 1983) and the shorter 40-item version. These results replicated the earlier findings of Andrews, et al. (1993).

Finally, it may be worth noting that the DSQ has already been translated into French (Bonsack, Despland, & Spagnoli, 1998), German (Schauenburg, Schussler, & Leibing, 1991), Chinese (Chan, 1997), Finnish (Sammallahti, et al., 1994), and Japanese (Nishimura, 1998). The studies conducted with the translated versions reported mixed results.

The DSQ has been selected for this research project as the measure of ego defense mechanisms. Further details on scale composition and psychometric characteristics of the DSQ are provided in the section entitled Study 1. The rationale for selecting the DSQ in this study has been included in the Methodology section of this document.

Sentence Completion Tests.

The Defense Mechanism Profile (DMP) was developed by Johnson and Gold (1995) in order to: (a) avoid the interrater reliability problems of the time-consuming interview method of obtaining data; (b) eliminate the response-constricting forced-choice method, in favour of an open-ended format; and (c) provide objective criteria for scoring an open-ended response test.

The DMP consists of 40 sentence stems that state or imply a situation generally considered to be at least mildly psychologically uncomfortable, or express a distressing emotion or feeling. Only two examples of stems are provided in Johnson and Gold (1995):

Sentence Completion Tests.
"When I am really worried, I ________________.

"When I'm around someone who doesn't like me, I ________________.

The test is based on the hypothesis that, given repeated opportunity to respond, the pattern of an individual's typical manner of acting will emerge. In the projective tradition, it is also inferred that a self-reported conscious behaviour can reflect a defense mechanism represented at the unconscious level. Each response is assigned to one of 14 categories grouped hierarchically as follows: (1) Tension Reducers: incorporation-physical, incorporation-indirect, expulsion-physical, expulsion-verbal; (2) Early Defenses: denial, withdrawal; (3) Middle-Range Defenses: undoing, displacement, turning-against-self, reaction formation, compensation; (4) Advanced Defenses: substitution, rationalization/intellectualization.

To maximize the objective aspects of scoring, a scoring manual has been developed, which also addresses training procedures and interrater reliability, test-retest reliability, normative data and demographic trends (mean profile, gender and age, educational status), the influence of social desirability, convergent validity and discriminant validity (discriminating among severe psychological disorders and substance abuse).

Among some limitations of the instrument, as mentioned by the authors, are: the fact that the DMP does not measure all major defenses; the normative sample distribution is skewed in education, age, race, and geographic location; further examination of normative preferences by gender and age groupings is needed; ethnic and racial influences need investigation; 4 of the 14 scales are, thus far, inadequate in test-retest stability for adult population.
**Objective personality tests.**

*The Millon Clinical Multiaxial Inventory - III (MCMI - III)* (Millon, 1994a) is an objective personality test of psychopathology that could be considered, indirectly, a test of defense mechanisms. As Berman and McCann (1995) point out, Millon's theory hypothesizes that there exists an extensive matrix of relationships between defense mechanisms and personality disorders: “Although Millon notes that a given defense mechanism may be utilized by individuals with various personality disorders, he maintains that each pathological character style is linked to one primary defense mechanism” (p. 133).

In order to provide empirical support for this hypothesis, Berman and McCann (1995) conducted a study in which 130 psychiatric patients from both inpatient and outpatient settings were administered the MCMI and the Defense Mechanism Inventory (DMI) by Ihilevich and Gleser (1986). The factor analyses performed on the results from these two objective measures revealed strong corroborating evidence for a number of hypothesized relationships including significant correlations between: antisocial traits and acting out, obsessive-compulsive traits and reaction formation, paranoid traits and projection, passive-aggressive traits and displacement, and self-defeating traits and devaluation.

Recently, Millon (1994b) developed the *Millon Index of Personality Styles* (MIPS), a 180-item true-false questionnaire designed for the non-clinical population, that encompasses a vast array of theory and research. One of the three components of the MIPS identifies four bipolar *cognitive modes* drawing from Jung’s (1971) typological theory. It would be interesting to apply the same factor analytical methodology as the one...
used by Berman and McCann (1995) to compare normal participants' responses on the MIPS and the DMI, in order to find out whether a similar pattern of relationships exists between defense mechanisms and personality types.

Various scales of the *Minnesota Multiphasic Personality Inventory - 2* (MMPI) (Hathaway & McKinley, 1989) have been correlated with defenses or clusters of defense mechanisms. Since the MMPI was not designed as a measure of ego defense mechanisms, researchers have directed their attention to the more general associations that could be established between defensive functioning and various MMPI scales or combinations thereof.

First of all, the traditional validity scales of the MMPI (L, F, and K) as well as the additional validity indices (the TRIN, VRIN, and Back F scales) have been explored as potential indicators of overall defensiveness. Of all these scales, the K scale seems to have demonstrated the highest potential as a measure of defensiveness. However, after reviewing the research in that area, Greene (1991) concluded that the appropriateness of interpreting K as a measure of defensiveness varies according to the type of client: “In a normal population high scores on K do not indicate defensiveness; in maladjusted population, however, high K scores do suggest defensiveness” (p. 114-115).

Secondly, some supplementary scales of the MMPI have been used to detect defensive functioning; they are: the Ego Strength (Es) scale, the Anxiety (A) scale and the Repression (R) scale (Nishimura, 1998). The content areas covered by these scales, however, extend beyond specific defenses and, as in the case of the validity scales, can only be used as relatively general indicators of defensive or anxious organization (Cramer, 1991, Greene, 1991).
Thirdly, a number of researchers have proposed various experimental or special scales inspired from the MMPI items: the Ego Scales (Haan, 1965, 1977), the Repression - Sensitization (R-S) Scale (Ullman, 1958; Byrne, 1961; Bell & Byrne, 1978), the Manifest Anxiety Defensiveness Scale (MAD) (Millimet, 1970), the Admission - Denial Experimental Scales (Little & Fisher, 1958), the Autobiographical Survey (Sarason, 1958), the North Carolina Dissociation Index (Mann, 1995), or the Social Desirability Scale (Edwards, 1953). While all of this research has generated valuable insight into various aspects of defensive functioning, none of these endeavours were aimed at a comprehensive examination of specific defense mechanisms.

Finally, it may be worth mentioning that MMPI scores have been correlated with other measures that were specifically designed to assess ego defense mechanisms. For instance, Gleser and Ihilevich (1969) reported a significant correlation (.32) between introversion, as measured on the MMPI, and turning against the self, as measured on the DMI, among psychiatric outpatients. Also positive correlations have been found between aggression and acting out, or between psychopathology (various diagnoses) and defensiveness (Cramer, 1991).

**Projective Tests**

**The Defense Mechanism Test.**

The Defense Mechanism Test (DMT) was developed by Kragh (1960) as an experimental method for clinical diagnosis and for personnel selection. The test consists of exposing participants to a series of tachistoscopic pictures of a central hero and a peripheral threatening person, the exposure time being increased in steps. There are 6 pictures used in the original test: a *demonstration picture*, to illustrate the instruction of
the test, a *distractor*, shown before and after the test pictures proper in order to separate the perceptual images from one another, and four *stimulus pictures* of threatening situations. According to Kragh (1998), the current standard DMT uses only two pictures and takes just over one hour to complete. The participants make a sketchy drawing of what they have seen, and write a short comment. The participants' reactions to the pictures are then interpreted in terms of “precognitive defensive organization superimposed upon anxiety” (Kragh, 1960, p. 309). The analysis yields scores on seven defenses: repression, isolation, denial, reaction-formation, identification with the aggressor, turning against the self, and identification with a female role. The author reported that the interrater reliability in the samples varied between .51 and .90.

The DMT was used in an experimental study of defense patterns and non-communicative body movements (Ozolins, 1989) and the original range of defenses covered was extended to include: introjection of another object, projection, and regression. Fransson (1997) studied the ability of the DMT to distinguish among the three types of personality organization according to Kernberg’s theory. The results of his study of 75 adolescent psychiatric patients supported the concurrent validity of both Kernberg’s theory of personality organization and the DMT categories. A number of other studies found that the DMT was capable of discriminating significantly among three groups of adolescent participants (psychotic, borderline personality disorder, and a non-patient group) diagnosed according to the DSM IV criteria (Fransson & Sundbom, 1998; Fransson, Sundbom, & Hagglof, 1998). Those authors concluded that the DMT was a promising instrument in the assessment of adolescents in psychiatric care.
Rubino, Sonnino, Graso, and Saya (1991) were the first researchers to study the
discriminative power of the DMT between 99 normal controls and 57 psychiatric
outpatients. Significantly more psychiatric patients than controls were coded for presence
of each of the ten defensive signs of the DMT (with a peak significance for reaction
formation). The coding procedure correctly allocated 85.8% of the control participants
and 85.9% of the psychiatric patients.

However, other researchers have criticized the DMT by claiming that, rather than
capturing defense mechanisms, the test seems to measure participants' misperceptions,
which are a function of the localization of persons on the stimulus picture and of
exposure duration (Zuber & Ekehammar, 1997, Ekehammar & Zuber, 1999). Kragh
(1998) offered a rebuttal, citing methodological shortcomings in the empirical replication
study by Zuber and Ekehammar (1997).

*The Thematic Apperception Test.*

The Thematic Apperception Test (TAT) was developed by Cristina Morgan and
Henry Murray based on Murray's theory of needs (Murray, 1938; 1943). It consists of 30
black-and-white picture/drawing cards plus a completely blank card. Clients are invited
to create a story around each, or some of the cards. The interpretations derived from the
clients' stories are based on the assumption that, when exposed to a sufficiently
ambiguous stimulus, respondents are bound to reveal personal conflicts, experiences,
needs, or strivings. According to Hood and Johnson (1997), "the TAT is widely used and
has many supporters, but has been attacked primarily on psychometric grounds.
Subjective interpretations of TAT results often result in different or opposite conclusions
even by experienced users" (p. 231). For this reason, since the publication of the TAT,
there has been a concerted effort among researchers and clinicians to systematize the interpretation process (Lindzey, 1976).

One year before Cramer’s (1987) study on ego defenses using the *Thematic Apperception Test* (TAT), Vaillant (1986) reported that, in a study he conducted on 100 non-patient graduates, there was no correlation between the participants’ defensive style in everyday life and defenses identified by rating their responses to the TAT. Unfortunately, Vaillant did not provide any reference or methodological details in that study.

Cramer’s (1987) perspective on ego defenses is in agreement with Vaillant’s (1993) principle that defense mechanisms form a hierarchy, from least to most complex. She adopted a developmental approach to the study of defense mechanisms, according to which “the lowest level defenses emerge early in life, while the more complex defenses emerge later in development” (Cramer, 1987, p. 597). The author also developed and validated a method for assessing the use of three defenses - denial, projection, and identification - in TAT stories, in a study of four age groups: preschool, elementary school, early adolescence, and late adolescence. A defense scoring system based on categories was derived from 168 TAT stories, following a similar approach by Stewart (1982). Validation for the initial findings came from a second study performed as part of the same research project. In total 320 subjects and 640 stories were studied. The researcher found that: (a) denial was used more frequently by preschool children, and decreased in use thereafter; (b) identification was used minimally by preschool children but increased steadily through adolescence; (c) projection was most frequent in the two middle age groups.
Further validation of Cramer’s defense mechanism manual for the TAT came from a study by Hibbard, et al. (1994), who used six TAT cards in twenty-nine successive administrations to an acute psychiatric ward and to 40 college undergraduates. Scoring followed Cramer’s defense mechanism manual, but, in addition to the clinical sample, Hibbard and his colleagues also included a control group. Their findings confirmed that psychiatric patients used more primitive types of defense (more denial and projection, less identification) and, within those types, used a higher percentage of lower level (primitive) defenses.

Cramer’s work on the assessment of defenses using the TAT has been recently integrated in a more comprehensive examination of the use of that projective technique (Cramer, 1996). When compared to the scope of this research project, however, one limitation of Cramer’s approach, acknowledged by the author herself, is that her research focused on only three defenses, chosen to represent different points on the developmental continuum.

**Blacky Defense Preference Inventory.**

The Blacky Pictures (Blum, 1950; Blum & Hunt, 1952) consist of 11 cartoons portraying the adventures of a dog named Blacky, his mother, father, and a sibling. For each cartoon, the respondent is asked to rank a series of alternative statements, each an operational definition of a defense mechanism, in terms of how well they represent the way in which Blacky seems to be feeling or acting. The underlying projective principle assumes that the respondent will identify with Blacky and thereby reveal his or her own personal reactions. Through its statements, the instrument covers five defenses: avoidance, reaction formation, projection, regression, and intellectualization. The
definitions of these defenses, following the standard psychoanalytic theory, are provided by Blum (1956).

Massong, Dickson, Ritzler, and Layne (1982) performed a correlational study in which they administered the Blacky Defense Preference Inventory and the DMI (Gleser & Ihilevich, 1969) to 40 undergraduate students (20 female and 20 male). The Pearson correlations between each of the five DMI defense clusters and the Blacky defense scores revealed that only 2 out of 25 comparisons were statistically significant, a result that would be expected by chance. The authors concluded that the DMI and the Blacky do not measure similar defensive processes in spite of the fact that they share common theoretical underpinnings. An alternative explanation for this finding may be the fact that it is inappropriate to compare specific defenses (the Blacky) with clusters of defenses (the DMI).

The Rorschach test.

The Rorschach Ink Blot Test was developed in 1921 by Herman Rorschach and is arguably the most widely used projective test. It consists of 10 ink blot plates, used as standardized stimuli, some of them in black-and-white and several in colour. Different scoring systems have been developed over the years, but, today, the most popular procedure seems to be the Comprehensive System proposed by Exner (Exner & Weiner, 1991; 1993; 1995).

The Rorschach has been used to identify ego defense mechanisms mostly in psychiatric populations (Cooper, S. H., Perry, J. C., & Arnow, D., 1988; Cooper, S. H., Perry, J. C., & O’Connell, M, 1991; Lerner & Lerner, 1988; Ritzler, 1995). The extent to which Rorschach research conceptualizes defenses in the same way as they are
conceptualized in the standard psychoanalytic theory remains an open issue. As Lerner and Lerner (1988) point out, in the Rorschach test, “defenses are seen not primarily as specific modes of coping with structural conflict but as ways in which an endangered self learns to protect itself from a response from a selfobject which constitutes a threat to the self’s cohesion and vitality” (p. 58).

Cooper, et al. (1988) developed the *Rorschach Defense Scales* (RDS), an instrument that primarily utilizes verbal content but includes aspects of formal scoring and the patient-examiner relationship in assessing defense mechanisms. The scales consist of 15 defenses, each of which is defined by 6 to 14 manifestations yielding a total of 132 defined criteria. The rating manual includes a formal definition of each defense, the criteria used for scoring, data on reliability and concurrent validity. The preliminary results reported by Cooper and colleagues offered mixed support to the use of the RDS for diagnosis purposes: “This finding confirms the frequently cited clinical observation that the presence of particular defense mechanisms is rarely diagnostic in itself” (p.200).

In a subsequent longitudinal study, Cooper, et al. (1991) investigated the ability of defenses assessed from the Rorschach test to predict future levels of depression, anxiety, and psychosocial role functioning in a sample of adults with personality and affective disorders. As measured by the RDS, defenses appeared to be less powerful predictors than a descriptively oriented assessment done at the beginning of the study. However, the authors did find some predictive value with certain defenses: devaluation and, to a lesser degree, projection were associated with poor outcome in areas of affective disturbance and social relations, whereas intellectualization, isolation, reaction formation, and Pollyannaish denial were associated with better outcome on these measures.
Other researchers have reported a limited number of statistically significant correlations between certain defense mechanisms and diagnoses of psychopathology. For example, schizophrenics score lower than neurotics, who are lower than normals, on high level, adaptive defenses. Borderline patients score higher than neurotics or schizophrenics on splitting, projective identification, devaluation, and omnipotence (Lerner & Lerner, 1988; Cramer, 1991).

More recently, Ritzler (1995) has reviewed the most important scoring systems that cover comprehensive sets of ego defenses, including Cooper, et al.’s RDS. He concludes that “to date, none of these systems has given us much reason to believe that what passes for defenses on the Rorschach is what Freud, or the ego psychologists, or the object relations theorists, or even Kernberg meant by defenses” (p. 278). The author joins Carr’s (1987) call for further comparisons between Rorschach measures and other clinical and behavioural assessments of defenses. According to Ritzler, until such comparisons are made, the status of the Rorschach as a technique for assessing defense mechanisms must be rated as “uncertain.”

Summary and the Research Questions

The research literature review performed for this study has covered three related concepts in the area of personality and individual differences: Jungian typology, coping styles, and ego defense mechanisms. On the basis of this literature review, a gap has been identified in the existing research. While the links and the conceptual overlap between the areas of psychological types and coping styles, as well as between coping styles and defense mechanisms, have received a certain amount of attention from researchers, to the
knowledge of this researcher, no study thus far has explored the possible associations
between psychological types and ego defenses.

Therefore, the main research question posed in this study is whether there are any
identifiable empirical relationships between Jungian psychological types and ego
defenses. Of further interest is whether those relationships, once identified, follow the
predicted directions, as inferred from psychodynamic theory. This general research
question can be subdivided into several specific research questions:

1. What is the association between psychological type dimensions and defense
   styles/clusters?

2. What is the association between psychological type dimensions and individual
defense mechanisms?

3. What is the role played by Gender, Age, and Education in the relationship
   between psychological types and defensive organization?

In addition to answering the specific research questions mentioned above, this
study had a secondary goal, which was to provide extensive psychometric data on the
Defense Style Questionnaire, as they emerged from this sample, and, based on those
findings, to formulate suggestions for future research on and with the instrument.
CHAPTER 3: METHODOLOGY

Overview

The methodology used in this study was quantitative, correlational, and non-experimental. This study is a theory-driven exploration of the hypothesized relationship between Jungian personality types and ego defenses. However, since this is an exploratory study, elements of data-driven research have been incorporated into the analysis and the interpretation of results. A range of statistical operations (some descriptive and some inferential) have been used in this study in order to address specific research questions. The methods employed include factor analysis, reliability analysis, bivariate correlations, and multiple regression analysis.

The following sections of this chapter deal with the most salient methodological aspects of this study and cover: the procedure for data collection, sample characteristics, psychometric characteristics of instruments, and definitions of the main constructs.

Procedure for Data Collection

Volunteer participants for this study were recruited from among graduate and undergraduate students enrolled in psychology related courses at a Western Canadian university. In an attempt to maximize the diversity within this sample of convenience, the volunteers were encouraged to ask their friends, partners, and relatives to join them in participating in this study. All prospective participants were given a package containing the following documents:
1. *Introductory Letter* (see Appendix I) including information about the nature of the study, the names and contact information for the main researcher, project supervisor, conditions for participation (informed consent, protection of anonymity, time involved, freedom to withdraw from the study, etc.);

2. A copy of the *Myers-Briggs Type Indicator - Form M* (self-scorable);

3. A copy of the *Defense Style Questionnaire* – the 88-item version;

4. *Demographic Information Form* (see Appendix II).

The participants were asked to follow the directions for self-administration of the instruments as indicated by their original authors. In addition, the *Introductory Letter to Participants* included a statement regarding the order in which the participants were to complete the two instruments: half of the total number of participants were asked to complete the MBTI first and the DSQ second, while the other half were instructed to complete the DSQ first and then the MBTI. The counterbalanced administration was meant to control for unknown order effects (e.g., contamination, response set, respondent fatigue, etc.).

Three hundred packages were distributed, of which 213 were completed and returned (a return rate of 71%). All the data were collected over a period of several months, from May to September of 2001.

**Sample Characteristics**

As indicated in the *Introductory Letter to Participants*, this study was open to participants sharing the following characteristics: adult age (18 to 65 years old), non-clinical nature (i.e., absence of known history of psychiatric hospitalization), and
sufficient proficiency in the English language (participants could be speakers of English as a first or second language, with at least a 6th-grade proficiency level in English). In addition to being invited to fill out the two instruments, the participants were asked to answer a few routine demographic questions regarding: age, gender, years of schooling, highest degree completed, whether they were currently enrolled in any academic program, and whether English was their first or second language. Some of the data collected through the Demographic Form (i.e., the question concerning language, and the one on participants' status as students) were intended for the purpose of sample description only.

A total of 213 participants completed and returned the questionnaire packages. All of the packages returned included complete data on the DSQ and the Demographic Information Form. Of the total number of respondents, 206 returned their MBTI dimension scores, while only 198 respondents included their MBTI items data in the returned packages.

Of all the respondents, 119 were female (55.9%) and 94 were male (45.1%). This distribution by gender appears to be relatively close to the values reported by Statistics Canada (1996a) in the latest census of this metropolitan area, which are 50.1% females and 49.9% males.

Of all the participants, 96 (a proportion of 45.1%) were enrolled as students in academic courses at the time of completion of questionnaires. As mentioned earlier, under Procedures for Data Collection, an attempt was made to broaden the nature of the sample beyond university students. The obtained proportion between students and non-students shows that, with respect to this parameter, that goal was achieved.
The age of participants ranged from 18 years to 62 years, with a mean of 35.52 (SD = 11.84) and a median of 32. Figure 1 illustrates the degree to which the data on this variable depart from normal distribution. The moderate positive skewness (.562) indicates that in this sample, there are more individuals in the younger age range than in the older age range (a fact that could be expected, given the data collection procedure in this sample of convenience in a university setting).

Figure 1  
\textit{Sample Distribution by Age (measured in years)}

Of all the participants, a proportion of 69% (147 individuals) reported being speakers of English as a first language. This value is very much in keeping with the data provided by Statistics Canada (1996b, 1996c) in the latest census, according to which the speakers of English as a first language accounted for 64.24% of the population in this metropolitan area and 75.48% of the population in this Western Canadian province.

In an attempt to fine-tune the Education variable, as well as for cross-validation purposes, two sets of demographic data were collected on the participants' level of
education: *highest degree attained* and total number of *years of schooling*. Figures 2 and 3 show that the data on both those variables appear to be normally distributed. The *degree* values in Fig. 2 represent: 1 = Junior High School Education, 2 = High School Diploma, 3 = Some College Education, 4 = Bachelor’s Degree, 5 = Post-Bachelor’s Diploma, 6 = Master’s Degree, and 7 = Doctoral Degree.

**Figure 2**  
*Sample Distribution by Highest Degree Attained*

![Histogram showing distribution of highest degree attained with degree values and statistics: Std. Dev = 1.51, Mean = 3.9, N = 213.00.](image)

**Figure 3**  
*Sample Distribution by Years of Schooling*

![Histogram showing distribution of years of schooling with statistics: Std. Dev = 3.03, Mean = 17.1, N = 213.00.](image)
In selecting the independent variables for this study, particular attention has been given to avoiding the use of redundant variables. Absence of multicollinearity is one of the important assumptions behind multiple regression analysis (Berry, 1993; Berry & Feldman, 1985; Stone & Hollenbeck, 1989; Tabachnick & Fidell, 1989). From the data collected on the Demographic Information Form, the values obtained under Years of Schooling are highly correlated with those under Highest Degree Attained \(r = .85\). As Field (2000) remarked, “high levels of collinearity increase the probability that a good predictor of the outcome will be found non-significant and rejected from the model (a type II error)” (p. 131). Therefore, in order to avoid entering redundant predictors in the multiple regression analysis, a composite index, called Education, was created by averaging participant’s responses on Years of Schooling and Highest Degree Attained. Since the original variables were expressed in different units of measurement, their standardized Z values were used to create the composite index. There are two main advantages of using the composite index. First, the procedure avoids the loss of meaningful information that would have occurred if one or the other of the variables had been discarded. Secondly, the composite index can account for participants who may have gone to school part time and whose score on Highest Degree Attained would be lower relative to their score on Years of Schooling.

The sample distribution by levels of Education is illustrated by the histogram in Figure 4.
Data on the variables of interest were collected through two self-administered, paper-and-pencil, self-report psychological instruments: the *Myers-Briggs Type Indicator* (MBTI) Form M – Self-Scorable (Briggs & Myers, 1998) and the *Defense Style Questionnaire* (DSQ) (Bond, 1991).

The following portion of this section includes a presentation of the descriptive statistics and psychometric properties of the two measures used in this study as they emerged from this sample. Particular attention has been given to the structure and properties of the DSQ, since one of the goals of this project has been to contribute to the advancement of research on and with this relatively new self-report measure.
The Defense Style Questionnaire

The DSQ (Bond, 1991) is an 88-item questionnaire that measures the respondents' conscious derivatives of postulated unconscious defense mechanisms. By circling the appropriate number on a 9-point Likert scale, the respondents express their degree of endorsement of the statements from *strongly disagree* to *strongly agree*. The questionnaire takes about 20 minutes to complete. The measure provides scores on 24 specific defense mechanisms and a social desirability scale.

Before addressing the main research question, a preliminary stage in this research (Study 1) was to assess the internal structure and psychometric properties of the Defense Style Questionnaire (DSQ) as observed on this sample. Unlike the status of the Myers-Briggs Type Indicator, the existing research with and on the DSQ has proposed different models for this ego defense measure: a 4-factor model (Bond, 1991; Bond & Vaillant, 1986; Bond, et al., 1983; 1989; Flannery & Perry, 1990; Sammallahti & Aalberg, 1995; Sammallahti, et al., 1994), a 3-factor model (Andrews, et al., 1989; 1993; Akkerman, Lewin, & Carr, 1999; Mulder, et al., 1996; 1999; Murris & Merckelbach, 1996b; Pollock & Andrews, 1989; Spinhoven & Kooiman, 1997; Spinhoven, et al., 1995; Tuulio, et al., 1997), and even a 2-factor structure (Rutherford, et al., 1998). Given this controversy, it was considered important to assess the psychometric characteristics of this measure as observed on this sample. The results of this factor analytical study also contribute to the replication efforts in the research on and with the DSQ. The description of the factor analytical procedures used to assess the internal structure of the DSQ is included as *Study 1* under the following chapter, *Analyses and Results*. 
Once the factor structure of the DSQ was determined, the pattern of intercorrelations among factors could be assessed. As indicated by Pedhazur (1997) and Cohen and Cohen (1983), measurement errors lead to biased estimates of zero-order and partial correlation coefficients. In other words, when the measures of either or both variables have less than perfect reliabilities, the correlation between the variables is said to be attenuated. This is particularly true for DSQ factors 2 and 3 in this study, which demonstrated relatively low internal consistency (Cronbach alpha .60 and .58, respectively). In order to compensate for the measurement error distortion, disattenuated correlations can be calculated according to the following correction formula:

\[
    r_{12}^* = \frac{r_{12}}{\sqrt{r_{11} \cdot r_{22}}}
\]

where \( r_{12}^* \) = the correlation between variables, corrected for attenuation; \( r_{12} \) = the observed correlation; and \( r_{11} \) and \( r_{22} \) = reliability coefficients of each variable.

Table 4 shows the intercorrelations among the 3 defense styles (final factor structure) as calculated based on this sample. The values given in brackets represent the disattenuated correlations.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Style 1: Maladaptive (Immature) Defenses</td>
<td>–</td>
<td>.287** (.389)</td>
<td>-.192** (-.265)</td>
</tr>
<tr>
<td>Style 2: Neurotic Defenses</td>
<td>–</td>
<td></td>
<td>.140 (.238)</td>
</tr>
<tr>
<td>Style 3: Adaptive (Mature) Defenses</td>
<td></td>
<td></td>
<td>–</td>
</tr>
</tbody>
</table>

** p < .01 (2-tailed).

The small positive correlation between factors 1 and 2, as well as the negative correlation between factors 1 and 3 provide support to the content validity of scale composition.
These results parallel the pattern of intercorrelation obtained by Bond (1991) in his 4-factor solution (see Table 1 above), and replicate the correlations obtained by Spinhoven, et al., (1995) in their 3-factor solution.

The detailed description of the factor analytical procedures used to obtain this factor structure is provided in the section entitled Study 1, included in Chapter 4, Analyses and Results. Information on means, standard deviations, internal consistency coefficients for both individual defenses and defense styles, defense to factor correlations, as well as intercorrelations of defense subscales are included in Appendix IV. The item structure of the DSQ, as it emerged from the factor analysis, is provided in Appendix V.

*The Myers-Briggs Type Indicator*

The MBTI – Form M, Self-Scorable (Briggs & Myers, 1998) is a 93 forced-choice item questionnaire that takes approximately 20 minutes to complete. The four bipolar scales measure 4 dimensions of Jungian psychological type theory: the attitude of introversion vs. extraversion, the functions sensing vs. intuiting and thinking vs. feeling, and the orientation dimension of judging vs. perceiving. Although *Form M* used in this study is self-scorable and, as indicated in the *Introductory Letter to Participants* (see Appendix I), most participants self-scored their questionnaires, the scoring process was repeated by this author using the Excel software in order to ensure accuracy.

The literature review section on the psychometric properties of the MBTI (under Measures of Jungian Typology) was concerned with the data reported in the manual (Myers, et al., 1998). This section includes a number of psychometric characteristics of the MBTI as observed based on this sample. The reliability of the MBTI scales has been
assessed for this sample through the calculation of internal consistency coefficients (Cronbach alpha) and consecutive split-half correlations, all shown in Table 5.

Table 5  *Internal Consistency and Split-Half Coefficients for MBTI Dimensions (N = 198)*

<table>
<thead>
<tr>
<th></th>
<th>E-I</th>
<th>S-N</th>
<th>T-F</th>
<th>J-P</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Coefficient Alpha</strong></td>
<td>.87</td>
<td>.92</td>
<td>.90</td>
<td>.91</td>
</tr>
<tr>
<td><strong>Split-Half</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>X Half</td>
<td>.79</td>
<td>.86</td>
<td>.82</td>
<td>.86</td>
</tr>
<tr>
<td>Y Half</td>
<td>.76</td>
<td>.85</td>
<td>.82</td>
<td>.79</td>
</tr>
</tbody>
</table>

The comparison of the pattern of scale intercorrelations between this sample and the normative sample (Myers, et al., 1998) can provide an indication of sampling adequacy for this study, and can be interpreted as supporting evidence of content validity. The MBTI authors noticed that, in general, larger than expected scale intercorrelations can often be attributed to a greater representation than normal of a particular preference. Myers, et al. found that the largest correlations were always between S-N and J-P and some samples also showed a relationship between T-F and J-P. Table 6 shows the scale intercorrelations (disattenuated values are in brackets) as measured on this sample.

Table 6  *Intercorrelations (Pearson r) of MBTI Dimensions (N = 206)*

<table>
<thead>
<tr>
<th></th>
<th>E-I</th>
<th>S-N</th>
<th>T-F</th>
<th>J-P</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>E-I</strong></td>
<td>-</td>
<td>-.16* (-.18)</td>
<td>-.28** (-.32)</td>
<td>-.15* (-.17)</td>
</tr>
<tr>
<td><strong>S-N</strong></td>
<td>-</td>
<td>.36** (.40)</td>
<td>.49** (.53)</td>
<td></td>
</tr>
<tr>
<td><strong>T-F</strong></td>
<td></td>
<td>-</td>
<td>.33** (.36)</td>
<td></td>
</tr>
<tr>
<td><strong>J-P</strong></td>
<td></td>
<td></td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

Note: * Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).
As can be seen in Table 6, the same pattern of scale intercorrelations has been obtained with this sample as compared to the data reported by Myers, et al. (1998) (see Table 1, above). This similarity can be understood as further evidence of normality of distribution in this sample.

For descriptive purposes, Table 6a below shows the bivariate correlations between MBTI dimensions and demographic variables observed in this sample:

<table>
<thead>
<tr>
<th></th>
<th>E-I</th>
<th>S-N</th>
<th>T-F</th>
<th>J-P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>-.042</td>
<td>-.107</td>
<td>-.113</td>
<td>-.079</td>
</tr>
<tr>
<td>Gender</td>
<td>.139*</td>
<td>-.043</td>
<td>-.300**</td>
<td>.077</td>
</tr>
<tr>
<td>Education</td>
<td>-.039</td>
<td>-.260**</td>
<td>-.005</td>
<td>-.011</td>
</tr>
</tbody>
</table>

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

** Rationale for Instrument Selection

Apart from the sound psychometric characteristics of the two instruments reported in the literature and in this study, there are a number of conceptual or theoretical reasons behind their selection for this research project. In their own way, each of the tests selected were designed based on the recognition of unconscious determiners of behaviour or automatic responses to internal or external stimuli. In the DSQ manual, Bond (1991) explains that, in selecting the 88 items that make up the questionnaire, the purpose has been to provide statements that represent behavioural correlates to unconscious defensive strategies. The reactions described by the test items are automatic responses to perceived threat or danger and the respondents are asked to self-evaluate the frequency of that
response on the scale from 1 to 9. By the same token, the MBTI addresses the issue of conscious versus unconscious determiners of behaviour through the dynamic organization of functions. The scored MBTI profile reflects the individual’s conscious functions (i.e., the dominant and the auxiliary), attitudes and orientations, while the unconscious functions (called tertiary and the inferior function) are postulated by type theory to be the opposite poles of the reported conscious functions. In other words, the inferior function is the theoretical opposite of the dominant function, while the tertiary function is the theoretical opposite of the auxiliary function. Jung’s (1971) typological theory is strongly based on the concept of complementarity between conscious and unconscious forces governing behaviour and, in keeping with that view, the MBTI is based on this bipolar structure of psychological functions (Murray, 1996; Myers, et al., 1998).

To summarize, the MBTI and the DSQ present a number of attributes that make them particularly appropriate for this research project: (a) good psychometric properties; (b) convenient length and ease of administration; (c) standardized/objective scoring procedures; (d) applicability to non-clinical population samples and relevance for counselling; and (e) conceptual agreement with established theories or standards (i.e., Jung’s typological theory in the case of the MBTI, and DSM-IV definitions in the case of the DSQ).

**Current Definitions**

Part of the objective of this research was to lay the groundwork for the development of more comprehensive definitions of both ego defenses and psychological
types in light of the observed associations between them. At this point, however, some preliminary comments about definitions can be made, reflecting the way in which the constructs are operationalized by the instruments used in this research.

*Psychological Types*

In the last chapter of *Psychological Types* entitled *Definitions*, Jung (1921/1971) puts forth for the first time in an organized fashion the various concepts he had come to use in the course of his work. According to Hopke (1989), while these definitions are extremely helpful and accessible, they seem to represent Jung's early thought, as the concepts addressed here underwent further refinement over Jung's long career. In any event, for the purposes of this document, a comparison between the definitions provided by Jung and those included in the MBTI manual will show that the MBTI is conceptually faithful to Jung's understanding of the two attitudes and the four functions, as well as the two orientation modalities (*judging* and *perceiving*) formally added by Isabel Briggs and Catherine Myers but solidly based on the Jungian text. Following is just one example of that comparative analysis. Here is Jung's (1921/1971) definition of extraversion:

Extraversion is an outward-turning of *libido*. I use this concept to denote a manifest relation of subject to object, a positive movement of subjective interest towards the object. Everyone in the extraverted state thinks, feels, and acts in relation to the object, and moreover in a direct and clearly observable fashion, so that no doubt can remain about his positive dependence on the object. In a sense, therefore, extraversion is a transfer of interest from subject to object. If it is an extraversion of thinking, the subject thinks himself into the object; if an extraversion of feeling, he feels himself into it. In extraversion there is a strong, if not exclusive, determination by the object. Extraversion is *active* when it is intentional, and *passive* when the object compels it, i.e., when the object attracts the subject's interest of its own accord, even against his will. When extraversion is habitual we speak of the extraverted *type* (p. 427).

The MBTI definition of the extraverted attitude is in keeping with Jung's conceptualization:
In the Extraverted attitude, energy and attention flow out, or are drawn out, to the objects and people in the environment. The individual experiences a desire to act on the environment, to affirm its importance, to increase its effect. Persons habitually taking the Extraverted attitude may develop some or all of the characteristics associated with extraversion: awareness and reliance on the environment for stimulation and guidance; an action-oriented, sometimes impulsive way of meeting life; openness to new experiences; ease of communication and sociability; and a desire to “talk things out” (Myers, et al., 1998, p. 26).

In addition, an examination of the face validity of the MBTI items tapping the E/I dimension reveals the items to be representative of the definition quoted above. Here are some examples of the MBTI forced-choice items tapping the E/I dimension:

1. Are you usually (a) a “good mixer”, or (b) rather quiet and reserved?
2. Do you tend to have (a) deep friendships with a very few people, or (b) broad friendships with many different people?
3. (a) lively (46) (a) speak (52) (a) sociable (b) calm (b) write (b) detached

**Ego Defenses**

The current understanding of ego defenses in general is still in keeping with Freud’s early formulation of the concept as representing the ego’s capacity to hide or alleviate anxiety provoking stressors. “The ego makes use of various procedures for fulfilling its task, which, to put it in general terms, is to avoid danger, anxiety and unpleasure. We call these procedures *mechanisms of defense*” (Freud, 1937).

The DSQ manual (Bond, 1991) does not include formal definitions of the defenses covered by this instrument. However, a careful study of the author’s views on ego defenses presented in his published articles and chapters of edited books, reveals that Bond’s conceptualization of ego defenses is very much in keeping with the views expressed by one of the most influential current researchers in this area, George Vaillant,
as well as the guidelines presented in the DSM-IV. The most important areas of agreement are those concerning: (a) the mostly unconscious or automatic character of defense mechanisms; (b) the acknowledgement of the adaptational value of defensive responses to perceived threat; (c) the hierarchical organization of defenses. There is less agreement, however, with respect to the possible link between defenses and more enduring personality characteristics.

A comparative look at the list of defenses included in the Defensive Functioning Scale – Proposed Axis for Further Study by the DSM-IV (American Psychiatric Association, 1994) and the defenses measured by the DSQ (Bond, 1991) reveals a substantial overlap (see Appendixes III and V herewith). Of the 24 defense mechanisms measured by the DSQ, 18 also appear on the DSM-IV scale. In addition to those 18 common defenses, the DSM-IV lists 8 others. An examination of the face validity of the DSQ items supports the idea that Bond’s implied definitions of defenses are in keeping with those included in the DSM-IV. For example, Denial is tapped by four DSQ items:

(16) *People say I’m like an ostrich with my head buried in the sand. In other words, I tend to ignore unpleasant facts as if they didn’t exist.*

(42) *I fear nothing.*

(52) *My philosophy is “Bear no evil, do no evil, see no evil.”*

(57) *I would be very nervous if an airplane in which I was flying lost an engine.*

The DSM-IV definition of denial reads: “The individual deals with emotional conflict or internal or external stressors by refusing to acknowledge some painful aspects of external reality or subjective experience that would be apparent to others” (American Psychiatric Association, 1994, p. 755).
Appendix VI, *Glossary of Terms, Definitions, and Brief Descriptions*, includes a complete list of definitions for all the constructs used as variables in his study: individual defenses, typological attitudes, functions, and orientations, as well as whole psychological types.
CHAPTER 4: ANALYSES AND RESULTS

Overview

This chapter includes a detailed description of the different analytical procedures used to address the specific research questions posed in this study. All of the statistical operations in this study have been performed using the software program Statistical Package for Social Sciences (SPSS), version 9. Prior to all analyses, the data have been inspected for outliers, normal distribution, means, ranges, standard deviations, zero-order correlations, and other descriptive and frequency statistics (Rosnow & Rosenthal, 1996). Some of those results have been reported under the previous sections entitled Sample and Instruments. Data entry problems and missing data were identified and corrected prior to all analyses. Extremely few missing data were found and a decision was made in favour of pairwise exclusion of cases, a procedure that maximizes the use of the sample size (Field, 2000; Stevens, 1996).

The issue of level of statistical significance has been discussed extensively in the quantitative research literature (Cohen, 1990; Shaver, 1993). In an informative article on the origins of the .05 level of statistical significance, Cowles and Davis (1982, p. 558) conclude:

The fundamental questions that remain are straightforward and simple: Do people, scientists and nonscientists, generally feel that an event which occurs 5% of the time or less is a rare event? Are they prepared to ascribe a cause other than mere chance to such infrequent events?

If the answer to these questions is “Yes”, or even “Generally speaking, yes”, then the adoption of the level as a criterion for judging outcomes is justifiable.

There is no doubt that the “threshold of dismissal of the idea of chance” depends on a complex set of factors specific to each individual, and therefore
varies among individuals. As a formal statement, however, the level has a longer history than is generally appreciated.

The conventional p = .05 level of statistical significance has been adopted in this study.

Prior to addressing the main research questions concerning the possible associations between psychological types and ego defense mechanisms, a preliminary factor analytical study (Study 1) was conducted on the DSQ. As was pointed out earlier, the investigation of the research literature on and with the DSQ revealed a number of factorial solutions proposed by different researchers. The objective of Study 1 was to determine the factorial structure of the DSQ as observed on this sample, in order to identify the variables to be entered in the subsequent correlational analyses. At the same time, Study 1 contributes to the validation efforts undertaken with the DSQ, as it provides replication evidence of the psychometric characteristics of the instrument.

Study 2 addressed the possible associations between psychological types and ego defense organization, and was organized in terms of the two specific research questions: (1) What is the association between defense styles and psychological types? and (2) What is the association between individual defense mechanisms and psychological types? Within each of the specific research questions mentioned above, the investigation started by determining the relationship between the criterion variable (defense style or defense mechanism) and the demographic variables: Age, Gender, and Education. This was considered important for establishing a baseline for evaluating the superior predictive power of the models that included psychological type variables. The analysis then continued with an examination of the combined effects of both demographic variables and psychological type variables. The multiple regression analysis also included the
detection of possible interaction effects. Finally, the role played by the categorical variable Gender was further investigated.

**Study 1: Factor Analysis of the DSQ**

*Introduction and Research Question*

The exploratory factor analysis procedure used on the DSQ consisted of two processes: one was a factor analysis performed on the DSQ items and the other was a factor analysis performed on the subscales of individual defenses. The purpose of using this twofold process was to obtain a convergent solution to the factor structure of the DSQ. The factor analysis of the DSQ items was performed on 79 defense-related items, i.e., after setting aside the 10 items that compose the Social Desirability (or Lie) scale. The factor analysis of individual defenses was performed on the scores of the 24 defense subscales. The section entitled *Principal Components Analysis* includes a detailed account of that analytical procedure and its results.

In addition to factor analysing the defense-related items and subscales of the DSQ, this study made an original contribution by including a principal components analysis of the 10 Social Desirability items that are part of the instrument. To this researcher's knowledge, no prior study, including the DSQ manual (Bond, 1991), has examined the internal structure of this scale. This analysis was deemed important and necessary in light of the conceptual relationship between defensive organization and socially desirable responding. The results of that analysis are presented in the subsection entitled *The Social Desirability Scale*. 
In the statistical literature on factor analysis, a number of researchers point out that there is a technical difference between factor analysis and principal components analysis (Dunteman, 1989). Mostly, the difference consists in the mathematical way in which communality estimates are calculated. In their reviews of this matter, Field (2000) and Stevens (1996) conclude that, with more than 20 variables and communalities greater than 0.7 for all variables, different solutions are unlikely. For this reason, following Field's example, the terms components and factors have been used interchangeably throughout this document.

**Principal Components Analysis**

As in any exploratory factor analysis, different rotation methods and different factor solutions were tried and their output compared. In terms of deciding on the final rotation methods for the factor analyses (presented below), the following four criteria were used: (a) maximization of the percentage of variance explained by the rotated solution; (b) conceptual match between the factor solution for items analysis and the factor solution for the defense analysis; (c) conceptual match between the technical characteristics of a given rotation method and the goal of that analysis; and (d) an attempt to replicate the methods used in previous research, particularly the DSQ manual (Bond, 1991).

The best factorial solution for the 79 defense-related items was provided by a principal component analysis using quartimax rotation with Kaiser normalization. The orthogonal quartimax rotation was preferred over other methods because it tends to "clean up the variables" (Stevens, 1996, p. 368). The quartimax rotation simplifies the factor pattern of a variable by forcing it to correlate highly on one main factor and either
not at all or at a very low level on other factors (Rennie, 1997). After comparing the results of several factor analyses, the best model appeared to be a 3-factor solution (rotation converged in 5 iterations), which explained 24.1% of the total variance. The 3 factors identified are: the *Maladaptive Defense* factor, the *Neurotic Defense* factor, and the *Adaptive Defense* factor. The principal component loadings produced by that analysis are presented in Table 7. Loadings smaller than .10 have been omitted. Values in bold characters indicate the items retained as the best representatives of their respective factors (for a detailed account of the criteria used in selecting the most representative items, see the next subsection entitled *Selecting Items Representative of Factors*).

### Table 7  DSQ Items and Principal Component Loadings (*N* = 213)

<table>
<thead>
<tr>
<th>Item</th>
<th>Component</th>
<th>FUL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>66.</td>
<td>I'm sure I get a raw deal from life.</td>
<td>.691</td>
</tr>
<tr>
<td>82.</td>
<td>If I have an aggressive thought ...</td>
<td>.656</td>
</tr>
<tr>
<td>64.</td>
<td>There's no such thing as &quot;finding a ...&quot;</td>
<td>.629</td>
</tr>
<tr>
<td>4.</td>
<td>I'm always treated unfairly.</td>
<td>.622</td>
</tr>
<tr>
<td>12.</td>
<td>People tend to mistreat me.</td>
<td>.601</td>
</tr>
<tr>
<td>87.</td>
<td>I cannot be blamed for what I do wrong.</td>
<td>.584</td>
</tr>
<tr>
<td>72.</td>
<td>Most of what happens to me is not ...</td>
<td>.575</td>
</tr>
<tr>
<td>30.</td>
<td>I'm a real put-down artist.</td>
<td>.573</td>
</tr>
<tr>
<td>11.</td>
<td>I am superior to most people I know.</td>
<td>.551</td>
</tr>
<tr>
<td>18.</td>
<td>I often feel superior to people I'm with.</td>
<td>.543</td>
</tr>
<tr>
<td>55.</td>
<td>Everyone is against me.</td>
<td>.537</td>
</tr>
<tr>
<td>19.</td>
<td>Someone is robbing me emotionally ...</td>
<td>.533</td>
</tr>
<tr>
<td>69.</td>
<td>Doctors never really understand ...</td>
<td>.531</td>
</tr>
<tr>
<td>54.</td>
<td>If my boss bugged me ...</td>
<td>.506</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>53. As far as I'm concerned, people ...</td>
<td>.504</td>
<td>-.161</td>
</tr>
<tr>
<td>77. I believe that people usually see more ...</td>
<td>.503</td>
<td>-.148</td>
</tr>
<tr>
<td>7. I keep getting into the same type ...</td>
<td>.501</td>
<td>.273</td>
</tr>
<tr>
<td>2. People often call me a sulker.</td>
<td>.494</td>
<td>.307</td>
</tr>
<tr>
<td>29. I am a very inhibited person.</td>
<td>.487</td>
<td>.241</td>
</tr>
<tr>
<td>16. People say I'm like an ostrich ...</td>
<td>.466</td>
<td>.169</td>
</tr>
<tr>
<td>25. People tell me I have a persecution ...</td>
<td>.463</td>
<td>.241</td>
</tr>
<tr>
<td>24. I pride myself on my ability ...</td>
<td>.458</td>
<td>.181</td>
</tr>
<tr>
<td>76. I'm often told that I don't show ...</td>
<td>.451</td>
<td>-.115</td>
</tr>
<tr>
<td>83. Often I find that I don't feel ...</td>
<td>.451</td>
<td>.253</td>
</tr>
<tr>
<td>75. My doctors are not able ...</td>
<td>.449</td>
<td>.217</td>
</tr>
<tr>
<td>78. I have habits or rituals ...</td>
<td>.430</td>
<td>-.114</td>
</tr>
<tr>
<td>62. I get a headache when ...</td>
<td>.413</td>
<td>.266</td>
</tr>
<tr>
<td>70. When someone close to me dies ...</td>
<td>.409</td>
<td></td>
</tr>
<tr>
<td>88. If I have an aggressive thought ...</td>
<td>.407</td>
<td>.283</td>
</tr>
<tr>
<td>46. I get openly aggressive ...</td>
<td>.380</td>
<td>.113</td>
</tr>
<tr>
<td>13. If someone mugged me ...</td>
<td>-.374</td>
<td>.287</td>
</tr>
<tr>
<td>41. I am very shy about approaching ...</td>
<td>.365</td>
<td>.224</td>
</tr>
<tr>
<td>60. Some people are plotting to kill me.</td>
<td>.353</td>
<td></td>
</tr>
<tr>
<td>36. I tend to be on my guard ...</td>
<td>.340</td>
<td>.258</td>
</tr>
<tr>
<td>52. My philosophy is “Hear no evil ...</td>
<td>.332</td>
<td></td>
</tr>
<tr>
<td>45. I get very sarcastic when I'm angry.</td>
<td>.325</td>
<td>.187</td>
</tr>
<tr>
<td>65. We should never get angry ...</td>
<td>.181</td>
<td></td>
</tr>
<tr>
<td>68. When I know I will have to face ...</td>
<td>-.161</td>
<td></td>
</tr>
<tr>
<td>71. After I fight for my rights ...</td>
<td>.170</td>
<td>.541</td>
</tr>
<tr>
<td>28. I get physically ill when ...</td>
<td>.227</td>
<td>.514</td>
</tr>
<tr>
<td>32. I withdraw from people when ...</td>
<td>.114</td>
<td>.474</td>
</tr>
<tr>
<td>40. I work more things out in my day ...</td>
<td>.225</td>
<td>.455</td>
</tr>
<tr>
<td>27. I often act impulsively ...</td>
<td>.304</td>
<td>.438</td>
</tr>
<tr>
<td>35. I withdraw when I'm angry.</td>
<td>.127</td>
<td>.431</td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>-----------------------------------------------------------------------------</td>
<td>---</td>
</tr>
<tr>
<td>1.</td>
<td>I get satisfaction from helping ...</td>
<td>.403</td>
</tr>
<tr>
<td>22.</td>
<td>I'd rather starve than ...</td>
<td>.391</td>
</tr>
<tr>
<td>9.</td>
<td>I act like a child when ...</td>
<td>.383</td>
</tr>
<tr>
<td>73.</td>
<td>When I'm depressed or anxious ...</td>
<td>.387</td>
</tr>
<tr>
<td>10.</td>
<td>I'm very shy about standing up ...</td>
<td>.235</td>
</tr>
<tr>
<td>34.</td>
<td>My friends see me as a clown.</td>
<td>.167</td>
</tr>
<tr>
<td>56.</td>
<td>I try to be nice to people ...</td>
<td>-.163</td>
</tr>
<tr>
<td>21.</td>
<td>I often am driven to act ...</td>
<td>.245</td>
</tr>
<tr>
<td>63.</td>
<td>I often find myself being ...</td>
<td>.366</td>
</tr>
<tr>
<td>81.</td>
<td>If I can predict that I'm going ...</td>
<td>.173</td>
</tr>
<tr>
<td>33.</td>
<td>I often push myself so far ...</td>
<td>.232</td>
</tr>
<tr>
<td>43.</td>
<td>Sometimes I think I'm an angel ...</td>
<td>.283</td>
</tr>
<tr>
<td>49.</td>
<td>I withdraw when I'm sad.</td>
<td>.316</td>
</tr>
<tr>
<td>79.</td>
<td>I take drugs, medicine ...</td>
<td>.114</td>
</tr>
<tr>
<td>80.</td>
<td>When I feel bad, I try to</td>
<td>.293</td>
</tr>
<tr>
<td>47.</td>
<td>I believe in turning the other cheek ...</td>
<td>.292</td>
</tr>
<tr>
<td>51.</td>
<td>I always feel that someone ...</td>
<td>.232</td>
</tr>
<tr>
<td>58.</td>
<td>There is someone I know who ...</td>
<td>.256</td>
</tr>
<tr>
<td>39.</td>
<td>I'm often late for appointments.</td>
<td>.255</td>
</tr>
<tr>
<td>17.</td>
<td>I stop myself from going all out ...</td>
<td>.178</td>
</tr>
<tr>
<td>85.</td>
<td>I smoke when I’m nervous.</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>I’m able to keep a problem out of ...</td>
<td>-.144</td>
</tr>
<tr>
<td>42.</td>
<td>I fear nothing.</td>
<td>.217</td>
</tr>
<tr>
<td>61.</td>
<td>I’m usually able to see the funny ...</td>
<td>-.221</td>
</tr>
<tr>
<td>67.</td>
<td>I fall apart under stress.</td>
<td>.392</td>
</tr>
<tr>
<td>37.</td>
<td>I’ve got special talents that ...</td>
<td>.253</td>
</tr>
<tr>
<td>8.</td>
<td>I’m able to laugh at myself ...</td>
<td>-.226</td>
</tr>
<tr>
<td>23.</td>
<td>I ignore danger as if ...</td>
<td>.380</td>
</tr>
<tr>
<td>5.</td>
<td>I work out my anxiety through ...</td>
<td>-.126</td>
</tr>
<tr>
<td>50.</td>
<td>I’m shy about sex.</td>
<td>.238</td>
</tr>
</tbody>
</table>
Several measures of sampling adequacy indicated that the correlation matrix for the 78 DSQ items was highly suitable for factor analysis (Field, 2000). The obtained value of the Kaiser-Meyer-Olkin index of sampling adequacy (KMO = 0.737) is considered by Hutcheson and Sofroniou (1999) to be a good value, indicating no significant diffusion in the pattern of correlations. Also the diagonal elements (KMO values for individual variables) of the anti-image correlation matrix were above .05 for all items (Field, 2000). Bartlett’s test of sphericity, which indicates the presence of relationships among variables, yielded a highly significant value $\chi^2 = 6592.46$, $p < 0.001$. Finally, the scree plot (Cattell, 1966), shown in Figure 5, provided relatively equal justification for a 3 or a 4-factor solution.

The best factorial solution for the 24 individual defenses was revealed by a principal components analysis using the varimax rotation method. As Rennie (1997) explains, the varimax method focuses on cleaning up the factors, thus making the interpretation of factors easier. This rotation method was also used by Bond (1991). The analysis produced 3 factors, which explain 38.97% of the total variance. Table 8 shows

<table>
<thead>
<tr>
<th></th>
<th>1 Maladaptive Defenses</th>
<th>2 Neurotic Defenses</th>
<th>3 Adaptive Defenses</th>
</tr>
</thead>
<tbody>
<tr>
<td>59</td>
<td>I can keep the lid on my feelings ...</td>
<td>.289</td>
<td>.273</td>
</tr>
<tr>
<td>74</td>
<td>Hard work makes me feel better.</td>
<td>-.101</td>
<td>.258</td>
</tr>
<tr>
<td>84</td>
<td>Sticking to the task at hand keeps me ...</td>
<td>.162</td>
<td>.124</td>
</tr>
<tr>
<td>86</td>
<td>If I were in a crisis ...</td>
<td>.122</td>
<td>-.222</td>
</tr>
</tbody>
</table>

Eigenvalue

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>11.55</td>
<td>4.04</td>
<td>3.20</td>
</tr>
</tbody>
</table>

% Variance Explained

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Common</td>
<td>13.28</td>
<td>6.64</td>
</tr>
<tr>
<td>Cumulative</td>
<td>13.28</td>
<td>19.92</td>
</tr>
</tbody>
</table>

the factor loadings for this analysis. Bold characters reflect the overlap between the conceptual classification of defenses under factors (styles) and the highest scale loadings.

**Table 8**  
*Principal Component Loadings of DSQ Defenses (N = 213)*

<table>
<thead>
<tr>
<th>Defense</th>
<th>Component</th>
<th>FUL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Projection</td>
<td>.796</td>
<td>.112</td>
</tr>
<tr>
<td>Omnipotence-Devaluation</td>
<td>.708</td>
<td>-.155</td>
</tr>
<tr>
<td>Isolation of Affect</td>
<td>.673</td>
<td>-.313</td>
</tr>
<tr>
<td>Splitting</td>
<td>.665</td>
<td>-.108</td>
</tr>
<tr>
<td>Hypochondriasis</td>
<td>.660</td>
<td>.132</td>
</tr>
<tr>
<td>Acting-Out</td>
<td>.619</td>
<td>.320</td>
</tr>
<tr>
<td>Passive Aggression</td>
<td>.609</td>
<td>.278</td>
</tr>
<tr>
<td>Denial</td>
<td>.571</td>
<td>-.146</td>
</tr>
<tr>
<td>Undoing</td>
<td>.540</td>
<td>.411</td>
</tr>
<tr>
<td>Defense</td>
<td>FUL</td>
<td>2000</td>
</tr>
<tr>
<td>-----------------------</td>
<td>---------</td>
<td>----------</td>
</tr>
<tr>
<td>Inhibition</td>
<td>.535</td>
<td>.296</td>
</tr>
<tr>
<td>Regression</td>
<td>.533</td>
<td>.453</td>
</tr>
<tr>
<td>Somatization</td>
<td>.465</td>
<td>.437</td>
</tr>
<tr>
<td>Fantasy</td>
<td>.372</td>
<td>.350</td>
</tr>
<tr>
<td>Idealization</td>
<td>.274</td>
<td>.246</td>
</tr>
<tr>
<td>Pseudo-Altruism</td>
<td>.542</td>
<td></td>
</tr>
<tr>
<td>Consumption</td>
<td>.516</td>
<td></td>
</tr>
<tr>
<td>Affiliation</td>
<td>.504</td>
<td></td>
</tr>
<tr>
<td>Withdrawal</td>
<td>.275</td>
<td>.355</td>
</tr>
<tr>
<td>Reaction Formation</td>
<td>.352</td>
<td>.249</td>
</tr>
<tr>
<td>Anticipation</td>
<td>.345</td>
<td>.325</td>
</tr>
<tr>
<td>Suppression</td>
<td>-.190</td>
<td>.703</td>
</tr>
<tr>
<td>Humour</td>
<td>.222</td>
<td>.548</td>
</tr>
<tr>
<td>Task Orientation</td>
<td>.524</td>
<td>.451</td>
</tr>
<tr>
<td>Sublimation</td>
<td>.122</td>
<td>.469</td>
</tr>
<tr>
<td>Eigenvalue</td>
<td>5.45</td>
<td>2.03</td>
</tr>
<tr>
<td>% Variance Explained</td>
<td>20.62</td>
<td>10.38</td>
</tr>
<tr>
<td>Common</td>
<td>20.62</td>
<td>31.01</td>
</tr>
<tr>
<td>Cumulative</td>
<td>20.62</td>
<td>31.01</td>
</tr>
</tbody>
</table>


As with the previous table, loadings smaller than .10 have been omitted. This rotation converged in 9 iterations. The Kaiser-Meyer-Olkin index for this analysis was 0.807, a value which is considered "great" by Hutcheson and Sofroniou (1999). Also the diagonal elements (KMO values for individual variables) of the anti-image correlation matrix were above .05 for all defenses (Field, 2000). Bartlett's test of sphericity, $\chi^2 = 1406.63$ at $p < .001$, was also highly significant. Another index of sampling adequacy described by Field is the determinant of the correlation matrix, which can be regarded as
a test of multicollinearity or singularity. According to Field, the determinant of the R-matrix should be greater than 0.00001. The determinant for this analysis was 0.0009844.

Selecting Items Representative of Factors

One of the purposes for this factor analytical study of the DSQ was to provide a replication of previous research concerning the internal structure of the instrument. To that end, the decision-making process regarding the retention of items representative of factors was guided by the procedure used in the DSQ manual by Bond (1991). Table 5 in the DSQ manual (Bond, 1991, p. 3) shows that only the items that were deemed representative of a given factor were involved in the calculation of the mean of that factor (however, the scores on all items composing each defense mechanism subscale were used in the calculation of the subscale means).

In this study, several criteria, some theory-driven and some empirically based, have been used in deciding which items should be retained as representative of a factor or defense style. The theory driven criteria were: (a) an item can be considered representative if its inclusion in the factor confirms the expected meaning and conceptual definition of that factor; (b) an item is highly representative of its factor if, in addition to a positive loading on that factor, it presents a negative loading on the conceptually opposite factor (Factor 1, Maladaptive Defense Style, is conceptually opposite to Factor 3, Adaptive Defense Style). The empirical criteria were: (c) items with small loadings on any one factor should not be considered representative of that factor; (d) items with small positive loadings of similar magnitude on two or three factors cannot be considered representative of any factor; (e) an item can be considered representative of its factor if its inclusion increases significantly the internal consistency of that factor.
Theoretically, an item that loads well on a particular defense subscale should also load well on the factor to which that subscale belongs. However, the complexity of the relationships among psychological variables is such that, in a small number of cases, an item may load highly on one factor while still making a positive contribution to the internal consistency of a subscale belonging to a different factor. Therefore, in evaluating the representativeness of each problematic item, the goal has been to arrive at a decision that would satisfy the majority of criteria indicated above.

From an empirical point of view, Field (2000) and Rutherford, et al. (1998), among others, consider that only factor loadings equal to or higher than .30 are appreciable. Stevens (1996), however, suggests that investigators should not use the .30 threshold blindly, but rather take sample size into consideration. He proposes that a rough check of whether a loading is statistically significant can be obtained by doubling the critical value required for significance (i.e., standard error) of an ordinary correlation. Thus, for this sample, the critical value for a correlation coefficient at $\alpha = .01$ for a two-tailed test is:

$$2 \left( \frac{1}{\sqrt{N-1}} \right) = 2 \left( \frac{1}{\sqrt{213-1}} \right) = 0.14$$  \hspace{1cm} (2)

Here are some examples to illustrate the application of each of the five criteria mentioned above. Item 39 (I am often late for appointments) shows similarly low positive loadings on both factor 2 and 3. Based on criterion (d) above, this item was not retained as representative of either factor. That decision was also based on criterion (a), acknowledging that the item had been designed as an indicator of Passive Aggression, a defense mechanism conceptualized as maladaptive (factor 1). According to criterion (e),
if item 39 was to be included as representative of factor 2, it would not significantly increase the reliability of that factor (.5998 compared to .5997).

Item 42 (*I fear nothing*) was not retained because it presented positive loadings on conceptually opposite factors [criterion (b)]. By contrast, item 2 (*I work out my anxiety through doing something constructive or creative like painting or woodwork*) was retained as representative of factor 3 due to the opposite sign loadings on the conceptually opposite factors (-.126 on factor 1 and +.323 on factor 3).

In spite of the moderate loading on factor 3 (.411), item 23 (*I ignore danger as if I was superman*) was not considered representative of that factor for the following reasons: conceptual incompatibility [criterion (a)], same sign and similar magnitude loading on conceptually opposite factor [criterion (b)], and positive loadings on all factors [criterion (d)]. By contrast, item 84 (*Sticking to the task at hand keeps me from feeling depressed or anxious*), with its loading of .236 on the Adaptive Defense factor, was retained because it reflected the conceptual expectation for this item, as well as for the defense of *Task Orientation*, which presented a high loading on factor 3.

In conclusion, the process of deciding which items should be considered representative of their factors was guided by the goal of reaching a match between the factorial loadings of items under factors and the factorial loadings of defense subscales under factors (Tables 7 and 8). In the DSQ manual, Bond (1991) reports that, out of all 79 defense-related items, 66 were considered representative of their factors and were involved in the calculation of the factor means. As a result of the factor analysis based on this sample, 64 out of 79 items satisfied the majority of the criteria specified above for inclusion in the calculation of factor means.
The Social Desirability Scale

An exploratory factor analysis was performed on the 10 items that make up the Social Desirability Scale (SDS) of the DSQ. As pointed out earlier, this analysis was deemed important in light of the implications for further research with and on the DSQ. More specifically, this investigation of the factorial structure of the SDS and the discussion of its possible interpretations represent an original contribution of this study. Of the tens of studies reviewed and cited in this research project, no study with or on the DSQ has addressed the structure or the meaning of social desirability as measured by this instrument.

The literature on the concept of social desirability, as well as the psychometric and clinical evidence coming from the use of other reputed personality measures that make use of social desirability or lie scales (such as: Minnesota Multiphasic Personality Inventory, Eysenck Personality Inventory, Comrey Personality Scales, and California Psychological Inventory) point out to the complex nature of the construct. In an excellent review of this topic, Paulhus (1984) showed that numerous factor analytic studies of social desirability scales identified two distinct factors, termed the Alpha and Gamma factors. The former represents relatively unconscious bias in self-reporting (self-deception), whereas the latter reflects more deliberate falsification (other-deception, or, as Paulhus terms it, impression management).

In this respect, the DSQ is no exception, and the results of the principal components analysis performed on this social desirability scale revealed the existence of two factors. Table 9 shows the item loadings for the two components of the Social Desirability scale.
Table 9  Principal Component Loadings of the Social Desirability Scale  
(N = 213)

<table>
<thead>
<tr>
<th>Item</th>
<th>Component 1</th>
<th>Component 2</th>
<th>FUL</th>
</tr>
</thead>
<tbody>
<tr>
<td>38 Sometimes at elections I vote...</td>
<td>.734</td>
<td></td>
<td>.510</td>
</tr>
<tr>
<td>26 Sometimes when I am not feeling well...</td>
<td>.716</td>
<td></td>
<td>.536</td>
</tr>
<tr>
<td>20 I get angry sometimes.</td>
<td>.575</td>
<td>.396</td>
<td>689</td>
</tr>
<tr>
<td>57 I would be very nervous if an airplane...</td>
<td>.326</td>
<td></td>
<td>223</td>
</tr>
<tr>
<td>31 I do not always tell the truth.</td>
<td>1.17</td>
<td>789</td>
<td>.634</td>
</tr>
<tr>
<td>14 Once in a while I think of things...</td>
<td>615</td>
<td></td>
<td>.503</td>
</tr>
<tr>
<td>44 I would rather win than loose in a game.</td>
<td>665</td>
<td></td>
<td>.380</td>
</tr>
<tr>
<td>15 Once in a while I laugh at a dirty joke.</td>
<td>409</td>
<td>415</td>
<td>.583</td>
</tr>
<tr>
<td>6 Once in a while I put off...</td>
<td>.313</td>
<td>366</td>
<td>.479</td>
</tr>
<tr>
<td>48 I do not read every editorial...</td>
<td>.182</td>
<td>310</td>
<td>.346</td>
</tr>
<tr>
<td>Eigenvalue</td>
<td>2.373</td>
<td>1.218</td>
<td></td>
</tr>
<tr>
<td>% Variance Explained</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Common</td>
<td>23.73</td>
<td>12.179</td>
<td></td>
</tr>
<tr>
<td>Cumulative</td>
<td>23.73</td>
<td>35.909</td>
<td></td>
</tr>
</tbody>
</table>


The indices of sampling adequacy supported the appropriateness of the factor analysis: KMO = .703; determinant = .390. Bartlett’s test of sphericity was also highly significant, $\chi^2 = 195.878$ at $p < .001$. The rotation converged in 3 iterations, and the solution explained 35.9% of the variance. The two factors thus identified represent two subscales of the general SDS, tentatively labelled *Self-Deception* and *Impression Management*, in accordance with Paulhus’s (1984) terminology.
In Table 9 above, values in bold characters indicate the items that were retained as representative of their factor, based on their contribution to the internal consistency of that factor. In spite of its loading value of .326, item 57 was not considered representative of the first factor due to its negative contribution to the internal consistency of that factor: the addition of item 57 would lead to a decrease in the Cronbach alpha coefficient from .5619 to .5111.

Finally, Cattell’s (1966) scree test clearly indicates the presence of two factors, as shown in Fig. 6 below.

**Figure 6**  
*Scree Plot of the Principal Component Analysis on Social Desirability Items (N = 213)*

**Summary**

The determination of the final factor solution for the DSQ for this sample was based on a number of statistical data-driven considerations, as well as on theory-driven criteria. The results obtained with a four-factor model were difficult to interpret
theoretically, with respect to the meaning of the underlying constructs represented by factors 2 and 3. Also, the assignation of defenses to factors 2 and 3 did not replicate the compositions obtained in any previous studies, or in the DSQ manual. In contrast, the rotated three-factor solution produced a match between the factorial structure of the 78 DSQ items (excluding the 10 items that make up the Social Desirability Scale) and that of the 24 individual defenses. This three-factor solution confirms the results obtained in the majority of the previous studies on the internal structure of the DSQ (see references cited in connection with the Defense Style Questionnaire under the section Instruments above).

To summarize, the principal components analyses performed on the participants’ responses to the DSQ revealed the existence of three factors (Maladaptive Defenses, Neurotic Defenses, and Adaptive Defenses) that encompass, in a conceptually meaningful and empirically accurate way, 24 individual defense mechanisms. In addition, the Social Desirability Scale included in the instrument was found to consist of two factors, tentatively labelled as Self-Deception and Impression Management. Basic psychometric data (such as intercorrelations among defense factors) are provided in the Instruments section of the Methodology chapter. More detailed information on the psychometric characteristics of the DSQ is provided in Appendix IV.

**Study 2: Correlational Analysis**

*Introduction: The Research Questions*

This study addresses the main research questions concerning the relationship between psychological types, as measured by the MBTI, and ego defense structures, as measured by the DSQ. Given the factorial structure of defensive organization identified
in Study 1, this investigation can now address the following two research questions: (1) *What is the association between psychological and ego defense styles?* and (2) *What is the association between psychological and ego defense mechanisms?*

**Variables and the General Hypothesis**

There are 7 independent variables (predictors) in this study: the 4 bipolar psychological type dimensions (as measured by the MBTI), gender, age, and education. The dependent variables (outcome) are the scores on the 3 defense styles or factors and the scores on the defense mechanism subscales of interest (as measured by the DSQ).

In the literature on personality, there has been some debate over the treatment of psychological types as either continuous or categorical variables (see in particular the *type vs. trait* distinction) (Eysenck, 1957; Loomis & Singer, 1980; Quenk, 1993; Romney & Bynner, 1992). Since Jungian theory (Jung, 1921/1971) and its operationalization through the MBTI conceive of typological preference as a response on a bipolar continuum, scores are obtained on both directions of each bipolar dimension and the lower score is subtracted from the higher score. Thus, for example, the resulting difference score on the *Extraversion - Introversion* dimension of 20 in favour of the *Extraversion* direction has been entered as + 20, whereas a similar *Introversion* score would have been entered as - 20. Therefore, with the exception of Gender, all variables in this study are continuous variables.

The nature of the hypothesized relationship between the independent variables and the dependent variables in this study warrants special attention. Since both personality type and the reported preference towards a particular defense mechanism, or set of defenses, are seen as internal personality characteristics, it is difficult to
conceptualize either of them as the cause of the other. Both self-report measures used in this study are psychometric instruments developed against the background of psychodynamic theories of personality: the Freudian tradition (ego defenses) and the Jungian analytical school (psychological types). As such, they identify behavioural correlates of postulated underlying or unconscious structures. The respondents’ endorsement of a particular typology or a particular defensive organization is seen as the effect of some other underlying causes (genetic, environmental, or a combination of both). However, the assumption of causality between the two sets of constructs is untenable due to the fact that no temporal or developmental sequence is conceivable between the independent and the dependent variables. In other words, there is no theoretical or empirical evidence to suggest that the development of ego defenses precedes personality type formation, or vice-versa. Therefore, this study was not intended to test causal hypotheses, but rather, the pattern of association between these variables. In other words, no mediators can be identified among the variables involved in this study.

As mentioned before, through the Demographic Information Form data were collected on the participants’ age, gender, and levels of education. Apart from the fact that these demographic data are routinely collected in research surveys, their inclusion in this study was also based on statistically significant findings in previous studies using the DSQ. For example, Watson and Sinha (1998) noted differences for gender on certain individual defenses, namely on the suppression, pseudo-altruism, and isolation scales. Gender differences were also revealed in a study by Feldman, Araujo, and Steiner (1996) designed to examine defense structure as a function of age, sex, and mental health status. Previous studies have also shown consistent associations between age and defense styles
or factors (e.g., Andrews, Singh, & Bond, 1993; Nasserbakht, Araujo, & Steiner, 1996; Watson & Sinha, 1998). As such, based on the evidence in the literature, the present study was expected to support the general view that defensive organization represents a manifestation of development, whereby immature or maladaptive defenses are associated with earlier developmental stages, while more adaptive defenses are associated with later stages of development (Vaillant, 1992). Both Age and Education were hypothesized to be involved in positive correlations with higher levels of defense maturity and adaptation.

The inclusion of both Age and Education as variables in this study was also based on the following rationale. Unlike the MBTI, the DSQ is a measure of levels of "maturity" or "adaptiveness" in the way people respond to perceived emotional discomfort or stress. By collecting data on the participants' biological age and their level of education, this study attempted to clarify the meaning of such phrases as developmental level, maturity, or adaptiveness in reference to the structure of defensive organization.

Any of the demographic variables Age, Gender, and Education can act as moderators of the relationship between defense structures and psychological type variables. In order to test the presence of moderator effects, interaction terms were built between demographic variables and psychological type variables. Aiken and West (1991), as well as Lindley and Walker (1993), provided detailed discussions of the estimation, testing, and probing of interactions in regression models. More details concerning the methodological implications of the presence of moderators in statistical analyses have been provided below in the chapter entitled Analysis and Results.
Stated simply, the general hypothesis of this study is that there is a statistically significant pattern of association between psychological types and ego defense structures. This general hypothesis can be subdivided into a number of specific hypotheses, pairing certain typological dimensions with certain defense structures. Those specific hypotheses are presented at the beginning of each of the following two sections. Given the absence of previous studies on the association between defenses and psychological types, it must be emphasized that these hypotheses can only be viewed as tentative statements and that the fundamental nature of this study remains an exploratory one.

*The first specific research question: Are psychological types associated with defense styles?*

**Specific Hypothesis**

One hypothesis to be tested in this study, which stems from the Jungian theory and its operationalization through the MBTI, is that psychological type dimensions are not expected to be associated with defense factors. In other words, it was not expected that thinking types would be more likely than feeling types to adopt immature defenses or mature defenses. The MBTI authors (Myers, 1992; Myers, et al., 1998) make it explicit that each preference within a bipolar type dimension is equally desirable and, at the same time, has potential weakness when used in excess. A possible exception may be the Introversion attitude, which has been found in previous research to be correlated with higher scores on Neuroticism (Costa & McCrae, 1992; McCrae & Costa, 1989).

**Analyses and Results**

To begin with, the pattern of zero-order correlations between the three demographic characteristics and the participants’ scores on the defense factors can
provide an initial estimate of the degree of individual associations between these variables. Table 10 shows the results of this analysis. The disattenuated correlations are given in brackets.

These results indicate that men are statistically more likely than women to adopt maladaptive defenses, while women are statistically more likely than men to use neurotic defenses. Based on the results of this bivariate correlation analysis, no statistically significant difference was noticed between men and women with respect to their use of adaptive defense strategies. The demographic variables Age and Education, have been found to be significantly correlated with the participants' reported pattern of defensive organization: the use of maladaptive defenses tended to decrease with age and higher levels of education. No statistically significant variations were reported in the use of neurotic defenses among participants of different ages or levels of education. The same pattern of correlations (between neurotic defenses on the one hand and age and levels of education on the other hand) was revealed when the sample was split by Gender.

Similarly, as a descriptive measure of association, the pattern of zero-order correlations between type dimensions and defense styles was examined. Table 11 shows

Table 10  *Bivariate Correlations between Gender, Age, Education, and Defense Styles (N = 213)*

<table>
<thead>
<tr>
<th></th>
<th>Gender</th>
<th>Age</th>
<th>Education</th>
</tr>
</thead>
<tbody>
<tr>
<td>Style 1: Maladaptive</td>
<td>-.237 (-.248) **</td>
<td>-.366 (-.384) **</td>
<td>-.227 (-.238) **</td>
</tr>
<tr>
<td>Style 2: Neurotic</td>
<td>.209 (.270) **</td>
<td>-.043 (-.055)</td>
<td>-.075 (-.097)</td>
</tr>
<tr>
<td>Style 3: Adaptive</td>
<td>.113 (.149)</td>
<td>.142 (.187) *</td>
<td>.129 (.170)</td>
</tr>
</tbody>
</table>

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).
Table 11  
Bivariate Correlations between Type Dimensions and Defense Styles (N = 206)

<table>
<thead>
<tr>
<th></th>
<th>E - I</th>
<th>S - N</th>
<th>T - F</th>
<th>J - P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Style 1: Maladaptive</td>
<td>-.31 (-.35)**</td>
<td>.37 (.40)**</td>
<td>.19 (.21)**</td>
<td>.15 (.16)*</td>
</tr>
<tr>
<td>Style 2: Neurotic</td>
<td>.05 (.06)</td>
<td>-.06 (-.08)</td>
<td>-.29 (-.39)**</td>
<td>-.09 (-.20)</td>
</tr>
<tr>
<td>Style 3: Adaptive</td>
<td>.09 (.12)</td>
<td>-.27 (-.36)**</td>
<td>.02 (.03)</td>
<td>-.16 (-.22)*</td>
</tr>
</tbody>
</table>

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

the observed and disattenuated (in brackets) correlations between the 4 bipolar psychological type dimensions and the 3 defense styles.

These results show that, in this sample, the introverted type, the sensing type, and to a lesser extent, the thinking type, and the judging type are each positively correlated with the cluster of maladaptive defenses. However, the thinking type appears to be negatively correlated with the neurotic cluster of defenses. In addition, there are small but statistically significant correlations between the intuitive type and adaptive defenses and between the perceiving type and adaptive defenses.

Zero-order correlations are informative as indices of association between two individual variables, but they do not express the predictive power of variables. The bivariate correlational analyses described above are very useful research tools in that they identify directions for further statistical analysis. Bivariate correlational analysis cannot answer the question: how great is the contribution of each of the four type dimensions when they are considered together in the explanation of the variance observed in a defense score? In order to address that question, multiple regression analysis was used.
Multiple regression analysis (MR) has been found to be the appropriate statistical tool for this study due to its ability to deal with a variety of variables: categorical, continuous, or a combination of both. As Pedhazur (1997) remarks, MR "eschews the inappropriate or undesirable practice of categorizing continuous variables (e.g., designating individuals above the mean as high and those below the mean as low) in order to fit them in what is considered, often erroneously, an ANOVA design" (p. 4). Also, MR is eminently suited for analyzing the collective and separate effects of two or more independent variables on a dependent variable. This is particularly advantageous in this study, where the simultaneous operation of four personality dimensions within a typological profile is of great interest. Conversely, path analysis or structural equations modelling do not appear to be appropriate strategies due to their reliance on causal assumptions (albeit reciprocal causation).

In the absence of any theoretical rationale for the order of entry of predictors, the stepwise method of entering variables was used. Tabachnick and Fidell (1989) recommended the stepwise regression as an important early stage of model building, as well as in detecting multicollinearity or singularity. As Stevens (1996) explains, "at each stage of the procedure, a test is made of the least useful predictor. The importance of each predictor is constantly reassessed. Thus, a predictor that may have been the best entry candidate earlier may now be superfluous" (p. 81). Therefore, in the absence of strong theoretical reasons for ordering the entry of variables, stepwise regression is considered the surest path to the best prediction equation. An additional reason for deciding in favour of the stepwise method has to do with the possibility of detecting suppressor effects. Field (2000), states that "forward selection is more likely than backward elimination to
exclude predictors involved in suppressor effects” (p. 169). In that sense, the stepwise forward method may run the risk of making a type II error, while it decreases the risk of making a type I error.

**Maladaptive Defense Style.**

The first multiple regression analysis included the participants’ scores on Factor 1 – Maladaptive Defenses as the outcome (criterion) variable and the three demographic variables, Gender, Age, and Education as predictors. Table 12 shows the results of that analysis.

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>4.809</td>
<td>.267</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>-0.343</td>
<td>.005</td>
<td>-0.343**</td>
</tr>
<tr>
<td>Gender</td>
<td>-0.398</td>
<td>.128</td>
<td>-0.197*</td>
</tr>
</tbody>
</table>

Note. $R^2 = .172; \text{Adjusted } R^2 = .164; \text{** } p < .001; \text{* } p < .01$

These results indicate that Age and Gender explain 17% of the variance observed in the participants’ scores on the Maladaptive Defense cluster. The negative regression coefficients indicate that as age increases there is a decrease in the reporting of maladaptive defenses, and that men score significantly higher than women on the Maladaptive Defense cluster. In order to test the hypothesis that knowledge of participants’ scores on psychological types increases significantly our ability to predict their scores on the maladaptive defense factor, a multiple regression analysis was performed with all seven predictors, 4 type dimensions and 3 demographic variables. Table 13 shows the results of this second analysis.
Table 13  Summary of Stepwise Regression Analysis for All Variables
Predicting Maladaptive Defenses (N = 206)

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>4.763</td>
<td>.286</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>-.028</td>
<td>.005</td>
<td>-.329**</td>
</tr>
<tr>
<td>E-I</td>
<td>-1.023</td>
<td>.229</td>
<td>-.262**</td>
</tr>
<tr>
<td>S-N</td>
<td>1.068</td>
<td>.220</td>
<td>.283**</td>
</tr>
<tr>
<td>Gender</td>
<td>-.303</td>
<td>.118</td>
<td>-.150*</td>
</tr>
</tbody>
</table>

Note. $R^2 = .341$; Adjusted $R^2 = .328$; ** $p < .001$; * $p < .05$.

The predictive power doubled in this model, as attested by the value of the $R^2$. Age, E-I, S-N, and Gender explain 34.1% of the variance observed in the participants’ scores on the maladaptive defense factor. This second analysis provided the best model fit for explaining the variance in maladaptive defense scores and it will be described in full detail.

The Adjusted $R^2$ is important if the results of this analysis are to be generalized beyond this sample. Adjusted $R^2$ indicates how much of the variance in the outcome (scores on maladaptive defenses) is accounted for if the model had been derived from the population from which this sample was taken. The Adjusted $R^2$ value reported above for this model (.328) was calculated by SPSS using Wherry’s equation; however, both Field (2000) and Stevens (1996) recommend the use of Stein’s formula, which is an index of cross-validation (i.e., it shows how well the model can predict scores of a different sample of data from the same population). Stein’s formula is:

$$Adjusted R^2 = 1 - \left[ \left( \frac{n - 1}{n - k - 1} \right) \left( \frac{n - 2}{n - k - 2} \right) \left( \frac{n + 1}{n} \right) \right] (1 - R^2)$$ (3)
where $R^2$ is the unadjusted value, $n$ is the number of participants and $k$ is the number of predictors in the model. For this model, the Adjusted $R^2$ calculated by this formula is .311.

The Durbin-Watson statistic of 1.879 indicates that the assumption of independent errors was met (acceptable values range between 1 and 3, with ideal values being as close to 2 as possible). The $F$ ratio of 26.046 (4, 201) was significant at $p < .001$. Therefore, the model significantly improved the prediction of the outcome variable, and can be expressed by the following formula:

$$\text{Maladaptive Style} = \alpha + b_1 \text{Age}_i + b_2 \text{EI}_i + b_3 \text{SN}_i + b_4 \text{Gender}_i = 4.786 + (-0.028 \text{Age}_i) + (-0.024 \text{EI}_i) + (0.020 \text{SN}_i) + (-0.303 \text{Gender}_i)$$

(4)

The $b$ values explain the relationships between scores on maladaptive defenses and each predictor. Age ($b = -0.028$): this value indicates that with each one unit decrease in age, a participant’s score on maladaptive defenses increases by 0.028 points. Extraversion - Introversion ($b = -0.024$): this value indicates that as a participant’s score increases by one point in the Introversion direction, his or her score on maladaptive defenses increases by 0.024 points. Sensing - Intuiting ($b = 0.020$): this value indicates that as a participant’s score increases by one unit in the Sensing direction, the maladaptive defense score increases by 0.020 points. Gender ($b = -0.303$): this value indicates that every male participant can expect an additional increase on the maladaptive defense score of 0.303 points (the variable Gender was recoded: 2 = female; 1 = male).

The standardized $\beta$ coefficients reflect the relationship between predictors and outcome in terms of standard deviations and, as such, give a better insight into the relative contribution of each variable. For example, as a score on the Sensing - Intuiting dimension increases by one standard deviation (13.86), the score on maladaptive defense
style increases by 0.283 standard deviations. The standard deviation of Style 1 – Maladaptive Defenses is 1.007, so this constitutes a change of 0.285 points (0.283 multiplied by 1.007).

The SPSS output provides the zero-order, partial, and semipartial (or part) coefficients for the predictors entered in the model. These values can be checked in order to detect the presence of a suppressor variable. The concept of suppression refers to the effect of a variable that has a zero, or close to zero, correlation with the criterion and which, paradoxically, leads to improvement in prediction when included in the multiple regression analysis (Woolley, 1997). This happens when the variable in question is correlated with one or more than one of the predictor variables. As Pedhazur (1997) explains, “the inclusion in the equation of a seemingly useless variable, so far as prediction of the criterion is concerned, suppresses, or controls for, irrelevant variance, that is, variance that it shares with the predictors and not with the criterion, thereby ridding the analysis of irrelevant variation, or noise – hence, the name suppressor variable” (p. 186). Statisticians have noted that the definition and interpretation of suppressor variables in multiple regression analysis remains a controversial issue (Holling, 1983; Smith, Ager, & Williams, 1992; Tzelgov & Henik, 1991). Pedhazur (1997) summarises the controversy to essentially two definitions. A variable qualifies as a suppressor: (a) when its inclusion in a multiple regression analysis leads to a standardized regression coefficient of a predictor to be larger than it is in the absence of the suppressor variable; and (b) when the semipartial correlation of the criterion and a predictor is larger than the corresponding zero-order correlation.
In light of the second definition provided above, a check for possible suppression effects was performed by examining the coefficients table. The coefficients table provided in the SPSS output indicates that no semipartial coefficient (-0.325, -0.255, 0.277, and -0.147) is larger than the corresponding zero-order coefficient (-0.366, -0.313, 0.366, and -0.237) for any of the four predictors in this model (Age, EI, SN, and Gender, respectively).

In order to assess the assumption of no multicollinearity, several statistics provided on the SPSS output were checked. The variance inflation factor (VIF) has a value of 1.00 when the two variables (predictors) are not correlated. The higher the correlation between two predictors, the greater the inflation of the variance of the $\beta$ (Pedhazur, 1997). Field (2000) indicates that the average VIF should not be significantly greater than 1 if the regression is unbiased. He gives the following formula, into which the values obtained in this analysis can be entered:

$$
\frac{\sum_{i=1}^{k} VIF_i}{k} = \frac{1.031 + 1.050 + 1.039 + 1.036}{4} = \frac{4.156}{4} = 1.039
$$

The average VIF is very close to 1 and that indicates that collinearity is not a problem for this model. Also, the tolerance statistics are all well above the 0.2 threshold indicated by Menard (1995). Those values are: 0.970, 0.953, 0.963, and 0.966, for Age, EI, SN, and Gender, respectively.

In addition to the Durbin-Watson statistic mentioned above, there are some visual checks that can attest the absence of collinearity within the data and the independence of residuals. Figure 7 shows the distribution of the standardized residuals (ZRESID), or errors (i.e., standardized differences between the observed data and the values predicted
by the model, plotted against the standardized predicted values of the outcome variable (ZPRED). The plot shows that the assumption of homoscedasticity has been met.

Normality of residuals can also be checked by means of a histogram. Figure 8 shows the
normal distribution of the standardized residuals for the outcome variable.

The normal distribution of residuals can also be checked with the normal probability plot. Figure 9 shows the straight line representing the normal distribution, and the points representing the observed residuals.

Figure 9  

Normal P-P Plot of Standardized Residuals for Outcome Variable: 
Maladaptive Defense Style

Several casewise diagnostics were performed in order to assess the impact of outliers. Ten extreme cases were identified, the standardized residuals of which were either less than −2 or greater than 2, i.e., scores on the maladaptive defense factor falling outside of the range of ± 2 standard deviations. (In an ordinary sample, 95% of the cases are expected to have standardized residuals within ± 2. Applying this logic to this sample, the number of expected extreme cases would be 10.25.) The 10 extreme cases were investigated in terms of their influence statistics.
Cook’s distance is a statistic that considers the effect of a single case on a model. Cook and Weisberg (1982) have suggested that values greater than 1 present cause for concern. In this sample, all ten extreme cases have a Cook’s distance well under 1 (in fact ranging from 0.019 to 0.086), so none of these cases is having an undue influence on the model.

The leverage (or hat elements) is a statistic that reflects the influence of the observed value of the outcome variable over the predicted values, and the average leverage is defined as \((k + 1) / n\) in which \(k\) is the number of predictors and \(n\) is the number of cases. Hoaglin and Welsch (1978), as well as Field (2000), recommend that values greater than twice the average should be cause for concern, whereas Stevens (1996) suggests the more lenient cut-off of three times the average leverage. For this sample the more stringent criterion means a cut-off point of 0.048 \([2(k + 1) / n]\). The values for this sample indicated on the SPSS output under the rubric Centered Leverage Value range from 0.005 to 0.047, which indicates that none of these outliers have an undue influence on the model.

Mahalanobis distances measure the distance of cases from the means of the predictors. Based on the guidelines by Barnett and Lewis (1978), a value greater than 18 may be a cause for concern in a sample of 206 participants and with 4 predictors. All the Mahalanobis distances in this model range between 1.1 and 10.7, which again suggests that there are no influential cases within these data.

The difference between a parameter estimated using all cases and the same parameter estimated when one outlier case is excluded is known as DFBeta in SPSS. The DFBeta is calculated for every case and for each of the parameters in the model. With the
standardized values of $DFBetas$ an absolute value above 1 indicates a case that substantially influences the model parameters (although Stevens [1996] suggests considering absolute values greater than 2). For this model, all $DFBeta$ values range between 0.01 and 0.50, which shows that none of the outliers have an undue influence on the model parameters. A related statistic is $DFFit$, which represents the difference between the predicted value for a case when the model is calculated including that case and when the model is calculated excluding that case. Again, the standardized $DFFit$ values in this model range between 0.00 and 0.68.

Finally, the covariance ratio (CVR) measures whether a case influences the variance of the regression parameters. Belsey, Kuh, and Welsch (1980) suggested the following interpretation of this diagnostic:

- If $CVR_i > 1 + [3(k + 1) / n]$ then deleting the $i$th case will damage the precision of some of the model's parameters;
- If $CVR_i < 1 - [3(k + 1) / n]$ then deleting the $i$th case will improve the precision of some of the model's parameters.

For this model the guidelines indicated above translate into the interval: 1.073 to 0.927, which includes five out the ten extreme cases. The CVR values for the other five cases fall just below 0.927 (the lowest being 0.781), which, according to Field (2000), should not represent a cause for concern given the excellent Cook's distance values for those same cases.

The last step in the analysis of the relationship between the outcome/criterion (scores on maladaptive defenses) and the seven predictor variables (4 type variables and 3 demographic variables) was to check for possible moderator effects, i.e., effects of
interactions between type variables and demographic variables. Any of the three
demographic variables, *Age, Gender, and Education*, can act as a moderator, i.e., as an
additional variable (*Z*) that influences the relationship between a predictor variable (*X*)
and an outcome variable (*Y*). As Lindley and Walker (1993) explain, "the moderator may
be either a categorical or a continuous variable. It may act to reduce the magnitude and/or
to reverse the direction of the relationship between the predictor and the outcome
variables" (p. 276). In other words, the moderator effect highlights an existing interaction
between a predictor and a moderator variable, whereby the relationship between that
predictor and an outcome variable differs depending on the level of the moderator. As
Lindley and Walker (1993) put it, "the effect of *X* on *Y* is *conditioned* upon the level of
*Z*" (p. 276).

Following the procedure indicated by Aiken and West (1991), Lindley and
Walker (1993), Lubinski and Humphreys (1990), as well as Pedhazur (1997), a
hierarchical multiple regression analysis was performed, with the first block including a
stepwise analysis of the seven predictors and the second block representing a stepwise
analysis of the 12 interaction terms (4 type variables by 3 demographic variables). As
Lubinski and Humphreys pointed out, when interaction terms are included in the
equation, the analysis is bound to reveal spurious moderator effects due to
multicollinearity (correlations between interaction terms and single predictors). In order
to avoid this result, Aiken and West suggested that the hierarchical multiple regression of
outcome must be done on centred predictors, centred moderators, and interaction terms.
That analysis was performed and it yielded exactly the same results as the ones presented
above for the MR without interaction terms. In other words, the interaction terms did not
survive the analysis and were excluded from the regression equation. The model included the same predictors (Age, E-I, S-N, and Gender) and had the same predictive power ($R^2 = .341$ and $Adjusted R^2 = .328$). It was, therefore, concluded that no moderator effects were present in the final model.

_Neurotic Defense Style._

The analytical procedure described above was repeated for the other two outcome variables: Factor 2 – Neurotic Defenses and Factor 3 – Adaptive Defenses. The results of the zero-order correlations already indicated that there was a statistically significant correlation between the participants' scores on Neurotic Defenses and their scores on the Thinking – Feeling dimension ($r = -.30^{**}$) as well as between that factor and Gender ($r = -.285^{**}$) (see Tables 11 and 10 above).

A multiple regression analysis using only the demographic variables to predict participants' scores on Factor 2 – Neurotic Defenses yielded the results shown in Table 14. The same results were obtained regardless of the method of variable entry.

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>4.308</td>
<td>.203</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>.385</td>
<td>.124</td>
<td>.209^{**}</td>
</tr>
</tbody>
</table>

Note. $R^2 = .044$; $Adjusted R^2 = .039$; ** $p < .001$.

This result shows that, in the absence of typological variables as predictors, Gender explains 4.4% of the variance in participants' scores on the Neurotic Defense Factor. It was hypothesized that knowledge of the participants' typological characteristic would increase the amount of variance explained. However, since this investigation
raised a more complicated issue regarding the presence of a suppression situation, the hierarchical regression procedure, which yielded a mis-specified model, will be presented first.

Following the same procedure indicated by Aiken and West (1991), in block 1, the seven centred predictors (4 type variables and 3 demographic variables) were entered into the model by means of the stepwise method. Block 2 included the 12 interaction terms and the squared terms, also entered in a stepwise fashion. The second step of this analysis revealed a model with two retained predictors: Thinking – Feeling and the interaction term TF*Gender (see Table 15 below). The total variance explained by this model was 10.6% with the inclusion of the interaction term, an $R^2$ change of .025, which was statistically significant at $p = .019$.

Table 15  Summary of Hierarchical Stepwise Regression Analysis for All Variables Predicting Neurotic Defenses ($N = 206$)

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>$\beta$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>5.315</td>
<td>.113</td>
<td></td>
</tr>
<tr>
<td>T-F</td>
<td>-1.001</td>
<td>.236</td>
<td>-.285**</td>
</tr>
<tr>
<td>Step 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>5.277</td>
<td>.113</td>
<td></td>
</tr>
<tr>
<td>T-F</td>
<td>-1.799</td>
<td>.411</td>
<td>-.512**</td>
</tr>
<tr>
<td>T-F X Gender</td>
<td>.607</td>
<td>.257</td>
<td>.276*</td>
</tr>
</tbody>
</table>

Note. $R^2 = .081$; Adjusted $R^2 = .077$; * $p < .05$, ** $p < .001$.

In spite of the Durbin-Watson statistic of 2.055 indicating that the assumption of independent errors was met, the collinearity statistics revealed the presence of multicollinearity for Step 2: the tolerance index was .333 and the Average VIF index was
3.098, the latter being significantly different from 1 (Bowerman & O'Connell, 1990). In addition, the semipartial correlations of both predictors (T-F and the interaction term TF*Gender) were larger than the corresponding zero-order correlations: -.291 and .157 compared to -.285 and -.145, respectively. This, according to Holling (1983) and Velicer (cited in Pedhazur, 1997) is an indication of the presence of a suppression effect. Finally, Tzelgov and Henik (1991) state that “when a variable is suppressed, its indirect effect has a sign different from its validity” (p. 528) – which is the case with the interaction term in this model. Darlington (cited in Tzelgov & Henik, 1991) used the term negative suppression to designate the case when a variable has a positive correlation with the criterion but receives a negative $\beta$ weight in the multiple regression equation. The model mis-specification can also be seen by examining the scatterplot of residuals, which shows a clear case of heteroscedasticity (Fig. 10).

Figure 10  Scatterplot for Outcome Variable: Neurotic Defense Style (Heteroscedasticity) (All Variables Entered)
Given the presence of multicollinearity and heteroscedasticity, the model described in Step 2 was rejected, as was the hypothesis regarding the presence of a moderator effect. Also, given the suppression effect described above, the interaction term $T-F \times Gender$ was rejected as a valid predictor of the participants' scores on the Neurotic Defense Factor, and the best specified model was considered to be the one described in Step 1. This model suggests that the Thinking–Feeling type dimension is the only statistically significant predictor associated with the participants' scores on the Neurotic Defense Factor and that it explains 8.1% of the variance observed in those scores. For cross-validation purposes, if a different sample was to be taken from the same population, the model would be able to explain 6.7% of the variance ($Adjusted R^2$ calculated with Stein's formula; see equation [3]). The main effect of the Thinking-Feeling dimension, $F = 17.998 (1, 204)$, was statistically significant at $p < .001$.

This well-specified model can be expressed as:

$$\text{Neurotic Style} = \alpha + b_1TF_i = 5.315 + (-1.001 \text{ TF})$$ (6)

which means that, as a participant's score increases by one unit in the Thinking direction, the score on the Neurotic Factor decreases by 1.001 points. Or, expressed in terms of the standardized $\beta$ coefficient, as the score on the Thinking–Feeling dimension increases by one standard deviation (i.e., 12.51), the score on the neurotic factor decreases by 0.285 standard deviations. The standard deviation for Factor 2 – Neurotic Defenses is 0.9161, so this constitutes a change of 0.261 points (0.285 multiplied by 0.9161).

The assumption of independent errors was met, as indicated by the Durbin-Watson index of 2.072. The assumption of constant variance of residuals (homoscedasticity) was also met as illustrated by the scatterplot in Figure 11. Normality
of residuals for this model can also be checked through the histogram representing the distribution of standardized residuals, as shown in Figure 12.

Figure 11  Scatterplot for Outcome Variable: Neurotic Defense Style
(Homoscedasticity) (All Variables Entered)

Figure 12  Histogram of Outcome Variable: Neurotic Defense Style
The investigation of extreme cases identified the presence of 8 outliers, i.e., scores on the neurotic defense factor falling outside of the ±2 standard deviation range. As with the Maladaptive Defense Factor, the indices examined were: Cook's distance, leverage, Mahalanobis distances, DFBeta values, DFFit values, and covariance ratio. The casewise diagnostics examination concluded that none of the 8 cases had an undue influence on the model.

The results of the hierarchical regression analysis and the pattern of zero-order correlations between Gender, T-F, and Factor 2, suggested the need to compare different models based on two different methods of entering predictors into the regression equation. The predictors targeted this time were T-F and Gender. Field (2000) pointed out that "forward selection is more likely than backward elimination to exclude predictors involved in suppressor effects" (p.169). As suggested by Field, the analyses using the stepwise and the forward methods yielded exactly the same result, that of retaining only the T-F predictor. The analysis using the backward elimination of variables (which is tantamount to using the enter method, by including the T-F predictor first and the Gender predictor second) retained both predictors:

Table 16  Summary of Backward Regression Analysis for All Variables

Predicting Neurotic Defenses (N = 206)

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>( \beta )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>4.437</td>
<td>.204</td>
<td></td>
</tr>
<tr>
<td>T-F</td>
<td>-.018</td>
<td>.005</td>
<td>-.244**</td>
</tr>
<tr>
<td>Gender</td>
<td>.251</td>
<td>.129</td>
<td>.136</td>
</tr>
</tbody>
</table>

Note. \( R^2 = .098; \) Adjusted \( R^2 = .089; \) ** p < .001.
Although this model had a relatively higher predictive power (variance explained was almost 10%), and although all indices regarding the regression assumptions were satisfactory (independence of errors, normality of residuals, acceptable casewise diagnostics), this model could not be retained due to the statistical significance level for the change in $R^2$ brought about by the second variable, *Gender*: the standardized regression coefficient for *Gender* ($\beta = .136$) was significant at the $p = .053$.

To reiterate, the well specified model explaining the variance in the participants' scores on the Neurotic Defense factor is represented by Equation 6 on page 111 above.

*Adaptive Defense Style.*

The last set of associations to be examined was between participants’ scores on *Factor 3 – Adaptive Defenses* and their scores on the typological measure and the demographic variables. The initial zero-order correlations identified a small positive correlation between Factor 3 scores and *Age* ($r = .142$) and a small negative correlation between the same factor and *J-P* ($r = -.160$). Both of those correlations were significant at $p < .05$. A somewhat higher negative correlation was identified between Factor 3 and *S-N* ($r = -.265$), which was statistically significant at $p < .01$.

When only the 3 demographic variables were entered (stepwise) as predictors in the regression equation, the result showed that 2% of the variance in the participants’ scores on *Factor 3 – Adaptive Defenses* was explained by the variable *Age*. The main effect was statistically significant, $F = 4.346$ (1, 212), $p = .038$. It was hypothesized that the addition of the psychological type variables would increase the predictive ability of the model.
As with the previous moderator analysis for Factor 2, the hierarchical multiple regression of criterion (Factor 3 – Adaptive Defenses) on all predictors, including interaction and squared terms, proceeded as outlined by Aiken and West (1991). That analysis yielded a model that retained two predictors: S-N and the interaction term T-F X Gender. However, the presence of a suppression situation was again detected, by the fact that the semipartial correlations of each of these two predictors with the criterion were greater than their corresponding validities (zero-order correlations): (-.307 and .174 compared to -.265 and .079, respectively). As such, it was concluded that the interaction term produced a spurious effect, and that the best fit model was represented by the predictive equation including only the S-N term. That model explained 7% of the variance in the Adaptive Defense scores (Adjusted $R^2 = .066$), which represents an improvement over the predictive ability of the demographic variables alone. Table 17 shows the results of the best-specified model for Factor 3 – Adaptive Defenses.

Table 17  
Summary of Stepwise Regression Analysis for All Variables Predicting Adaptive Defenses ($N = 206$)

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>(\beta)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>6.384</td>
<td>.115</td>
<td></td>
</tr>
<tr>
<td>S-N</td>
<td>-1.051</td>
<td>.268</td>
<td>-.265**</td>
</tr>
</tbody>
</table>

Note. $R^2 = .070; Adjusted R^2 = .066; ** p < .001.$

This model had an $F$ ratio of 15.388 (1, 204), which was statistically significant at $p < .001$. Therefore, the final model can be expressed as:

\[
\text{Adaptive Style} = \alpha + b_1S_N = 6.384 + (-1.051 S_N)
\]  

which means that for every one-unit increase in the participants’ score in the Intuition direction, their score on the Adaptive Defense factor increases by 1.051 points. To reword
this in terms of standardized coefficients, with every increase of one standard deviation in the participants' scores in the Intuition direction, their scores on the Adaptive Defense Factor increases by .265 standard deviations.

Both the Durbin-Watson index (2.139) and the residual scatterplot (Figure 13) show that the regression assumption of normality of residuals was met. The examination of the impact of outliers (through: Cook’s distance, leverage, Mahalanobis distances, DFBeta, DFFit, and covariance ratio) showed that none of the 7 extreme cases (i.e., falling beyond ± 2 standard deviations) had any undue effect on the regression model.

In summary, the results of the regression analyses performed on the three Defense Factors/Styles, as outcome variables, show that the main effects (explanatory power) of the models that included the psychological type predictors were at least twice the magnitude of the main effects revealed by models including only the demographic predictors. More detailed interpretations of these results are included in Chapter 5,
Interpretation of Results and Discussion. The results of all the regression analyses are summarized in Appendix VII. For the purpose of this summary, it can be concluded that the additional consideration or knowledge of psychological typology significantly increases the researcher's or clinician's ability to explain and predict defense style scores.

The second specific research question: Are type dimensions associated with individual defense mechanisms?

Specific Hypotheses

Based on the definitions and the operationalization of types and defenses it was hypothesized that Extroversion would be positively correlated with Affiliation and negatively correlated with Withdrawal and Inhibition. As the extraverts' attention tends to focus on objects and people in the environment, and as they seem to be characterized by frankness, ease of communication and sociability (Jung, 1921/1971; Myers, et al., 1998), it is more likely that they will deal with emotional conflict by turning to others for help and support, or sharing problems with others (American Psychiatric Association, 1994).

On the Sensing – Intuiting bipolar continuum, it was expected that Intuition would be associated with such defenses as Anticipation and Fantasy. The intuitive individuals' propensity to focus on future possibilities and consequences, as well as their concern with meanings, relationships, and patterns (Myers, et al., 1998) can make them quite likely to deal with emotional conflict or internal or external stressors by anticipating consequences of future events and considering alternative responses or solutions (American Psychiatric Association, 1994). At the same time, unlike the sensing types, the
intuitive types may resort more to daydreaming as a substitute for direct involvement, more effective action, or concrete problem solving.

*Isolation of Affect, Task Orientation, and Suppression* are defense strategies that are more likely to be displayed by the thinking types within the *Thinking – Feeling* continuum. Given their tendency to make decisions by ordering choices in terms of logical cause-effect and objective analysis of relevant information (Myers, et al., 1998), the thinking types may deal with emotional conflict by making use (sometimes excessive) of abstract thinking or rational justifications in order to control or minimize disturbing feelings. Similarly, they may tend to lose touch with the feelings associated with a given idea (e.g., traumatic event) while remaining aware of the cognitive elements of it (e.g., descriptive details). The thinking types may also tend to alleviate emotional conflict by intentionally avoiding thinking about disturbing wishes, feelings or experiences (American Psychiatric Association, 1994).

Finally, within the *Judging – Perceiving* continuum, the defensive adaptive strategy of *Anticipation* was hypothesized to be associated with higher scores on the *Judging* orientation. The judging type is described as organized and interested in planning and following schedules (Myers, et al., 1998).

*Analyses and Results*

As with the previous analysis of defense styles, the analysis involving defense mechanisms as outcome variables started with a preliminary examination of the relationship between the independent (outcome) variables and the demographic variables. This was done in order to evaluate the hypothesized increase in the predictive ability of models that included the additional psychological type variables. First, the pattern of
zero-order correlations between defense mechanisms and demographic variables was examined. Table 18 below shows the results of that bivariate correlation analysis.

<table>
<thead>
<tr>
<th></th>
<th>Age</th>
<th>Education</th>
<th>Gender</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acting-Out</td>
<td>-.223**</td>
<td>-.080</td>
<td>-.082</td>
</tr>
<tr>
<td>Consumption</td>
<td>-.045</td>
<td>-.022</td>
<td>.102</td>
</tr>
<tr>
<td>Denial</td>
<td>-.159*</td>
<td>-.215**</td>
<td>-.246**</td>
</tr>
<tr>
<td>Fantasy</td>
<td>-.243**</td>
<td>-.110</td>
<td>.012</td>
</tr>
<tr>
<td>Hypochondriasis</td>
<td>-.354**</td>
<td>-.200**</td>
<td>-.159*</td>
</tr>
<tr>
<td>Inhibition</td>
<td>-.189**</td>
<td>-.197**</td>
<td>.017</td>
</tr>
<tr>
<td>Passive Aggression</td>
<td>-.239**</td>
<td>-.068</td>
<td>-.204**</td>
</tr>
<tr>
<td>Projection</td>
<td>-.281**</td>
<td>-.166*</td>
<td>-.213**</td>
</tr>
<tr>
<td>Regression</td>
<td>-.168*</td>
<td>-.128</td>
<td>-.004</td>
</tr>
<tr>
<td>Somatization</td>
<td>-.197**</td>
<td>-.017</td>
<td>.060</td>
</tr>
<tr>
<td>Undoing</td>
<td>-.192**</td>
<td>-.098</td>
<td>.012</td>
</tr>
<tr>
<td>Withdrawal</td>
<td>-.019</td>
<td>-.005</td>
<td>.063</td>
</tr>
<tr>
<td>Isolation of Affect</td>
<td>-.172*</td>
<td>-.145*</td>
<td>-.345**</td>
</tr>
<tr>
<td>Omnipotence-Devaluation</td>
<td>-.279**</td>
<td>-.061</td>
<td>-.273**</td>
</tr>
<tr>
<td>Idealization</td>
<td>.009</td>
<td>-.127</td>
<td>.191**</td>
</tr>
<tr>
<td>Splitting</td>
<td>-.172*</td>
<td>-.326**</td>
<td>-.162*</td>
</tr>
<tr>
<td>Pseudo-Altruism</td>
<td>.066</td>
<td>-.023</td>
<td>.138*</td>
</tr>
<tr>
<td>Reaction Formation</td>
<td>.060</td>
<td>-.046</td>
<td>.052</td>
</tr>
<tr>
<td>Affiliation</td>
<td>-.117</td>
<td>-.024</td>
<td>.122</td>
</tr>
<tr>
<td>Anticipation</td>
<td>.018</td>
<td>.178**</td>
<td>.165*</td>
</tr>
<tr>
<td>Humour</td>
<td>.027</td>
<td>.082</td>
<td>.042</td>
</tr>
<tr>
<td>Sublimation</td>
<td>.063</td>
<td>.046</td>
<td>.136*</td>
</tr>
<tr>
<td>Suppression</td>
<td>.094</td>
<td>.052</td>
<td>-.070</td>
</tr>
<tr>
<td>Task Orientation</td>
<td>.063</td>
<td>-.002</td>
<td>.060</td>
</tr>
</tbody>
</table>

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).
These results suggest that a large number of maladaptive and neurotic defense mechanisms are negatively correlated with Age and Education, at a statistically significant level. No statistically significant correlations were revealed between the adaptive defenses of Humour, Sublimation, Suppression and Task Orientation and the demographic variables Age and Education. On the other hand, higher scores on such defenses as Passive Aggression, Projection, Isolation of Affect, or Omnipotence-Devaluation were found to be positively correlated with males, while higher scores on Idealization, Pseudo-Altruism, Anticipation, or Sublimation were found to be positively correlated with females.

The pattern of zero-order correlations between individual defenses and type dimensions was also examined. Table 19 below shows the results of that analysis.

<table>
<thead>
<tr>
<th></th>
<th>E – I</th>
<th>S – N</th>
<th>T – F</th>
<th>J – P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acting-Out</td>
<td>-.129</td>
<td>.072</td>
<td>.039</td>
<td>-.096</td>
</tr>
<tr>
<td>Consumption</td>
<td>.034</td>
<td>-.034</td>
<td>-.168*</td>
<td>-.075</td>
</tr>
<tr>
<td>Denial</td>
<td>.045</td>
<td>.141*</td>
<td>.166*</td>
<td>-.013</td>
</tr>
<tr>
<td>Fantasy</td>
<td>-.092</td>
<td>-.106</td>
<td>-.092</td>
<td>-.219**</td>
</tr>
<tr>
<td>Hypochondriasis</td>
<td>-.137*</td>
<td>.199**</td>
<td>.115</td>
<td>.021</td>
</tr>
<tr>
<td>Inhibition</td>
<td>-.453**</td>
<td>.255**</td>
<td>-.023</td>
<td>.181**</td>
</tr>
<tr>
<td>Passive Aggression</td>
<td>-.142*</td>
<td>.002</td>
<td>.042</td>
<td>-.098</td>
</tr>
<tr>
<td>Projection</td>
<td>-.242**</td>
<td>.336**</td>
<td>.184**</td>
<td>.102</td>
</tr>
<tr>
<td>Regression</td>
<td>-.075</td>
<td>.121</td>
<td>-.122</td>
<td>.034</td>
</tr>
<tr>
<td>Somatization</td>
<td>-.159*</td>
<td>.129</td>
<td>-.029</td>
<td>.100</td>
</tr>
<tr>
<td>Undoing</td>
<td>-.185**</td>
<td>.151*</td>
<td>-.065</td>
<td>.044</td>
</tr>
<tr>
<td>Withdrawal</td>
<td>-.209*</td>
<td>-.038</td>
<td>-.049</td>
<td>.078</td>
</tr>
<tr>
<td>Isolation of Affect</td>
<td>-.344**</td>
<td>.262**</td>
<td>.312**</td>
<td>.103</td>
</tr>
</tbody>
</table>
As far as individual type dimensions are concerned, these results indicate that certain defenses seem to be associated with one or the other pole of a bipolar MBTI dimension. For example, the adaptive defense mechanism of humour appears to be associated with extraversion, intuition, feeling, and perceiving. Similarly, people who score in the intuition direction on the Sensing – Intuition continuum are less likely than their sensing counterparts to adopt such ego defense mechanisms as inhibition, projection, or splitting, in their attempt to protect themselves in a situation of perceived internal or external threat.

As with the analyses of defense styles, a series of hierarchical multiple regression analyses were performed in order to assess the individual and collective contributions of all predictors (psychological types and demographic variables) to the explanation of variance in the participants' scores on defense mechanisms. The procedure followed the recommendations by Aiken and West (1991), as well as Lubinski and Humphreys (1990). Seven predictors (4 type dimensions and 3 demographic indicators) were entered
stepwise in the first block of the analysis, followed by a stepwise entry of the interaction and squared terms in the second block. Thus, as was the case with the analysis of Defense Factors/Styles, attention was paid to suppression and moderator effects in the relationship between predictors and outcome (i.e., individual defense mechanisms). As described in detail under the previous section on Defense Factors/Styles, all of the regression analysis results presented below were checked for multicollinearity indices, distribution of residuals, and impact of extreme cases (i.e., outlier scores falling beyond 2 standard deviations from the mean of the outcome variable).

Due to the extreme unreliability of the Consumption subscale (Cronbach alpha = .096) (see Table 20 in Appendix IV), this defense mechanism was not included among the following multiple regression analyses.

The best-specified model for the defense mechanism of Acting Out included Age as the only valid predictor, which explained 5% of the variance in the participants' scores on that defense mechanisms. Using Wherry's equation, the Adjusted $R^2 = .045$; using Stein's formula, the Adjusted $R^2 = .036$. The main effect of Age on the outcome variable Acting Out amounted to $F = 10.701$ (1, 204), which was statistically significant at $p = .001$. That model can be expressed as:

$$\text{Acting Out} = 5.003 + (-.026 \text{ Age})$$ (8)

Extraversion – Introversion and Judging – Perceiving brought about an increase in the multiple correlation coefficient, which, in both cases, was statistically significant at $p < .05$. However, the examination of the relative magnitude of the zero-order correlation coefficient and the semipartial correlation coefficient revealed a suppression situation. Therefore, the model including the E-I and J-P predictors was rejected.
The best-specified model for the defense mechanism of *Denial* included *Education, Gender,* and the polynomial term *T-F*\(^2\) as valid predictors, which explained 12% of the variance in the participants’ scores on that defense mechanisms. Using Wherry’s equation, the *Adjusted \(R^2\) = .107;* using Stein’s formula, the *Adjusted \(R^2\) = .085.* The main effects of *Education, Gender,* and *T-F*\(^2\) on the outcome variable *Denial* amounted to *\(F = 9.170 (3, 202),\) which was statistically significant at \(p < .001.\) That model can be expressed as:

\[
\text{Denial} = 4.026 + (-1.371 \text{ Education}) + (-.378 \text{ Gender}) + (.798 \text{ T-F*}^2) \tag{9}
\]

The best-specified model for the defense mechanism of *Fantasy* included *Age* as the only valid predictor, which explained 5.9% of the variance in the participants’ scores on that defense mechanisms. Using Wherry’s equation, the *Adjusted \(R^2\) = .054;* using Stein’s formula, the *Adjusted \(R^2\) = .045.* The main effect of the *Age* predictor on the outcome variable *Fantasy* was *\(F = 12.780 (1, 204),\) which was statistically significant at \(p < .001.\) That model can be expressed as:

\[
\text{Fantasy} = 5.798 + (-.049 \text{ Age}) \tag{10}
\]

Two additional predictors, *Judging – Perceiving* and  *Extraversion – Introversion,* showed a statistically significant negative relationship with Fantasy, but their presence revealed a suppression situation. Therefore, the three-predictor model was rejected.

The best-specified model for the defense mechanism of *Hypochondriasis* included *Age, Sensing – Intuiting,* and *Extraversion – Introversion* as valid predictors, which explained 16.8% of the variance in the participants’ scores on that defense mechanisms. Using Wherry’s equation, the *Adjusted \(R^2\) = .156;* using Stein’s formula, the *Adjusted \(R^2\) = .131.* The main effects of the predictors *Age, Sensing – Intuiting,* and *Extraversion –*
Introversion on the outcome variable Hypochondriasis was $F = 13.6$ (3, 202), which was statistically significant at $p < .001$. That model can be expressed as:

$$\text{Hypochondriasis} = 5.356 + (-.054 \text{ Age}) + (.992 \text{ SN}) + (-.936 \text{ EI})$$ \hspace{1cm} (11)

The best-specified model for the defense mechanism of Inhibition included Extraversion – Introversion as the only valid predictor, which explained 20.5% of the variance in the participants' scores on that defense mechanisms. Using Wherry’s equation, the $Adjusted R^2 = .202$; using Stein’s formula, the $Adjusted R^2 = .193$. The main effect of the Extraversion – Introversion dimension on the outcome variable Inhibition was $F = 52.751$ (1, 204), which was statistically significant at $p < .001$. That model can be expressed as:

$$\text{Inhibition} = 5.590 + (-2.871 \text{ EI})$$ \hspace{1cm} (12)

A number of other potential contributors to the explanation of variance in participants' scores on Inhibition, namely Education (negative relationship), Sensing – Intuiting (positive relationship), Thinking – Feeling (negative), and Age (negative) were, in the end, rejected from the model because they acted as suppressors.

The best-specified model for the defense mechanism of Passive-Aggression included Age, Gender, and the interaction term EI*JP, as valid predictors, which explained 12.3% of the variance in the participants' scores on that defense mechanisms. Using Wherry's equation, the $Adjusted R^2 = .110$; using Stein’s formula, the $Adjusted R^2 = .092$. The main effects of the Age, Gender, and EI*JP on the outcome variable Passive-Aggression was $F = 9.444$ (3, 202), which was statistically significant at $p < .001$. That model can be expressed as:
Passive-Agression = 5.347 + (-.024 Age) + (-.351 Gender) +
+ (-1.219 EI*JP)  \hspace{1cm} (13)

The best-specified model for the defense mechanism of Projection included Sensing – Intuiting, Age, Extraversion – Introversion, and Gender as valid predictors, which explained 23.7% of the variance in the participants’ scores on that defense mechanisms. Using Wherry’s equation, the Adjusted $R^2 = .222$; using Stein’s formula, the Adjusted $R^2 = .202$. The main effects of Sensing – Intuiting, Age, Extraversion – Introversion and Gender on the outcome variable Projection was $F = 15.644 \ (4, \ 201)$, which was statistically significant at $p < .001$. That model can be expressed as:

Projection = 3.698 + (1.105 SN) + (-.022 Age) + (-.790 EI) +
+ (-.317 Gender)  \hspace{1cm} (14)

The best-specified model for the defense mechanism of Regression included Age as the only valid predictor, which explained 2.8% of the variance in the participants’ scores on that defense mechanisms. Using Wherry’s equation, the Adjusted $R^2 = .023$; using Stein’s formula, the Adjusted $R^2 = .013$. The main effect of the Age predictor on the outcome variable Regression was $F = 5.931 \ (1, \ 204)$, which was statistically significant at $p < .016$. That model can be expressed as:

Regression = 4.658 + (-.029 Age)  \hspace{1cm} (15)

Two additional predictors, Thinking - Feeling (negative relationship) and Sensing – Intuiting (positive relationship), were rejected from the model as their presence revealed a suppression situation.

The best-specified model for the defense mechanism of Somatization included Age as the only valid predictor, which explained 3.9% of the variance in the participants’ scores on that defense mechanisms. Using Wherry’s equation, the Adjusted $R^2 = .034$;
using Stein’s formula, the $Adjusted R^2 = .025$. The main effect of the Age predictor on the outcome variable Somatization was $F = 8.199 (1, 204)$, which was statistically significant at $p < .005$. That model can be expressed as:

$$\text{Somatization} = 5.287 + (-.034 \text{ Age})$$  \hspace{1cm} (16)

Suppression effects were detected in the presence of Extraversion – Introversion (negative relationship) and the interaction term E-I by Age. Hence, these predictors were omitted from the final model.

The best-specified model for the defense mechanism of Undoing included Age as the only valid predictor, which explained 3.7% of the variance in the participants’ scores on that defense mechanisms. Using Wherry’s equation, the $Adjusted R^2 = .032$; using Stein’s formula, the $Adjusted R^2 = .022$. The main effect of the Age predictor on the outcome variable Undoing was $F = 7.775 (1, 204)$, which was statistically significant at $p = .006$. That model can be expressed as:

$$\text{Undoing} = 4.275 + (-.024 \text{ Age})$$  \hspace{1cm} (17)

Suppression effects were detected with the inclusion of Extraversion – Introversion (negative relation), Sensing – Intuiting (positive relation), and Thinking – Feeling (negative relation). Hence, they were omitted from the final model.

The best-specified model for the defense mechanism of Withdrawal included the Extraversion – Introversion dimension as the only valid predictor, which explained 4.4% of the variance in the participants’ scores on that defense mechanisms. Using Wherry’s equation, the $Adjusted R^2 = .039$; using Stein’s formula, the $Adjusted R^2 = .029$. The main effect of the Extraversion – Introversion predictor on the outcome variable Withdrawal
was $F = 9.362 \ (1, 204)$, which was statistically significant at $p = .003$. That model can be expressed as:

$$\text{Withdrawal} = 6.867 + (-1.359 \ EI)$$  \hspace{1cm} (18)

The best-specified model for the defense mechanism of *Isolation of Affect* included *Gender, Extraversion – Introversion, Sensing – Intuiting*, and *Age* as valid predictors, which explained 26.7% of the variance in the participants’ scores on that defense mechanisms. Using Wherry’s equation, the $\text{Adjusted } R^2 = .252$; using Stein’s formula, the $\text{Adjusted } R^2 = .234$. The main effects of *Gender, Extraversion – Introversion, Sensing – Intuiting*, and *Age* on the outcome variable *Isolation of Affect* was reflected by $F = 18.293 \ (4, 201)$, which was statistically significant at $p < .001$. That model can be expressed as:

$$\text{Isolation of Affect} = 5.725 + (-.891 \ Gender) + (-1.705 \ EI) +$$
$$+ (1.127 \ SN) + (-.017 \ Age)$$  \hspace{1cm} (19)

The best-specified model for the defense mechanism of *Omnipotence-Devaluation* included *Age, Thinking – Feeling*, and *Gender*, as valid predictors, which explained 17% of the variance in the participants’ scores on that defense mechanisms. Using Wherry’s equation, the $\text{Adjusted } R^2 = .158$; using Stein’s formula, the $\text{Adjusted } R^2 = .141$. The main effects of *Age, Thinking – Feeling*, and *Gender* on the outcome variable *Omnipotence-Devaluation* amounted to $F = 13.793 \ (3, 202)$, which was statistically significant at $p < .001$. That model can be expressed as:

$$\text{Omnipotence-Devaluation} = 4.531 + (-.027 \ Age) + (1.013 \ TF) +$$
$$+ (-.517 \ Gender)$$  \hspace{1cm} (20)

The moderator effects reflected in the interaction terms *S-N by Education, T-F by Education*, and *S-N by Gender* were found to be spurious, due to presence of a
suppression situation. Thus, the interaction terms were excluded from the final model for this defense mechanism.

The best-specified model for the defense mechanism of *Idealization* included the *Gender* variable as the only valid predictor, which explained 3.7% of the variance in the participants' scores on that defense mechanisms. Using Wherry's equation, the *Adjusted $R^2 = .032$*; using Stein's formula, the *Adjusted $R^2 = .023$*. The main effect of the *Gender* predictor on the outcome variable *Idealization* was $F = 9.362$ (1, 204), which was statistically significant at $p = .006$. That model can be expressed as:

$$\text{Idealization} = 2.546 + (.853 \text{ Gender})$$ (21)

The variable *Education* (negative relationship) increased somewhat the explanatory power of the regression equation but it introduced a suppression effect. Therefore, *Education* was excluded as a valid predictor from the model predicting the participants’ scores on *Idealization*.

The best-specified model for the defense mechanism of *Splitting* included the typological dimension *Sensing – Intuiting*, and the demographic variables *Education*, and *Gender*, as valid predictors. Together they explained 22.4% of the variance in the participants’ scores on that defense mechanisms. Using Wherry’s equation, the *Adjusted $R^2 = .213$*; using Stein’s formula, the *Adjusted $R^2 = .197$*. The main effects of *Sensing – Intuiting*, *Education*, and *Gender* on the outcome variable *Splitting* amounted to $F = 19.441$ (3, 202), which was statistically significant at $p < .001$. That model can be expressed as:

$$\text{Splitting} = 3.736 + (1.928 \text{ SN}) + (-1.746 \text{ Education}) + (-.407 \text{ Gender})$$ (22)
The best-specified model for the defense mechanism of *Pseudo-Altruism* included the type variable *Thinking - Feeling* as the only valid predictor, which explained 5.6% of the variance in the participants’ scores on that defense mechanisms. Using Wherry’s equation, the $Adjusted R^2 = .051$; using Stein’s formula, the $Adjusted R^2 = .042$. The main effect of the *Thinking - Feeling* predictor on the outcome variable *Pseudo-Altruism* was $F = 12.017$ (1, 204), which was statistically significant at $p = .001$. That model can be expressed as:

$$Pseudo-Altruism = 7.001 + (-1.900 \text{ TF})$$  \hspace{1cm} (23)

*Thinking - Feeling* was again the only predictor retained in the best-specified model for the defense mechanism of *Reaction Formation*. *T-F* explained 1.9% of the variance in participants’ scores on this defense mechanism. Using Wherry’s equation, the $Adjusted R^2 = .015$; using Stein’s formula, the $Adjusted R^2 = .004$. The main effect of the *Thinking - Feeling* predictor on the outcome variable *Reaction Formation* was $F = 4.037$ (1, 204), which was statistically significant at $p = .046$. That model can be expressed as:

$$Reaction \text{ Formation} = 4.744 + (-.721 \text{ TF})$$  \hspace{1cm} (24)

*Thinking - Feeling* was again the only predictor retained in the best-specified model for the defense mechanism of *Affiliation*. *T-F* explained 2.8% of the variance in participants’ scores on this defense mechanism. Using Wherry’s equation, the $Adjusted R^2 = .024$; using Stein’s formula, the $Adjusted R^2 = .013$. The main effect of the *Thinking - Feeling* predictor on the outcome variable *Affiliation* was $F = 5.982$ (1, 204), which was statistically significant at $p = .015$. That model can be expressed as:

$$Affiliation = 5.764 + (-1.264 \text{ TF})$$  \hspace{1cm} (25)
Age (negative relation) contributed .019 points to the $R^2$ change, and this value was statistically significant at $p = .047$, but the inclusion of this variable created a suppression effect. As such, the role played by the variable Age was ignored from the final model.

The best-specified model for the defense mechanism of Anticipation included the type variable Judging – Perceiving as the only valid predictor, which explained 4.2% of the variance in the participants’ scores on that defense mechanism. Using Wherry’s equation, the Adjusted $R^2 = .037$; using Stein’s formula, the Adjusted $R^2 = .028$. The main effect of the Judging – Perceiving predictor on the outcome variable Anticipation was $F = 8.982$ (1, 204), which was statistically significant at $p = .003$. That model can be expressed as:

$$\text{Anticipation} = 5.157 + (1.212 \text{ JP}) \quad (26)$$

The presence of Sensing – Intuiting (negative relation), Gender (positive relation) and the interaction term Sensing – Intuiting by Gender (positive relation) created a suppression situation and, as such, these additional predictors were excluded from the final explanatory model for Anticipation.

The best-specified model for the defense mechanism of Humour included the type dimensions Judging – Perceiving, Sensing – Intuiting, and Extraversion - Introversion, as valid predictors, which explained 18% of the variance in the participants’ scores on that defense mechanism. Using Wherry’s equation, the Adjusted $R^2 = .168$; using Stein’s formula, the Adjusted $R^2 = .151$. The main effects of Judging – Perceiving, Sensing – Intuiting, and Extraversion - Introversion on the outcome variable Humour amounted to $F = 14.828$ (3, 202), which was statistically significant at $p < .001$. That model can be expressed as:
Humour = 5.998 + (-1.279 JP) + (-1.120 SN) + (.737 EI) \hspace{1cm} (27)

The best-specified model for the defense mechanism of Sublimation included the type variable Sensing - Intuiting as the only valid predictor, which explained 5.7% of the variance in the participants' scores on that defense mechanisms. Using Wherry's equation, the Adjusted $R^2 = .052$; using Stein's formula, the Adjusted $R^2 = .043$. The main effect of the Sensing - Intuiting predictor on the outcome variable Sublimation was $F = 12.314 \ (1, \ 204)$, which was statistically significant at $p = .001$. That model can be expressed as:

Sublimation = 6.026 + (-2.132 SN) \hspace{1cm} (28)

The best-specified model for the defense mechanism of Suppression included the interaction term Sensing - Intuiting by Gender as the only valid predictor, which explained 2.9% of the variance in the participants' scores on that defense mechanisms. Using Wherry's equation, the Adjusted $R^2 = .024$; using Stein's formula, the Adjusted $R^2 = .014$. The main effect of the Sensing - Intuiting by Gender predictor on the outcome variable Suppression was $F = 6.015 \ (1, \ 204)$, which was statistically significant at $p = .015$. That model can be expressed as:

Suppression = 5.732 + (-.633 SN*Gender) \hspace{1cm} (29)

The negative sign of the regression coefficient for this interaction term means that higher scores on Suppression are associated with males' higher scores on Intuition. The presence of an additional predictor, the interaction term Thinking - Feeling by Age (positive relation) created a statistical effect of suppression, which led to the exclusion of that interaction term from the final model for explaining the variance in the defense
mechanism of *Suppression* (excuse the unfortunate homonymy between these technical terms).

Finally, the best-specified model for the defense mechanism of *Task Orientation* included the interaction term *Thinking – Feeling by Gender* as the only valid predictor, which explained 1.9% of the variance in the participants’ scores on that defense mechanism. Using Wherry’s equation, the \( Adjusted R^2 = .014 \); using Stein’s formula, the \( Adjusted R^2 = .004 \). The main effect of the *Thinking – Feeling by Gender* predictor on the outcome variable *Task Orientation* was \( F = 3.891 \) (1, 204), which was statistically significant at \( p = .05 \). That model can be expressed as:

\[
\text{Task Orientation} = 5.949 + (.499 \ TC*Gender)
\]

The positive sign of the regression coefficient for this interaction term means that higher scores on *Task Orientation* are associated with females’ higher scores on *Thinking*.

In summary, the results of the regression analyses performed on 23 Ego Defense Mechanisms, considered as outcome variables, show that, for some defense mechanisms, the addition of psychological type predictors over basic demographic variables significantly increases the explanatory and predictive power of those models. This was the case for: *Hypochondriasis, Inhibition, Isolation of Affect, Projection, Splitting, Pseudo-Altruism, Humour, Sublimation, and Suppression*. More detailed interpretations of these results are included in Chapter 5, *Interpretation of Results and Discussion*. The results of all the regression analyses are summarized in Appendix VII. For the purpose of this summary, it can be concluded that the additional consideration or knowledge of psychological typology significantly increases the researcher’s or clinician’s ability to explain and predict certain defense mechanism scores.
Further Investigation of Gender Differences

As mentioned earlier in the overview to the section entitled Analysis and Results, the exploration of the role played by the demographic variables Age, Education, and Gender was carried out both separately and in combination with the four psychological type variables. Of the three demographic variables used as predictors in the multiple regression analyses described above, Gender is the only categorical variable and, as such, it lends itself to a different kind of research question. This research question can be formulated as follows: Are the regression models identified above stable across genders, or are there gender differences in the way in which the remaining predictors explain the participants' scores on defense factors? This question is different from the research questions addressed above, in that the Gender variable is no longer included as a potential predictor in the regression analysis, as it constitutes the differentiating characteristic between the two independent samples. This research question was addressed by splitting the file into two separate groups by gender and repeating the hierarchical multiple regression analysis for each defense style and each gender.

The statistical procedure followed the same principles outlined by Aiken and West (1991) and Lubinski and Humphreys (1990), namely hierarchical multiple regression, with 4 psychological type variables and 2 demographic predictors (Age and Education) entered stepwise in the first block, and interaction and squared terms (excluding Gender, of course) entered stepwise in the second block.

Equations (31) and (32) represent, the best-specified regression models for the Maladaptive Defense Style.
Female Maladaptive Style = 4.073 + (.943 SN) + (-.024 Age) + 
+ (-1.042 EI)  \hfill (31)

This model explained 31\% of the variance in female participants’ scores on Maladaptive Defenses, and the main effects of Sensing – Intuiting, Age, and Extraversion – Introversion amounted to $F = 16.768$ (3, 112), which was statistically significant at $p < .001$. Using Wherry’s equation, the Adjusted $R^2 = .291$; using Stein’s formula, the $Adjusted R^2 = .286$.

Male Maladaptive Style = 4.554 + (-.035 Age) + (1.319 SN) + 
+ (-.903 EI) \hfill (32)

This model explained 30.8\% of the variance in male participants’ scores on Maladaptive Defenses, and the main effects of Age, Sensing – Intuiting, and Extraversion – Introversion amounted to $F = 12.768$ (3, 86), which was statistically significant at $p < .001$. Using either Wherry’s equation or Stein’s formula, the Adjusted $R^2 = .284$.

No model was generated for the Female Neurotic Style that would be statistically significant at $p < .05$. In other words, none of the predictors in this study made any statistically significant contribution to the explanation of variance in the female participants’ scores on the Neurotic Defense Factor. However, if the type dimension Thinking – Feeling was to be forced-entered into a simple regression model, that equation could be expressed as:

\[
\text{Female Neurotic Style} = 4.979 + (-.013 \text{ TF}) \hfill (33)
\]

This model explained 2.9\% of the variance in female participants’ scores on Neurotic Defenses, and the main effects of the Thinking – Feeling dimension amounted to $F = 3.343$ (1, 114), but was statistically significant only at $p = .070$. Using Wherry’s equation, the Adjusted $R^2 = .020$; using Stein’s formula, the Adjusted $R^2 = .014$. 
Male Neurotic Style $= 5.256 + (-1.137 \, TF)$ \hspace{1cm} (34)

This model explained 10.3\% of the variance in male participants’ scores on Neurotic Defenses, and the main effects of the Thinking – Felling dimension amounted to $F = 10.133 \, (1, \, 88)$, which was statistically significant at $p = .002$. Using Wherry’s equation, the $Adjusted \, R^2 = .093$; using Stein’s formula, the $Adjusted \, R^2 = .090$.

Female Adaptive Style $= 5.813 + (-.912 \, SN) + (.017 \, Age)$ \hspace{1cm} (35)

This model explained 10.3\% of the variance in female participants’ scores on Adaptive Defenses, and the main effects of Sensing – Intuiting and Age amounted to $F = 6.476 \, (2, \, 113)$, which was statistically significant at $p < .002$. Using Wherry’s equation, the $Adjusted \, R^2 = .087$; using Stein’s formula, the $Adjusted \, R^2 = .081$.

Male Adaptive Style $= 6.246 + (-1.001 \, SN)$ \hspace{1cm} (36)

This model explained 6.9\% of the variance in male participants’ scores on Adaptive Defenses, and the main effect of the Sensing – Intuiting dimension amounted to $F = 6.475 \, (1, \, 88)$, which was statistically significant at $p = .013$. Using Wherry’s equation, the $Adjusted \, R^2 = .058$; using Stein’s formula, the $Adjusted \, R^2 = .055$.

This analysis of gender differences indicates that the general model for the Maladaptive Defense Style (males and females combined) is a robust model, in that the specified predictors Age, Extraversion – Introversion, and Sensing – Intuiting make a significant contribution to the explanation of the variance in the scores of both male and female participants. In addition, this analysis indicates that the identified contribution of the Thinking – Felling variable in the explanation of variance in the Neurotic Style scores is only statistically significant for males and not for females (as long as one wants to maintain a 95% confidence interval about this statement). Finally, this analysis of gender
differences also indicates that the *Sensing – Intuiting* dimension is a statistically significant contributor to both males' and females' scores on the *Adaptive Defense Factor*, while *Age* is an additional contributor to the explanation of those same scores for females only.

The investigation of gender differences continued with the analysis of individual defense mechanisms following the same procedure as in the case of the analysis of defense styles. Hierarchical stepwise multiple regression analyses were performed for each defense mechanism and for each gender separately. Those results are included in Table 22 of Appendix VII, *Summary of Results*. For many defense mechanisms, the models generated for the separate samples based on gender confirmed the findings obtained for the total sample (males and females combined). That was the case with: *Acting-Out, Denial, Passive Aggression, Somatization, Withdrawal, Idealization, Splitting*, and *Pseudo-Altruism*. In other cases, the gender-differentiated models included one more predictor over the general model (-JP was added to the male *Fantasy* model, - *Age* to male *Inhibition*, +EI to female *Denial*, and -*Education* to female *Inhibition*), or dropped a predictor from the general model (both male and female *Hypochondriasis* models dropped the *Sensing – Intuiting* dimension, male *Projection* dropped *Sensing – Intuiting* and *Age*, female *Isolation of Affect* dropped *Sensing – Intuiting*, male *Omnipotence-Devaluation* dropped the *Thinking – Feeling* dimension, while female *Omnipotence-Devaluation* dropped the *Age* predictor, female *Reaction Formation* dropped the *Thinking – Feeling* dimension, as did male *Affiliation*, male *Humour* dropped the *Extraversion – Introversion* dimension, while female *Humour* dropped the *Sensing –
Intuiting dimension, and, finally, female Sublimation dropped the Sensing - Intuiting dimension).

With a few individual defense mechanisms, however, the models differed substantially between the two genders and from the general model. For example, the general model for Regression identified Age as the only valid predictor of the participants’ scores on that defense scale. When males’ scores were analyzed separately, the Thinking - Feeling dimension emerged as the only predictor of male Regression scores (with higher scores on Regression associated with the Feeling function), while Education was the only predictor for the female sample (with higher Regression scores associated with lower levels of Education). The interpretations of these gender differences are included under the section entitled Interpretation of Results and Discussion.

Correlates of Social Desirability

The Social Desirability Scale included in the Defense Style Questionnaire was not designed as a measure of a particular defense mechanism (Bond, 1991), but, most likely, as an additional check for the detection of possible response bias. This is the most general statement that could be made about the Social Desirability Scale, based on its face validity, as the author did not include any specific directions or comments on its purpose or interpretation in the manual. For descriptive purposes, some of the psychometric properties of the Social Desirability Scale were presented earlier in the section entitled Study 1. The exploratory factor analysis performed on the 10 items making up the scale clearly identified two factors, which is consistent with the results obtained on other social desirability scales reported in the literature (Paulhus, 1984). The degree to which either
one or both of the two factors identified are related to the global concept of “defensiveness” was considered important for this study in light of the implications for research and clinical practice. In other words, the relationship between participants’ scores on the Social Desirability Scale and other variables in this study, including scores on three defense styles, may contribute to a better understanding of the function of this scale as a global index of defensiveness.

A preliminary bivariate correlation analysis between the Social Desirability Scale (SDS) and other variables of interest in this study (i.e., the 4 psychological type dimensions, the 3 demographic variables, and the 3 defense styles) identified only one modest positive correlation between the Neurotic Defense Style and the SDS, \( r = .174 \), which was statistically significant at \( p < .05 \). Remembering that the SDS includes only negatively keyed items, this result means that, as the participants’ scores on the Neurotic Defense Style increase, the likelihood of deceptive reporting decreases. This result was confirmed through a hierarchical stepwise multiple regression analysis, which revealed the following relationship, as the best-specified model for explaining the variance in SDS scores:

\[
\text{SDS} = 5.509 + (.198 \text{ Neurotic Style})
\]

(37)

This model explained 3% of the variance in SDS scores (\( Adjusted R^2 = .026, F = 6.405 \) \[1, 204\], \( p = .012 \)).

The multiple regression analysis was repeated for each of the two factors of the SDS, and those models were quite different from each other. The analysis of the first factor of the SDS, represented by the Self-Deception subscale, generated the following regression model:
Self-Deception \( = 3.987 + (.392 \text{ Neurotic Style}) \) (38)

which means that the higher the participants' scores are on the Neurotic Defense Factor, the lower their likelihood to report using self-deception. This model explained 4.2% of the variance in the participants' scores on the Self-Deception subscale \( (\text{Adjusted } R^2 = .037, F = 8.867 [1, 204], p = .003) \)

For the second factor, the Impression Management subscale (or Other-Deception), the well-specified regression model was:

Impression Management \( = 7.988 + (-.020 \text{ Age}) + (-.475 \text{ Gender}) \) (39)

This model explained 9.5% of the variance in SDS scores \( (\text{Adjusted } R^2 = .086, F = 10.669 [2, 203], p < .001) \). In light of the negatively keyed items forming the Impression Management subscale, equation (39) can be read as: female participants and older participants are more likely to report behaviours intended to make a good impression on others.

The role played by Gender on participants' reporting of socially desirable behaviours was further investigated by performing separate regression analyses for each gender. Of the three pairs of regression analyses performed (i.e., with the SDS, the Self-Deception subscale, and the Impression Management subscale as separate outcomes), no valid model could be generated for any of the three analyses involving female participants. For male participants, the hierarchical multiple regression analysis of their overall SDS scores yielded the following model:

Male SDS \( = 4.722 + (.406 \text{ Neurotic Style}) + (.532 \text{ JP*Education}) \) (40)

whereby higher scores on the Neurotic Defense Factor, as well as the interaction between higher scores on Education and higher scores on the Judging function are associated with
a reduced tendency to report socially desirable behaviours. The model explained 18.5% of the male participants’ scores on the SDS, \( Adjusted R^2 = .166, F = 9.877 [2, 87], p < .001 \).

The analysis of male participants’ responses on the Self-Deception subscale yielded the following model:

\[
\text{Male Self-Deception} = 2.621 + (.698 \text{ Neurotic Style})
\]

whereby male participants’ scores on the Neurotic Defense Factor accounted for 11% of the variance in their scores on the Self-Deception subscale \( Adjusted R^2 = .100, F = 10.927 [1, 88], p = .001 \).

The analysis of the Impression Management subscale for males yielded the following model:

\[
\text{Male Impression Management} = 6.540 + (-.028 \text{ Age}) + (.269 \text{ Neurotic Style})
\]

This model explained 14.4% of the variance in the male participants’ scores on the Impression Management subscale \( Adjusted R^2 = .124, F = 7.295 [2, 87], p = .001 \).

Equation (42) can be read as: younger males and males who score higher on the Neurotic Defense Factor are less likely to report behaviours that would make a good impression on others.

Further interpretations of these results are included in the next chapter entitled Interpretation of Results and Discussion. A summary of the regression results for the Social Desirability Scale is included in Appendix VII, Table 24. For the purpose of this section, it can be pointed out, in conclusion, that the different results obtained for the two social desirability subscales attest to the distinct nature of these two kinds of socially desirable responding. In addition, these results revealed gender differences with respect
to social desirability: while male participants' scores on the Neurotic Style was an important predictor of males' SDS scores, no statistically significant predictor could be identified for female SDS scores.

Summary

As stated in the general hypothesis, the results of the regression analyses performed in Study 2 confirmed that there is a statistically significant relationship between psychological types, as measured by the MBTI, and ego defense mechanisms, as measured by the DSQ. Additional knowledge of participants' psychological type increased (in most cases doubled) the ability of regression models to explain and predict the participants' scores on the defense measure, when compared with model based only on participants' demographic characteristics. Some of the specific hypotheses formulated at the beginning of this study were also confirmed.

Among the significant findings, the Sensing – Intuiting dimension discriminated between the Maladaptive and the Adaptive Defense Styles, with higher Sensing scores being associated with higher scores on the Maladaptive Defenses, such as: Hypochondriasis, Isolation of Affect, Projection, and Splitting. Higher scores on Intuition were associated with higher scores on the Adaptive Defenses, such as: Humour, Sublimation, and Suppression. Introversion was positively associated with the Maladaptive Defense Style, as were the responses of younger participants. The Thinking – Feeling dimension discriminated between lower and higher scores, respectively, on the Neurotic Defense Style. Gender differences were also identified, with males scoring higher on Denial, Isolation of Affect, Omnipotence-Devaluation, and Splitting, as well as
on the Maladaptive Defense Style in general. No clinically significant interaction effects were detected.

A comprehensive table including all the results of the regression analyses performed in Study 2 is included in Appendix VII.
CHAPTER 5:
INTERPRETATION OF RESULTS AND DISCUSSION

Overview

This study has been an investigation of the relationship between psychological types and ego defense mechanisms, as measured by the Myers-Briggs Type Indicator and the Defense Style Questionnaire, respectively. In order to perform the main investigation, a preliminary factor analytical study was conducted on the DSQ, with the purpose of identifying the internal structure of the instrument. In addition, it has been acknowledged that the DSQ is a relatively new measure and, as such, it was deemed important to provide an additional replication of previous research findings.

A number of statistical analyses have been performed and their results depend on the degree of accuracy with which the constructs, represented here as variables, were measured in the first place. The interpretation of results must take into consideration the reliability coefficient of each of the variables involved in any given analysis. The different degrees of reliability demonstrated by the variables in this study could be classified into three categories: high reliability, moderate reliability, and low reliability.

Throughout the following section, statements about results involving highly reliable variables can be taken to represent valid inferences, within the parameters established by the specific confidence intervals (at least 95% for all analyses) and the appropriate values of the Adjusted $R^2$ (for generalizing results of multiple regression analysis). This is the case for the highly reliable demographic variables: Gender, Age, Education, and Language. All psychological type variables, the Maladaptive Defense
Factor, and several individual defense mechanisms (Hypochondriasis, Projection, Omnipotence-Devaluation) also demonstrated high internal consistency coefficients (see Appendix IV).

Conclusions involving low reliability variables must be regarded as tentative at best. A number of individual defense scales in the DSQ demonstrated an internal consistency coefficient below .50 (such as: Denial, Passive Aggression, Regression, Splitting, Undoing, Affiliation, Anticipation, Humour, Suppression, and Task Orientation). As mentioned earlier, due to the extreme unreliability of the Consumption subscale (Cronbach alpha = .096) (see Table 20 in Appendix IV), this defense mechanism was the only one not included among the multiple regression analyses. Finally, no internal consistency coefficient can be calculated for three defense mechanisms that are represented by one item each. Any references made in this section to these defenses must be interpreted as references to the content of those three items:

(1)  *I get satisfaction from helping others and, if this were taken away from me, I would get depressed.* (Pseudo-Altruism)

(40)  *I work more things out in my daydreams than in real life.* (Fantasy)

(5)  *I work out my anxiety through doing something constructive and creative, like painting or woodwork.* (Sublimation)

Generalizing the results obtained in this study beyond the limits of this sample must also be done with caution, namely by selecting the appropriate value of the Adjusted $R^2$. Smaller ‘shrinkage’ occurs when the observed effect size is generalized to the population from which the sample was drawn. Those values are the SPSS default and are calculated based on Wherry’s formula. The more conservative values of effect size given
by the application of Stein's formula (which, in this study, have been calculated by hand) refer to generalizations made to another possible sample drawn from the same population.

The following discussion focuses on interpreting the results of the analyses of reliable defense mechanisms, as well as the analyses involving initial hypotheses. Throughout this chapter, an integrated interpretation of results is provided, drawing from both Study 1 and Study 2. The results of all the regression analyses performed in this study have been summarized in four tables (Tables 22 through 24) included in Appendix VII, Summary of Results. This chapter is organized under five headings: Predicting Defense Styles, Predicting Defense Mechanisms, Comments on the Social Desirability Scale, Clinical Significance and Implications for Counselling, and, finally, Recommendations for Future Research with and on the DSQ.

**Predicting Defense Styles**

The cluster of maladaptive defenses is undoubtedly the most psychometrically robust factor of the DSQ, with an internal consistency coefficient \( \alpha = .91 \). The four predictors identified by the general model, \( \text{Age, Extraversion – Introversion, Sensing – Intuiting} \), and \( \text{Gender} \) are stable and, with the exception of \( \text{Gender} \), of course, they are also part of the gender-differentiated models. The presence of \( \text{Age} \) as a predictor of maladaptive defense scores confirmed the initially formulated hypothesis that defensive organization changes over the life span, with more immature defenses being associated with earlier developmental stages and more adaptive defenses being associated with more mature developmental stages. As such, these results parallel previous findings in other
studies and provide additional empirical support to the developmental view of defensive organization (APA, 1994; Cramer, 1991; Vaillant, 1992). In addition, the positive relationship between Age and female scores on the Adaptive Defense Style provided further evidence of discriminant validity for the two theoretically opposite factors, the adaptive and the maladaptive defense factors. The theoretical opposition between these two factors was further supported by the inclusion of the Sensing – Intuiting dimension in the two models, with opposite signs.

It was also hypothesized that, together with Age, Education may play a role in discriminating between immature and mature defenses. That hypothesis was not confirmed. Similarly, the analysis of individual defense mechanisms revealed that Education was a valid predictor in only four of 24 defense-related models. A possible explanation of this result may be the fact that the composite index Education represents a measure of formal, academic education, as opposed to the informal acquisition of knowledge and life experience (the composite index Education aggregated two sets of raw data: number of years of schooling and highest degree attained). As such, this composite variable cannot reflect a process of maturation and personal growth that may come as result of self-teaching or the exercise of cultural, scientific, or artistic hobbies.

The results of the analyses of defense styles show that introverts are more likely than extraverts to adopt maladaptive defenses when they find themselves in a situation of perceived discomfort or emotional threat. However, these results do not indicate that extraverts are more likely to adopt adaptive defenses under similar circumstances. Also it is important to point out that the results concerning the Introversion attitude in this study must be interpreted in light of the non-clinical nature of this sample. In that sense, the
results indicate a normative tendency among individuals in a non-clinical population, and, as such they confirm similar findings by Costa and McCrae (1992) about the relationship between their NEO-PI domains of Introversion and Neuroticism.

Another significant result was the gender differentiation between the Maladaptive Defense Style and the Neurotic Defense Style. The Maladaptive Defense Style was associated with male participants, while the Gender predictor was rejected from the well-specified model for the Neurotic Defense Style by a small margin (i.e., it was rejected from the first regression model due to its level of statistical significance $p = .053$). The significantly higher scores demonstrated by male participants on the maladaptive defense cluster in this study parallel similar findings by other researchers (e.g., Mahalik, et al., 1998) and point out to specific mechanisms of the male socialization process that contribute to an aggressive defensive configuration. These gender differences become clearer when individual defense mechanisms are investigated.

The ability of the Sensing – Intuiting dimension to discriminate between the conceptually opposite Maladaptive Defense Style and the Adaptive Defense Style provides further support to the validity of those DSQ scales. The discriminant polarity of these associations suggest that the more extreme sensing types may find it more difficult to transcend the concrete immediacy of a perceived situation of discomfort, while the intuitive types may be more adept at envisaging positive or redeeming implications of a given distressing situation. These results are somewhat surprising as they were not expected on the basis of the type descriptions provided in the MBTI manual (Myers, et al., 1998).
With respect to the *Neurotic Defense Style*, the results in this study suggest that individuals who value logic and reason over affect and emotional attachment tend to report fewer instances of neurotic responding to perceived internal or external threat. As the *Feeling* function is associated with higher scores on the *Neurotic Defense Style*, this cluster of defenses can be understood more as a measure of emotionality (see also the points made below under the section entitled *Recommendations for Future Research with and on the DSQ*). Also, the fact that the *Feeling* function is a positive predictor of four out of seven defenses in this cluster contributes to the external validity of this DSQ factor.

**Predicting Defense Mechanisms**

As pointed out earlier, the variable *Age* was found to be a frequent predictor of many defense mechanisms included under the cluster of maladaptive defenses. Considering the non-clinical nature of the sample in this study, these results suggest that, as they advance in age, there is a normative tendency for individuals to minimize their use of the defensive strategies of: *Acting-out, Hypochondriasis, Omnipotence-Devaluation, Passive Aggression, Projection, Regression, Somatization, Undoing*, and *Fantasy*. Age was also predictive of females’ scores on the adaptive defense of *Suppression*. As with the results concerning defense styles, these more specific findings provide an empirical confirmation of the developmental view of defense mechanisms, as was initially hypothesised in this study.

Among the general models predicting individual defense mechanisms (male and female samples combined), *Education* emerged as a predictor of two defenses: *Denial*
and *Splitting*. It is possible that with increased exposure to formal education in academic settings, individuals learn about a wide range of human experiences and are often encouraged to reflect on their own subjective experiences, or confront their own values and beliefs. Particularly, the promotion of critical thinking in a variety of academic programs may help individuals overcome the pitfalls of an all or nothing mode of reasoning, which is characteristic of the defense mechanism of splitting.

*Gender* was found to be a predictor of participants' scores on *Denial, Passive Aggression, Isolation of Affect, Splitting, Omnipotence-Devaluation, and Idealization*, with males showing higher scores on the first four defenses, while female participants scored higher on *Idealization*. With respect to male defensive configuration, high scores on these defenses are associated with the use self-aggrandizing behaviours that compensate for low self-esteem, overacting to negative events, being intolerant, untrusting and critical of others, being emotionally unaffected and distant, or blocking the awareness and expression of vulnerable emotions (Ihilevich & Gleser, 1993b; Mihalik, et al., 1998; O'Neil, 1990).

It is also important to point out that, conceptually, the defense of *Omnipotence-Devaluation* is opposite to that of *Idealization*: in the former case, the individual attributes exaggerated negative qualities to others, while in the latter case the individual attributes exaggerated positive qualities to others. The discriminant validity of the two DSQ scales making up these defenses is supported by the fact that *Gender* was retained as a predictor in both models with opposite signs, meaning that females are consistently more prone than males to attribute exaggerated positive qualities to others, while, males are more likely to devaluate others in their attempt to minimize emotional discomfort.
The variable *Gender*, as a predictor, was also involved in two interaction terms: *SN*Gender was negatively correlated with *Suppression* and the *TF*Gender interaction was positively correlated with *Task Orientation*. These results suggest that intuitive males tend to deal with emotional conflict or internal or external stressors by intentionally avoiding thinking about disturbing problems, wishes, feelings, or experiences. On the other hand, females who score high on the psychological function of *Thinking* are more likely to deal with emotional conflict by intentionally focusing on the task or work project at hand. These results are surprising in terms of the opposite direction for the role played by *Gender*, given the fact that the concepts of *Suppression* and *Task Orientation* are very closely related. A possible explanation for this surprising result may have to do with the low internal consistency of the two scales.

The psychological attitudinal dimension of *Extraversion − Introversion* emerged as a discriminating predictor for *Inhibition* and *Withdrawal*, as was hypothesized. Under conditions of perceived stress or emotional threat, introverts are more likely to respond by withdrawing from interpersonal contact or by limiting specific ego functions in order to avoid conflict with environmental forces or figures. On the contrary, as these results suggest, an extravert is more likely to stay engaged in the interpersonal contact and avoid the emotional threat by emphasizing the amusing or ironic aspect of the conflict.

It was also hypothesized that *Extraversion* would be associated with *Affiliation*, but that hypothesis was not confirmed. A possible explanation for this result may have to do with the content of the items that make up the *Affiliation* defense scale. The result of the factor analysis performed on the DSQ items showed that the defense of Affiliation belonged under the Neurotic Defense Factor instead of the Adaptive cluster as originally
reported by Bond (1991). It may be that, in this sample, the respondents perceived the
two items ([80] When I feel bad, I try to be with someone, and [86] If I were in a crisis, I
would seek out another person who had the same problem) as indicative of some form of
interpersonal dependency, as opposed to the intended meaning as an adaptive ability to
share concerns with others. The Affiliation scale, therefore, may have poor discriminant
power, as evidenced by the low internal consistency of $\alpha = .48$.

The Sensing pole of the functional dimension Sensing – Intuiting was associated
with reported use of Hypochondriasis, Isolation of Affect, Projection, and Splitting. These
results make sense in light of the sensing type’s tendency to focus on the present and on
concrete information gained from the senses. An excessive utilization of this
characteristic may lead to an exaggerated impression of one’s own physical symptoms
(hypochondriasis), as well as a tendency to attribute one’s own perceptions and feelings
onto others (projection). By the same token, the intuitive type’s ability to imagine a
variety of possible scenarios beyond the concrete facts of a given situation would make
that individual very unlikely to utilize an either-or mode of perception (splitting).

As expected, the intuiting end of the Sensing – Intuiting dimension was associated
with Humour and Sublimation. These results provide empirical validation to the
theoretical definitions of these constructs, whereby creative imagination can be seen to
play a major role in an individual’s ability to transcend an otherwise distressing
predicament through positive reappraisal or through an artistic process.

It was hypothesized that Thinking would be a strong predictor of the defenses of
Suppression, Task Orientation, and Isolation of Affect. Those hypotheses were not
confirmed, insofar as Suppression and Isolation of Affect were concerned. Instead, high
scores on the Thinking function were associated with high scores on Omnipotence-Devaluation, while Pseudo-Altruism, Reaction Formation, and Affiliation were associated with high scores on the Feeling function. It is possible that individuals who consciously value emotional attachment to others may find it morally unacceptable to express criticism or feelings of anger towards others. As a result, they may tend to compensate for those unacceptable feelings with behaviours indicative of pseudo-altruism or reaction formation. Also, females who value emotional attachment bonds (high scores on the Feeling function) appear to be more open to sharing their concerns with others, as evinced by the association with higher scores on Affiliation.

The observed association between high scores on Omnipotence-Devaluation and high scores on the Thinking function may be explained by the thinking type’s tendency to formulate self-serving justifications meant to attenuate the awareness of discomforting feelings or emotionally threatening experiences. In that sense, the content of some items making up the Omnipotence-Devaluation scale may be reminiscent of the ego defense of Rationalization, which was not included in the DSQ. Based on the literature discussing the defense of Rationalization, as well as on the definition provided by the DSM-IV (APA, 1994), this defense may be linked to an individual’s tendency to use logic and reasoning for self-justifying purposes. The extent to which this meaning is evoked by some items on the Omnipotence-Devaluation scale may explain the association between this scale and the TF dimension.

One hypothesis concerning the Thinking – Feeling function which was confirmed, although not in the straightforward manner anticipated, was the association between Task Orientation and the interaction term TF*Gender. Given the positive sign of the
relationship, this result indicates that females who scored high on the Thinking function also scored high on the Task Orientation scale. When the Gender variable was removed from the regression equation, the TF function alone did not survive as a statistically significant contributor to the explanation of the variance on Task Orientation for either gender-based sample.

It was hypothesized that the defense of Anticipation would be associated with participants' high scores on the Judging orientation and that hypothesis was confirmed. Based on the definitions of these constructs, an individual who tends to be organized and finds comfort in planning ahead will also tend to search for alternative solutions to a currently distressing experience. In fact, included in the definition of both constructs is the tendency to anticipate possible consequences and future implications of events.

The Judging – Perceiving dimension was also a predictor of Humour. The higher an individual's score is on the Perceiving scale, the higher his or her score will be on the adaptive defense of Humour. This result certainly makes sense in light of spontaneous quality of humour and the perceiving type's agility in adjusting to unforeseen circumstances.

Another way of interpreting the observed associations between defense structures and bipolar psychological type dimensions in this study is by considering the dynamic interplay between conscious and unconscious processes. As mentioned earlier in this document, both instruments used in this research project operationalize concepts proposed by psychodynamic theories that recognize the important role played by conscious and unconscious factors in human adaptation. Defense structures, as measured by the DSQ, represent conscious and behavioural derivatives of postulated unconscious
mechanisms. Reported attitudes (Extraversion or Introversion), functions (Sensing or Intuiting, Thinking or Feeling), and orientations (Judging or Perceiving) represent conscious and frequently utilized preferences that complement postulated unconscious and rarely utilized opposite characteristics. The study of the interplay between conscious and unconscious factors in psychological processes is the crux of all psychodynamic theories of the mind. In Anna Freud’s (Sandler & Freud, 1985) words, “There is an upward movement toward consciousness, which implies the striving for satisfaction, whether in the id or in the unconscious […] On the other hand, there is a reaction from the unconscious ego to push down impulses or memories, or whatever, which are trying to rise up. We have to take both movements into account…” (p. 240). Jung made his views about the complementary relationship between consciousness and the unconscious even more explicit. Talking about the manifest preferences in an individual’s type, Jung (1971) writes: “This one-sidedness would lead to a complete loss of psychic balance if it were not compensated by an unconscious counterposition. Investigation of the unconscious has shown, for example, that alongside or behind the introvert’s conscious attitude there is an unconscious extraverted attitude which automatically compensates his conscious one-sidedness” (p.519).

In light of this view, the results obtained in this study can be interpreted as associations between defense structures and postulated unconscious typological preferences, which are by definition the opposite poles of the reported preferences. Given the way in which typological variables were coded in this study and entered into the regression analyses, it is impossible to distinguish between what are known as the dominant and the auxiliary functions in an individual’s type. However, based on the
consistent order in the labels of bipolar dimensions and the observed sign of each association, one can easily determine the tertiary or the inferior functions as the opposites to the reported ones. According to Jungian type theory, the tertiary and the inferior functions are unconscious, rarely utilized, and least under the individual’s intentional control. In the definition section of *Psychological Types*, Jung (1971) writes about the inferior function: “This term is used to denote the function that lags behind in the process of differentiation [...] Very frequently, indeed as a general rule, a man identifies more or less completely with the most favoured and hence the most developed function. It is this that gives rise to the various psychological types. As a consequence of this one-sided development, one or more functions are necessarily retarded. These functions may properly be called inferior in a psychological but not a psychopathological sense, since they are in no way morbid but merely backward as compared with the favoured function” (p. 450).

In this sense, *Inhibition* and *Withdrawal* can be viewed as manifestations of underdeveloped *Extraversion*. Underdeveloped *Intuition* (as a tertiary or inferior function) can manifest itself as an inability to conceive of others as different from oneself and, as such, may explain some of the higher scores on *Projection*. The underdeveloped *Feeling* function may lead to a tendency to ignore the value of strong emotional attachment bonds with others and, thus, contribute to higher scores on *Omnipotence-Devaluation*. Conceptualized in this way, the observed associations between defense structures and the unconscious, underdeveloped preferences may offer useful insights during the counselling process and convergent avenues towards positive change.
Comments on the Social Desirability Scale

As stated earlier, the DSQ manual (Bond, 1991) provides no information on the interpretation and use of the Social Desirability Scale in spite of the relevance of the issue in the context of ego defense research. Part of the secondary goal of this research project was to investigate the psychometric properties of the SDS and its associations with other construct involved in this study, thus providing further insight into its relationship to ego defense structures.

As Wiggins (1968) pointed out, the concept of *social desirability* (SD) has been applied in two quite different ways: SD can be seen as a property of items or scales, or it may be seen as an individual difference variable. McCrae and Costa (1983) reviewed the research on SD and presented evidence that SD scales should be interpreted as measures of substantive traits rather than as indicators of response bias. In that sense, they pointed out that SD scores should not be used as suppressor variables in correcting scores from other scales. They also argued that regarding high correlations with SD scales as evidence of the invalidity of measures was unjustified.

These considerations are particularly important in a study of ego defense organization, where the tendency to present oneself in a more positive, flattering light, and, as such, to minimize a perceived source of emotional discomfort, can be viewed as a kind of defense. As an individual-difference variable, SD can be conceptualized as the tendency for individuals to be more or less responsive to the SD characteristics of items. McCrae and Costa’s (1983) research has shown that, whether this tendency is attributed to a need for approval, deliberate lying, or unconscious defensiveness, the correlations observed between self-report measures and SD scales reflect substantial overlaps.
The results of this study showed that, as a global measure, the SDS was associated with the Neurotic Defense Style. However, when the total sample was split by gender, that variable did not reach statistical significance for predicting female participant’s responses on the SDS, but survived as a predictor of three SD indices (global scale, Self-Deception, and Impression Management) in the male participants’ responses. Remembering that the SDS items are all negatively keyed, this result means that individuals who score high on the Neurotic Defense Style are less likely to report behaviours that would portray them in a favourable, socially desirable light.

In their study, McCrae and Costa’s (1983) found that individuals “who obtained high scores on the Marlowe-Crowne and Eysenck Personality Inventory lie scales were in fact better adjusted, friendlier, and more open to experience than those who scored low” (p. 886). The authors’ references in this statement are to the constructs of Neuroticism, Extraversion, and Openness, as measured through the Neuroticism-Extraversion-Openness Inventory (NEO). Of these three domains, the strongest correlations observed were between the scores on the SD scales and Neuroticism. A direct comparison between McCrae and Costa’s findings and the results in this study is difficult because the composite measure of Neuroticism in the NEO and that of the Neurotic Defense Style in the DSQ are based on different theories and are operationalized through different items. However, the results obtained in this study do parallel McCrae and Costa’s conclusion and provide additional support to the idea that SD scales should be given substantive interpretations rather than be used to correct scores from other scales for lying.
Clinical Significance and Implications for Counselling

Many researchers and, certainly, most practitioners in the field of counselling and psychotherapy are interested in determining the efficacy of psychotherapy, the benefits derived from it, or its ability to make a difference in clients’ lives. In that sense, it has been argued that “whether a treatment effect exists in the statistical sense has little to do with the clinical significance of the effect” (Jacobson & Truax, 1991, p. 12). The increasing emphasis on the study of clinical significance, as different from statistical significance, has been one of the most recent developments in psychotherapy research. In 1999, the *Journal of Consulting and Clinical Psychology* included a special section on the topic of clinical significance (Vol. 67, No. 3). In reference to this research project, the question addressed in this section is to what extent practitioners can find the results reported in this study to be meaningful for the counselling process and/or applicable to psychotherapy goals.

Various conceptualizations of clinical significance have been proposed and, consequently, there are various ways of measuring it. Kazdin (1999) identified a number of key constructs that determine clinical significance, such as: symptom change, meeting role demands, functioning in everyday life, quality of life (or ability to cope), and subjective judgements. Jacobson and Truax (1991) proposed two types of indexes of clinical significance. The first type of index is based on the calculation of cut-off scores that enable the researcher to classify individual clients as *not improved*, *improved*, or *recovered*, depending on whether the outcome scores fall within normal or dysfunctional population range. Kendall, et al. (1999) explored further applications of the method of normative comparisons and discussed potential theoretical, statistical, and
methodological challenges. The second type of index proposed by Jacobson and Truax, called the Reliable Change Index (RCI), involves the pre-post treatment score difference being divided by the standard error of the differences between the two test scores. Subsequently, Speer (1992) refined the calculation of the RCI to account for the confounding effect of regression to the mean. All of these indexes have been designed for experimental research and are not easily translatable into the language of non-experimental correlational research. Moreover, the comparison with a normative group is not tenable in an exploratory study such as this one, where the results are the only normative values available.

However, an established strategy for estimating the clinical significance of correlational results is the examination of effect size or strength of association (Rosnow & Rosenthal, 1988; Tabachnick & Fidell, 2001). In regression analysis, $R^2$ is a measure of effect size (also called coefficient of determination). Cohen (1977) proposed as a convention that psychological researchers call values of .1 small, values of .3 medium, and values of .5 large. Haase, et al. (1982) reported that the median effect size of research in the Journal of Counseling Psychology for the years 1970-1972 was a magnitude corresponding to what Cohen defined as medium sized.

A cursory look at the $R^2$ values obtained in this study reveals that only 9 models out of 26 (3 models predicting defense factors and 23 models predicting defense mechanisms for the total sample) were capable of explaining over 10% of the variance in participants’ scores on the outcome variables. According to Cohen’s (1977, 1992b) convention, the effect size of the model predicting Maladaptive Defenses, $R^2 = .34$, falls within the medium category, while small effect size values were demonstrated by the
models for Denial, Hypochondriasis, Inhibition, Projection, Isolation of Affect, Omnipotence-Devaluation, Splitting, and Humour ($R^2 = .12, .17, .20, .24, .27, .17, .21,$ and .18, respectively). The examination of these effect size values suggests that practitioners and future researchers need to regard the models included in this study with caution and rely on the conclusions drawn from the more reliable models. Interpretations of inferential models with an effect size under $R^2 = .1$ should be considered tentative at best, particularly when generalizing inferences.

Kazdin (1992) listed a number of potential factors that can operate as threats to statistical conclusion validity, i.e., risk of Type II error. Among them, he mentioned: low statistical power, variability in the procedures, subject heterogeneity, and unreliability of the measures. Each of these factors can be considered as alternate explanations for obtaining a small effect size in a number of models. Related to statistical power is the issue of model specification. In this study, suppressor variables were excluded from a number of models, either due to multicollinearity, or to a spurious moderator effect of an interaction term. Excluding predictors from the regression model always leads to a smaller $R^2$, i.e., a smaller amount of explained variance.

There may have been some variability in the administration procedure. The questionnaires were distributed among participants who self-administered the measures and, thus, may or may not have followed the directions for administration provided on the forms. Sample heterogeneity may also have played a role in increasing the proportion of unexplained variance: an indeterminate number of other variables (such as cultural, environmental, or genetic) may have influenced the participants' scores on the outcome variables beyond the typological and demographic data collected. Finally, as pointed out
in more detail in the section entitled *Recommendations for Future Research with and on the DSQ*, the modest reliability coefficients of some of the DSQ subscales may have affected the observed effect size values of the models for those outcome variables. It is believed that an improved version of the DSQ may lead to higher values of observed effect size.

Another way of examining the effect size of the results obtained in this study is to compare the amount of explained variance between the models including the psychological type predictors and the models based only on the demographic variables. In other words, the question asked would be: Does knowledge of psychological types provide a clinically significant contribution to the explanation of defense score variance, over and above the amount of variance already explained by the demographic characteristics? For a limited number of individual defense mechanisms (i.e., *Acting-Out*, *Denial*, *Fantasy*, *Passive Aggression*, *Regression*, *Somatization*, *Undoing*, and *Idealization*) knowledge of participants' psychological type characteristics did not make any contribution towards explaining more variance in regression models for the total sample; however, with the exception of *Acting-Out*, psychological type characteristics made modest contributions in gender-discriminating models. A comparative look at Table 23 in Appendix VII, *Summary of Regression Results*, reveals that in 9 out of 23 individual defense models the presence of psychological type predictors made the difference between no model and some effect size of small clinical significance. In the case of *Humour*, psychological type predictors explained 22% of the variance in male participants' scores and 16% of the variance in female participants' scores on that defense. Increases in the amount of explained variance due to the presence of
psychological type predictors reached levels of moderate clinical significance ($R^2$ values around .3) for the *Maladaptive Defense Style*, and the individual defenses of *Inhibition, Projection, Isolation of Affect, Omnipotence-Devaluation, Splitting,* and *Humour*.

In light of the observed associations between psychological type dimensions and ego defense configurations, counsellors can expand the range of their therapeutic interventions in at least two important directions. The first important counselling strategy is that of normalization. The findings in this study provide an empirical validation of certain behavioural tendencies that reflect the normative experience of individuals in a non-clinical population. Armed with this information, counsellors can be more empathic towards clients' experiences, as well as help them set up more realistic and personalized goals for the process of change.

The second direction along which these results can inform counselling practice is by providing counsellors with strategic guidelines for capitalizing on their clients' individual potential for expanding their repertoire of adaptive defenses. Counsellors can help clients increase their awareness of a less utilized psychological function by linking it to its associated adaptive defense role. Counsellors' knowledge of the associations between defense structures and their clients' psychological type configurations can help counsellors in one of their most important therapeutic tasks: “involving clients in modifying their defenses while respecting the idiosyncratic functioning of individuals” (Clark, 1998, p. 6). Therefore, a coherent framework for processing clients' defense mechanisms in counselling can increase the effectiveness of a counsellor's interventions.

As a conclusion to this section, it must be pointed out that the ultimate usefulness of any research finding depends on a combination of statistical significance, clinical
significance, and subjective value judgement (Kazdin, 1999). The overall hypothesis in this study has been that knowledge of psychological types significantly improves the clinician's ability to explain and predict respondents' scores on measures of ego defense organization. For a number of individual defense mechanisms and for the Maladaptive Defense factor, that hypothesis was confirmed at a satisfactory level of both statistical and clinical significance. The subjective judgement factor that contributes to a successful application of these results in counselling depends on the counsellor's theoretical orientation, on his or her expertise in integrating the two analytical foci (exploration of psychological types and analysis of ego defense organization), and on the client's experience of reflecting on the connections between these two sets of personal characteristics. The practical validation of these results in counselling rests on the client-counsellor collaborative effort towards clarifying the client-specific overlap or links between self-protecting strategies and typological preferences.

Recommendations for Future Research with and on the DSQ

A secondary goal of this research project has been to investigate the psychometric characteristics of the DSQ and present detailed data on the factor and item structure of the questionnaire in order to identify specific areas in need of further improvement and provide recommendations for future research with and on the measure. Based on this sample, the results of the principal component analysis of the 88 DSQ items revealed that the best factor solution to the DSQ was a three-factor structure, represented by the Maladaptive, Neurotic, and Adaptive defense clusters. This confirmed previous analyses performed by other researchers (Andrews, et al., 1989; 1993; Akkerman, Lewin, & Carr,
The internal consistency demonstrated by each factor provided mixed results. While the *Maladaptive Defense* Factor was characterized by a very high internal consistency coefficient (Cronbach alpha .91), the other two factors enjoyed only moderate reliability coefficients: .60 for the *Neurotic Defense* Factor, and .59 for the *Adaptive Defense* Factor. Similarly, only a few individual defense scales showed high reliability coefficients (Projection = .81, Hypochondriasis = .79, Omnipotence-Devaluation = .71), while the coefficients for the other scales ranged from moderate to unacceptable (see Appendix IV). Similar results obtained by other researchers have led those authors to suggest that the reliabilities of certain defense scales as well as the Neurotic and Adaptive factors should be increased by the addition of well-designed and empirically tested items (Rutherford, et al., 1998).

A number of defense specific questionnaires have been developed by other researchers, many of which have demonstrated satisfactory reliability and validity. Those questionnaires can serve as an extended pool of items from which the most psychometrically robust ones could be selected for an improved version of the DSQ. Among such relevant scales are: altruism (Aiken, 1996; Johnson, et al., 1989); impulsivity (Barratt, 1965); emotion control (Roger & Najarian, 1989); splitting (Gerson, 1984; Gould, et al., 1996); imagination (Siuta, 1996); thought control (Wells & Davies, 1994); suppression (Wagner & Zanakos, 1994); fantasy (Costa & McCrae, 1992;
Merkelbach, Horselenberg, & Muris, 2001); dissociation (Carlson & Putman, 1992; Mann, 1995); humour (Martin & Lefcourt, 1984; Svebak, 1974; Thorson & Powell, 1993); and somatization (Schwartz, Davidson, & Goleman, 1978).

All of the scales containing only two items demonstrated low internal consistency (Cronbach alpha coefficients under .56). Scales consisting of only one item cannot be evaluated in terms of either reliability or validity. Scales consisting of only a few items are comparatively less capable of capturing the range of phenomena assigned to a particular construct. This is what Kazdin (1992) called narrow stimulus sampling, which can be seen as a threat to construct validity in both experimental and correlational research. All of these short scales should, therefore, be expanded. Another suggestion may be to collapse the scales of Suppression and Task Orientation, given the overlap between their semantic areas. If the four items (3, 59, 74, and 84) were to form a single scale (tentatively called Suppression), the reliability of the newly formed scale would be $\alpha = .43$, which, although not high, would be superior to the current values: $\alpha = .37$ for Suppression and $\alpha = .32$ for Task Orientation.

In the opinion of many researchers, including this author, the adaptive mechanism of Sublimation is central to the concept of mature defenses (Laughlin, 1983). As White and Gilliland (1975) stated, when sublimation “is regarded as a defense mechanism, it is conceived to be the most complete, mature, and effective one of all” (p. 109). As such, the DSQ should represent this defense mechanism by a larger number of items tapping a variety or creative, artistic, scientific, or cultural endeavours used as constructive strategies for processing anxiety provoking experiences or impulses. The discriminant validity of item 5 (the only item making up the Sublimation scale) was demonstrated in
this study by the positive loading on the mature defense factor and its negative loading on
the theoretically opposite defense factor. Based on these results, this item should be kept
and more items added to form a revised version of this scale.

Obviously, the psychometrically weakest scale is that of consumption (Cronbach
alpha = .10). Among the three items making up this scale, item 85 (*I smoke when I’m
nervous*) did not load over .10 on any of the three factors. It can be surmised that this
item does not discriminate among levels of defensive responding but rather between
smokers and non-smokers (the former category being represented by 23.5% of the sample
and the latter by 76.5%).

It is a common observation in the literature on test construction that the so-called
‘double-barrel’ questions should be avoided. One example of such an item in the DSQ is
the item 1, measuring *Pseudo-Altruism* (*I get satisfaction from helping others and if this
were taken away from me I would get depressed*).

Another suggestion for improving the DSQ may be to extend the range of
defenses covered by the questionnaire, so as to include clinically important defenses, as
indicated by the DSM-IV taxonomy (see Appendix III) as well as the literature on
defenses in general. The defense scales to be added could be: Altruism, Substitution,
Displacement, Dissociation, Rationalization, Intellectualization, Repression, and Turning
against the Self.

The results of this study have shown that Factor 2 – *Neurotic Defenses* was
predicted by the psychological dimension *Thinking – Feeling* (with four out of seven
defense scales predicted by that same dimension). Given the well-established
intermediary nature of this defense cluster, somewhere between the maladaptive and the
adaptive clusters, a suggestion could be made in favour of changing the name of this defense factor from *Neurotic* to *Emotional*, thus reflecting the emotion-related content of most of the items in this factor. In fact, in their replication of the three-factor solution, Muris and Merkelbach (1996) called this second factor *Emotion-Avoiding*.

With respect to the *Social Desirability Scale* of the DSQ, the results obtained in this study point out to a number of areas in need of improvement. First, by including more reliable items, the overall internal consistency of the SDS, as well as the reliability of the two subscales, can be increased. At the same time, if the score on *Self-Deception* and *Impression Management* are to be given a substantive meaning (as argued earlier in the section *Comments on the SDS*), the selection of additional items must be guided by the effort towards increasing the content and discriminant validity of the scales, whereby the more reliable and valid SDS would be capable of discriminating between this form of defensiveness and the other ego defense mechanisms targeted by the DSQ. In order to better reflect the substantive quality of the SDS, this author agrees with the suggestion made by McCrae and Costa (1983) to relabel the SDS as *need for approval, social naïveté*, or *social adjustment*. As McCrae and Costa pointed out, “these substantive traits should be studied in their own right and may be important in predicting real-life outcomes. Indeed, they may prove yet another instance of the utility of self-report measures in providing accurate assessments of personality” (p. 887).

In conclusion, the results of this study appear to support the findings of other researchers concerning the strengths of the DSQ and its promise for both research and clinical work. It is believed that this study has contributed to the replication research effort and to the process of identifying aspects of the DSQ still in need of improvement.
Future research with and on the DSQ can help increase the reliability and validity of this measure, along the lines of modern integrative test theory, according to which “the process of validation is ongoing and not limited to any one study or observation” (Hubley & Zumbo, 1996, p. 212).
REFERENCES:


Hammer, A. L. (1991). Type and coping resources. Paper presented at a meeting of the Bay Area Association for Psychological Type, Stanford University, CA.


APPENDIXES

I Introductory Letter to Participants
II Demographic Information Form
III Proposed Axis for Further Study: Defensive Functioning Scale
IV Psychometric Characteristics of the Defense Style Questionnaire
V Conceptual Structure of the Defense Style Questionnaire: Three-Factor Solution
VI Glossary of Terms, Definitions, and Brief Descriptions
VII Summary of Regression Results
VIII Certificate of Approval by the Behavioural Research Ethics Board
Appendix II

Demographic Information Form

Title: The Relationship between Psychological Types and Ego Defense Mechanisms: A Correlational Study
Co-Investigator/Student: Mircea A. Munteanu, PhD Candidate, Department of Educational and Counselling Psychology, and Special Education, U.B.C.
Faculty Advisor: Dr. William Borgen, Professor, Department of Educational and Counselling Psychology, and Special Education, U.B.C.

Please, provide the following demographic information:

ID: _____ Age: _____ Gender: M F

What is the degree program you are currently enrolled in? ________________

If you are not currently enrolled in a degree program, what is the highest academic grade you completed? ________________ Please, roughly estimate the total number of years of schooling: ________________

Is English your first language? Yes No If English is your second language, please specify your first language as well: ___________________________

By filling-out these questionnaires, you agree to participate in this study. You may keep the Introductory Letter for your records. Please, return this Demographic Information Form along with the two questionnaires once they have been completed.

Thank you for taking the time to fill-out these questionnaires.
Appendix III

Proposed Axis for Further Study: Defensive Functioning Scale

Adapted from:

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<tbody>
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<tr>
<td>3 Anticipation</td>
<td>11 Intellectualization</td>
</tr>
<tr>
<td>4 Humour</td>
<td>12 Isolation of Affect</td>
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<td>5 Self-Assertion</td>
<td>13 Reaction Formation</td>
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<td>6 Self-Observation</td>
<td>14 Repression</td>
</tr>
<tr>
<td>7 Sublimation</td>
<td>15 Undoing</td>
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<th>Disavowal Level</th>
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<tr>
<td>17 Idealization</td>
<td>20 Projection</td>
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<tr>
<td>18 Omnipotence</td>
<td>21 Rationalization</td>
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<td>25 Acting Out</td>
</tr>
<tr>
<td>23 Projective Identification</td>
<td>26 Apathetic Withdrawal*</td>
</tr>
<tr>
<td>24 Splitting (self- or other-image)</td>
<td>27 Help-Rejecting Complaining</td>
</tr>
<tr>
<td></td>
<td>28 Passive Aggression</td>
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</thead>
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<td></td>
</tr>
<tr>
<td>30 Psychotic Denial*</td>
<td></td>
</tr>
<tr>
<td>31 Psychotic Distortion*</td>
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</tr>
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</table>

### Appendix IV

Psychometric Characteristics of the Defense Style Questionnaire: The Three-Factor Solution

Table 20  *Means, Standard Deviations, Internal Consistency Coefficients, and Subscale-to-Factor Correlations*

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Internal Consistency (Cronbach Alpha)</th>
<th>Subscale-to-Factor Correlations</th>
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<td>2.6385</td>
<td>1.2339</td>
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<td>4.0329</td>
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<td>-</td>
<td>.412**</td>
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<td>Hypochondriasis</td>
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<td>1.8666</td>
<td>.7854</td>
<td>.715**</td>
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<tr>
<td>Inhibition</td>
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<td>1.6316</td>
<td>.6442</td>
<td>.645*</td>
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<tr>
<td>Passive Aggression</td>
<td>3.6685</td>
<td>1.1808</td>
<td>.3331</td>
<td>.571**</td>
</tr>
<tr>
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<td>1.0745</td>
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<td>.858**</td>
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<td>.590**</td>
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<tr>
<td>Undoing</td>
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<td>1.5100</td>
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<td>3.2594</td>
<td>1.5671</td>
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<td>.610**</td>
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<tr>
<td>Omnipotence-Devaluation</td>
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<td>1.3690</td>
<td>.7082</td>
<td>.622**</td>
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<tr>
<td>Idealization</td>
<td>3.8756</td>
<td>2.2223</td>
<td>.5669</td>
<td>.531**</td>
</tr>
<tr>
<td>Splitting</td>
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<td>1.5753</td>
<td>.4848</td>
<td>.578**</td>
</tr>
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<td>Pseudo-Altruism</td>
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<td>.413**</td>
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<tr>
<td>Reaction Formation</td>
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<td>.565**</td>
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<td>Affiliation</td>
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<td>.4786</td>
<td>.414**</td>
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<td>1.6558</td>
<td>.3512</td>
<td>.365**</td>
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<tr>
<td>Humour</td>
<td>5.3365</td>
<td>1.4822</td>
<td>.4844</td>
<td>.513**</td>
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<td>Sublimation</td>
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<td>2.3819</td>
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<td>.516**</td>
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<td>1.7538</td>
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<td>.697**</td>
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<td>Task Orientation</td>
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<td>.3186</td>
<td>.587**</td>
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<tr>
<td></td>
<td>Factor 1</td>
<td>Factor 2</td>
<td>Factor 3</td>
<td>Social Desirability</td>
</tr>
<tr>
<td>------------------------------</td>
<td>----------</td>
<td>----------</td>
<td>----------</td>
<td>--------------------</td>
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<td>Maladaptive</td>
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<td>Adaptive</td>
<td>Desirability</td>
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<td><strong>Females (N = 119)</strong></td>
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<tr>
<td>Mean</td>
<td>2.94</td>
<td>5.08</td>
<td>6.13</td>
<td>6.39</td>
</tr>
<tr>
<td>SD</td>
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<td>.905</td>
<td>1.101</td>
<td>1.01</td>
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<td>Skewness</td>
<td>.329</td>
<td>.269</td>
<td>-.221</td>
<td>-.460</td>
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<tr>
<td><em>Z skewness</em></td>
<td>1.48</td>
<td>1.21</td>
<td>-.99</td>
<td>-2.07</td>
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<td>Kurtosis</td>
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<td>-.004</td>
<td>-.311</td>
<td>.317</td>
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<tr>
<td><em>Z kurtosis</em></td>
<td>-.905</td>
<td>-.095</td>
<td>-.841</td>
<td>.849</td>
</tr>
<tr>
<td><strong>Males (N = 94)</strong></td>
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</tr>
<tr>
<td>Mean</td>
<td>3.42</td>
<td>4.69</td>
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<td>6.60</td>
</tr>
<tr>
<td>SD</td>
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<td>.405</td>
<td>-.722</td>
<td>-.873</td>
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</table>

Notes. N = 213. * p < .05; ** p < .01.

Table 21  Means, Standard Deviations, Skewness and Kurtosis Values for Defense Factors and the Social Desirability Scale by Gender

Note. For females (N = 119), standard error of skewness = .222; standard error of kurtosis = .440. For males (N = 94) standard error of skewness = .249; standard error of kurtosis = .493.
Table 22: Intercorrelations of Defense Mechanism Scales (N = 213)

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<th>11</th>
<th>12</th>
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<tbody>
<tr>
<td>1.</td>
<td>Acting-Out</td>
<td>-</td>
<td>.264**</td>
<td>.221**</td>
<td>.360**</td>
<td>.342**</td>
<td>.303**</td>
<td>.478**</td>
<td>.484**</td>
<td>.478**</td>
<td>.361**</td>
<td>.390**</td>
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<td>2.</td>
<td>Consumption</td>
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<td>.083</td>
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<td>.239**</td>
<td>.078</td>
<td>.212**</td>
<td>.127</td>
<td>.170*</td>
<td>.135*</td>
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<td>3.</td>
<td>Denial</td>
<td>-</td>
<td>.138*</td>
<td>.239**</td>
<td>.110</td>
<td>.242**</td>
<td>.312**</td>
<td>.140*</td>
<td>.074</td>
<td>.140*</td>
<td>-.047</td>
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<tr>
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<td>Fantasy</td>
<td>-</td>
<td>.192**</td>
<td>.337**</td>
<td>.420**</td>
<td>.209**</td>
<td>.225**</td>
<td>.260**</td>
<td>.250**</td>
<td>.117</td>
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<td>5.</td>
<td>Hypochondriasis</td>
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<td>.369**</td>
<td>.392**</td>
<td>.617**</td>
<td>.443**</td>
<td>.395**</td>
<td>.395**</td>
<td>.246**</td>
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<td>6.</td>
<td>Inhibition</td>
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<td>.446**</td>
<td>.378**</td>
<td>.480**</td>
<td>.295**</td>
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<td>Pass. Aggress.</td>
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<td>.457**</td>
<td>.355**</td>
<td>.310**</td>
<td>.337**</td>
<td>.245**</td>
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<td>8.</td>
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<td>.505**</td>
<td>.434**</td>
<td>.537**</td>
<td>.157*</td>
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<td>.459**</td>
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<td>.324**</td>
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<td>.362**</td>
<td>.327**</td>
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** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).
Appendix V

Conceptual Structure of the Defense Style Questionnaire:
The Three-Factor Solution
(Bold numbers represent items that load highly on their respective factors)

Factor I - Maladaptive (Immature) Defenses:

<table>
<thead>
<tr>
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<th>Item</th>
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<tr>
<td>1</td>
<td>Acting-Out</td>
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<tr>
<td>2</td>
<td>Denial</td>
<td>16, 42, 52, 57</td>
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<td>3</td>
<td>Hypochondriasis(^1)</td>
<td>69, 75, 82</td>
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<td>4</td>
<td>Inhibition</td>
<td>10, 17, 29, 41, 50</td>
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<tr>
<td>5</td>
<td>Isolation</td>
<td>70, 76, 77, 83</td>
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<tr>
<td>6</td>
<td>Omnipotence-Devaluation</td>
<td>11, 18, 23, 24, 30, 37</td>
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<td>7</td>
<td>Passive Aggressive</td>
<td>2, 22, 39, 45, 54</td>
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<td>8</td>
<td>Projection</td>
<td>4, 12, 19, 25, 36, 55, 60, 66, 72, 87</td>
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Factor II - Neurotic Defenses:

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<td>Pseudo-Altruism</td>
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<td>Reaction Formation</td>
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<td>19</td>
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Factor III - Adaptive (Mature) Defenses:

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<td>Humour</td>
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<td>22</td>
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Social Desirability Scale\(^2\)

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<tr>
<td>Impression Management</td>
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</table>

\(^1\) Help-Rejecting/Complaining
\(^2\) All Social Desirability items are negatively keyed. Used as a Denial item, statement 57 is reverse-scored.
Appendix VI
Glossary of Terms, Definitions, and Brief Descriptions

Adapted from:


**Acting out** The individual deals with emotional conflict or internal or external stressors by actions rather than reflections or feelings. Defensive acting out is not synonymous with "bad behaviour" because it requires evidence that the behaviour is related to emotional conflicts.

**Affiliation** The individual deals with emotional conflict or internal or external stressors by turning to others for help or support. This involves sharing problems with others but does not imply trying to make someone else responsible for them.

**Anticipation** The individual deals with emotional conflict or internal or external stressors by experiencing emotional reactions in advance of, or anticipating consequences of possible future events and considering realistic, alternative responses or solutions.

**Consumption** The individual deals with emotional conflict or internal or external stressors by ingesting food, alcohol, medication, drugs, or by smoking.

**Denial** The individual deals with emotional conflict or internal or external stressors by refusing to acknowledge some painful aspect of external reality or subjective experience that would be apparent to others.

**Devaluation** The individual deals with emotional conflict or internal or external stressors by attributing exaggerated negative qualities to self or others.

**ENFJ** Individuals of this type tend to be warm, empathetic, responsive, and responsible. Highly attuned to the emotions, needs, and motivations of others, they seem to find potential in everyone and want to help others fulfill their potential. They may act as catalysts for individual and group growth. Loyal, responsive to praise and criticism, ENFJ's tend to be sociable, facilitate others in a group, and provide inspiring leadership.

**ENFP** Individuals of this type tend to be warmly enthusiastic and imaginative. They see life as full of possibilities, make connections between events and information
very quickly, and confidently proceed based on the patterns they see. They want a lot of affirmation from others, and readily give appreciation and support. ENFP's tend to be spontaneous and flexible, and often rely on their ability to improvise and on their verbal fluency.

**ENTJ**  Individuals of this type tend to be frank, decisive, assume leadership readily. They quickly see illogical and inefficient procedures and policies, develop and implement comprehensive systems to solve organisational problems. ENTJ's enjoy long-term planning and goal setting. They are usually well informed, well read, and enjoy expanding their knowledge and passing it on to others. They may be forceful in presenting their ideas.

**ENTP**  Individuals of this type tend to be quick, ingenious, stimulating, alert, and outspoken. They are also resourceful in solving new and challenging problems. ENTP's are usually adept at generating conceptual possibilities and then analysing them strategically. They tend to be good at reading other people. Bored by routine, they will seldom do the same thing the same way, and are apt to turn to one new interest after another.

**ESFJ**  Individuals of this type tend to be warm-hearted; conscientious, and co-operative. They want harmony in their environment and work with determination to establish it. ESFJ's like to work with others to complete tasks accurately and on time. They are loyal and follow through even in small matters. They notice what others need in their day-by-day lives and try to provide it. They also want to be appreciated for who they are and for what they contribute.

**ESFP**  Individuals of this type tend to be outgoing, friendly, and accepting. Exuberant lovers of life, people, and material comforts, they enjoy working with others to make things happen. ESFP’s bring common sense and a realistic approach to their work, and make work fun. They are usually flexible and spontaneous, and adapt readily to new people and environments. They learn best by trying a new skill with other people.

**ESTJ**  Individuals of this type tend to be practical, realistic, matter-of-fact, and decisive. They quickly move to implement decisions. They organize projects and people to get things done, focus on getting results in the most efficient way possible. ESTJ's take care of routine details. They usually have a clear set of logical standards, systematically follow them and want others to also. They can be forceful in implementing their plans.

**ESTP**  Flexible and tolerant, individuals of this type take a pragmatic approach, focused on immediate results. Theories and conceptual explanations bore them - they want to act energetically to solve the problem. They tend to focus on the here-and-now, are spontaneous, and enjoy each moment that they can be active with others. They enjoy material comforts and style. They learn best through doing.

**Extraversion**  People who prefer Extraversion tend to focus on the outer world of people and things.
Fantasy (Autistic) The individual deals with emotional conflict or internal or external stressors by excessive daydreaming as a substitute for human relationships, more effective action, or problem solving.

Feeling People who prefer Feeling tend to base their decisions primarily on values and on subjective evaluation of person-centred concerns.

Judging People who prefer Judging tend to like a planned and organized approach to life and prefer to have things settled.

Humour The individual deals with emotional conflict or internal or external stressors by emphasising the amusing or ironic aspects of the conflict or stressor.

Hypochondriasis (Help-Rejecting/Complaining) The individual deals with emotional conflict or internal or external stressors by complaining or making repetitious requests for help that disguise covert feelings of hostility or reproach toward others, which are then expressed by rejecting the suggestions, advice, or help that others offer. The complaints or requests may involve physical or psychological symptoms or life problems.

Idealization The individual deals with emotional conflict or internal or external stressors by attributing exaggerated positive qualities to others.

INFJ Individuals of this type seek meaning and connection in ideas, relationships, and material possessions. They want to understand what motivates people and are insightful about others. They tend to be Conscientious and committed to their firm values. They develop a clear vision about how best to serve the common good and are organized and decisive in implementing their vision.

INFP Individuals of this type tend to be idealistic, loyal to their values and to people who are important to them. They want an external life that is congruent with their values. Curious, quick to see possibilities, they can be catalysts for implementing ideas. They seek to understand people and to help them fulfill their potential. INFP’s are adaptable, flexible, and accepting unless a value is threatened.

Inhibition The individual deals with emotional conflict or internal or external stressors by limiting or renouncing specific ego functions in order to avoid contradictions with instinctual impulses, moral values, or environmental forces or figures.

INTJ Individuals of this type have original minds and great drive for implementing their ideas and achieving their goals. They quickly see patterns in external events and develop long-range explanatory perspectives. When committed, they organize a job and carry it through. Skeptical and independent, they have high standards of competence and performance for themselves and others.
INTP  Individuals of this type seek to develop logical explanations for everything that interests them. Theoretical and abstract, they are interested more in ideas than in social interaction. Quiet, contained, flexible, and adaptable. INTP’s have unusual ability to focus in depth to solve problems in their area of interest. They tend to be skeptical, sometimes critical, always analytical.

Introversion  Psychological attitude that is characterized by a tendency to focus on the inner world of ideas and impressions.

Intuition  Psychological function that is characterized by a tendency to focus on the future, with a view toward patterns and possibilities.

ISFJ  Individuals of this type are generally quiet, friendly, responsible, and conscientious. They tend to be committed and steady in meeting their obligations. Thorough, painstaking, and accurate. Loyal, considerate, ISFJ’s notice and remember specifics about people who are important to them, and are concerned with how others feel. They strive to create an orderly and harmonious environment at work and at home.

ISFP  Individuals of this type are generally quiet, friendly, sensitive, and kind. They enjoy the present moment and what is going on around them. They like to have their own space and to work within their own time frame. Loyal and committed to their values and to people who are important to them, ISFP’s dislike disagreements and conflicts, and do not force their opinions or values on others.

Isolation of Affect  The individual deals with emotional conflict or internal or external stressors by the separation of ideas from the feelings originally associated with them. The individual loses touch with the feelings associated with a given idea (e.g., a traumatic event) while remaining aware of the cognitive elements of it (e.g., descriptive details).

ISTJ  Individuals of this type are generally quiet, serious, and earn success by thoroughness and dependability. They tend to be practical, matter-of-fact, realistic, and responsible. They decide logically what should be done and work toward it steadily, regardless of distractions. ISTJ’s take pleasure in making everything orderly and organized: their work, their home, their life. They value traditions and loyalty.

ISTP  Individuals of this type are generally tolerant and flexible, quiet observers until a problem appears, then act quickly to find workable solutions. They analyse what makes things work and readily get through large amounts of data to isolate the core of practical problems. ISTP’s are interested in cause and effect, organize facts using logical principles, and value efficiency.

Judging  Psychological orientation that is characterized by a planned and organized approach to life and a preference for having things settled.
Omnipotence  The individual deals with emotional conflict or internal or external stressors by feeling or acting as if he or she possesses special powers or abilities and is superior to others.

Passive Aggression  The individual deals with emotional conflict or internal or external stressors by indirectly or unassertively expressing aggression toward others. There is a façade of overt compliance masking covert resistance, resentment, or hostility. Passive aggression often occurs in response to demands for independent action or performance or the lack of gratification of dependent wishes but may be adaptive for individuals in subordinate positions who have no other way to express assertiveness more overtly.

Perceiving  Psychological orientation that is characterized by a flexible and spontaneous approach to life and a preference for keeping options open.

Projection  The individual deals with emotional conflict or internal or external stressors by falsely attributing to another his or her own unacceptable feelings, impulses, or thoughts.

Pseudo-Altruism  The individual deals with emotional conflict or internal or external stressors by claiming to derive satisfaction from meeting the needs of others. Unlike altruism, pseudo-altruism has a self-sacrificing component and involves a surrender of direct gratification or of instinctual needs in favour of fulfilling the needs of others to the detriment of the self.

Reaction Formation  The individual deals with emotional conflict or internal or external stressors by substituting behaviour, thoughts, or feelings that are diametrically opposed to his or her own unacceptable thoughts or feelings (this usually occurs in conjunction with their repression).

Regression  The individual deals with emotional conflict or internal or external stressors by adopting behaviour more typical of earlier developmental stages.

Sensing  Psychological function characterized by a focus on the present and on concrete information gained from the senses.

Somatization  The individual deals with emotional conflict or internal or external stressors by developing symptoms of physical illness (such as headaches).

Splitting  The individual deals with emotional conflict or internal or external stressors by compartmentalizing opposite affect states and failing to integrate the positive and negative qualities of the self or others into cohesive images. Because ambivalent affects cannot be experienced simultaneously, more balanced views and expectations of self or others are excluded from emotional awareness. Self and object images tend to alternate between polar opposites: exclusively loving, powerful, worthy, nurturant, and kind – or exclusively bad, hateful, angry, destructive, rejecting, or worthless.
**Sublimation** The individual deals with emotional conflict or internal or external stressors by channelling potentially maladaptive feelings or impulses into culturally complex and socially valuable behaviours (e.g., contact sports to channel angry impulses, or using artistic creativity to process or express disturbing emotions).

**Suppression** The individual deals with emotional conflict or internal or external stressors by intentionally avoiding thinking about disturbing problems, wishes, feelings, or experiences.

**Task Orientation** The individual deals with emotional conflict or internal or external stressors by focusing on the task or work project at hand, and, thus, like with suppression, intentionally avoiding thinking about disturbing problems, wishes, feelings, or experiences.

**Thinking** Psychological function characterized by a tendency to base one’s decisions primarily on logic and on an objective analysis of cause and effect.

**Undoing** The individual deals with emotional conflict or internal or external stressors by words or behaviour designed to negate or to make amends symbolically for unacceptable thoughts, feelings, or impulses.

**Withdrawal** The individual deals with emotional conflict or internal or external stressors by avoiding contact with others.
## Appendix VII

Summary of Regression Results

Table 23  *Predictors of Defense Styles and Defense Mechanisms, and Multiple Regression Coefficients*

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<th>Total Sample</th>
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<td>Denial</td>
<td>- Education, - Gender, + TF$^2$</td>
<td>.120</td>
<td>- Education, - Gender</td>
<td>.101</td>
</tr>
<tr>
<td>Hypochondriasis</td>
<td>- Age, + SN, - EI</td>
<td>.168</td>
<td>- Age</td>
<td>.119</td>
</tr>
<tr>
<td>Inhibition</td>
<td>- EI</td>
<td>.205</td>
<td>- Education</td>
<td>.041</td>
</tr>
<tr>
<td>Isolation of Affect</td>
<td>- Gender, - EI, + SN, - Age</td>
<td>.267</td>
<td>- Gender</td>
<td>.118</td>
</tr>
<tr>
<td>Omnipotence-Devaluation</td>
<td>- Age, + TF, - Gender</td>
<td>.170</td>
<td>- Age, - Gender</td>
<td>.130</td>
</tr>
<tr>
<td>Passive Aggression</td>
<td>- Age, - Gender</td>
<td>.088</td>
<td>- Age, - Gender</td>
<td>.088</td>
</tr>
<tr>
<td>Projection</td>
<td>+ SN, - Age, - EI, - Gender</td>
<td>.237</td>
<td>- Age, - Gender</td>
<td>.103</td>
</tr>
<tr>
<td>Regression</td>
<td>- Age</td>
<td>.028</td>
<td>- Age</td>
<td>.024</td>
</tr>
</tbody>
</table>

205
<table>
<thead>
<tr>
<th>Outcome</th>
<th>Total Sample</th>
<th>Total Sample</th>
<th>Females</th>
<th>Males</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All Predictors</td>
<td>Demographic Predictors</td>
<td>All Predictors</td>
<td>All Predictors</td>
</tr>
<tr>
<td>Somatization</td>
<td>- Age .039</td>
<td>- Age .038</td>
<td>- Age, - El .084</td>
<td>- Age .049</td>
</tr>
<tr>
<td>Splitting</td>
<td>+ SN, - Education, - Gender .213</td>
<td>- Education, - Gender .131</td>
<td>+ SN, - Education .266</td>
<td>+ SN, - Education .147</td>
</tr>
<tr>
<td>Undoing</td>
<td>- Age .037</td>
<td>- Age .033</td>
<td>- Age .067</td>
<td>- El .055</td>
</tr>
<tr>
<td>Affiliation</td>
<td>- TF .028</td>
<td>-</td>
<td>- TF .037</td>
<td>-</td>
</tr>
<tr>
<td>Fantasy</td>
<td>- Age .059</td>
<td>- Age .050</td>
<td>- Age .045</td>
<td>- JP, - Age .093</td>
</tr>
<tr>
<td>Idealization</td>
<td>+ Gender .037</td>
<td>+ Gender .040</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Pseudo-Altruism</td>
<td>- TF .056</td>
<td>-</td>
<td>- TF .039</td>
<td>- TF .052</td>
</tr>
<tr>
<td>Reaction Formation</td>
<td>- TF .019</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Withdrawal</td>
<td>- El .044</td>
<td>-</td>
<td>- El .039</td>
<td>- El .063</td>
</tr>
<tr>
<td>Anticipation</td>
<td>+ JP .042</td>
<td>+ Education, + Gender .058</td>
<td>+ JP .053</td>
<td>+ Education .068</td>
</tr>
<tr>
<td>Sublimation</td>
<td>- SN .057</td>
<td>-</td>
<td>-</td>
<td>- SN .096</td>
</tr>
<tr>
<td>Suppression</td>
<td>- SN*Gender .029</td>
<td>-</td>
<td>+ Age .058</td>
<td>-</td>
</tr>
<tr>
<td>Task Orientation</td>
<td>+ TF*Gender .019</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
Table 24  *Predictors of Social Desirability and Their Regression Coefficients*

<table>
<thead>
<tr>
<th>Predictors</th>
<th>Total Sample</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$R^2$</td>
<td>$R^2$</td>
<td>$R^2$</td>
</tr>
<tr>
<td>SDS</td>
<td>+ Neurotic</td>
<td>0.030</td>
<td>+ Neurotic, + JP*Education</td>
</tr>
<tr>
<td>Self-Deception</td>
<td>+ Neurotic</td>
<td>0.042</td>
<td>+ Neurotic Style</td>
</tr>
<tr>
<td>Impression</td>
<td>- Age, - Gender</td>
<td>0.095</td>
<td>+ Neurotic Style, - Age</td>
</tr>
</tbody>
</table>

Table 25  *From Predictor to Outcome (Total Sample)*

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Outcome: Defense Structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Maladaptive Defense Style, Acting-Out, Fantasy, Hypochondriasis, Isolation of Affect, Omnipotence-Devaluation, Passive Aggression, Projection, Regression, Somatization, Undoing.</td>
</tr>
<tr>
<td>Education</td>
<td>Denial, Splitting.</td>
</tr>
<tr>
<td>EI</td>
<td>Maladaptive Defense Style, Humour, Hypochondriasis, Inhibition, Isolation of Affect, Projection, Withdrawal.</td>
</tr>
<tr>
<td>TF</td>
<td>Neurotic Defense Style, Denial, Reaction Formation, Omnipotence-Devaluation, Pseudo-Altruism, Affiliation, Task Orientation.</td>
</tr>
<tr>
<td>JP</td>
<td>Anticipation, Humour.</td>
</tr>
</tbody>
</table>