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**Meta-analyses of interest-personality convergence
using the Strong Interest Inventory and the
Multidimensional Personality Questionnaire**

by

Gena D. Staggs

A dissertation submitted to the graduate faculty
in partial fulfillment of the requirements for the degree of
DOCTOR OF PHILOSOPHY

Major: Psychology (Counseling Psychology)

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Major Professor

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For the Major Program

Dedicated to Mom, Dad, and Vince—
my loving family who believed in me, prayed for me,
and provided unconditional support and encouragement.

TABLE OF CONTENTS

LIST OF TABLES	vi
ACKNOWLEDGEMENTS	viii
ABSTRACT	ix
INTRODUCTION	1
Historical Debate: Does Meaningful I-P Convergence Exist?	1
Heritability of Interests and Personality	3
Heritability of Personality	3
Heritability of Interests	4
Shared Heritability and Underlying Dimensions	4
Summary and Directions	6
Personality Theory and Assessment	7
The FFM/NEO-PI-R	7
The MPQ	9
Scale Comparisons of the MPQ, EPQ, CPI, and NEO-PI-R	17
Interest Theory and Assessment	22
The Strong Interest Inventory (SII)	23
Call for Theory Development and Integration	26
Empirical Studies of I-P Convergence	26
Empirical Studies of RIASEC and FFM Factors	26
Larson et al. (2002) Big Five/Big Six Meta-Analyses	26
Barrick et al. (2003) Big Five/Big Six Meta-Analyses	29
Blake and Sackett's (1999) Rational-Empirical Analyses	31
Empirical Studies of Interest and MPQ Factors	33
Waller et al.'s (1995) Heritability Study	34
Blake and Sackett's (1999) Select SII-MPQ Correlations	36
Morfitt's (1998) SII-MPQ Correlations	36
Larson and Borgen's (2002) Seminal I-P Study	37
Synthesis of Larson and Borgen (2002) and Staggs et al. (2003) Findings	39
Summary and Synthesis of Meaningful Interest-MPQ Correlates	49
Summary of I-P Empirical Studies	55
The Present Study	56
METHOD	58
Literature Search Procedure	58
Excluded Studies	58
Included Studies	60
Forms of the Strong Interest Inventory (SII)	62
Combined Sample Demographics	63
Age	63
Ethnicity	63

Analyses	64
Primary Meta-Analyses	64
Meta-Analyses by Sex	64
Analyses for Moderators	64
RESULTS	66
Primary Meta-Analyses	66
Positive Affectivity (PA) and Interests	72
Absorption (ABS) and Interests	73
Constraint (CT) and Interests	74
Negative Affectivity (NA) and Interests	75
Summary of Substantial I-P Correlations	76
Meta-Analyses by Sex	77
Analysis of Sex as a Moderator	88
Meaningful Sex Differences among SII-MPQ Correlations	88
Summary of Sex as a Moderator	90
Analysis of Age as a Moderator	90
Meaningful Age Differences for SII/MPQ Correlations	91
Summary of Age as a Moderator	92
Summary of Results	93
DISCUSSION	96
Overview of Principal Findings	96
Synthesis of Findings with Relevant Studies of I-P Convergence	98
Positive Affectivity (PA) and Interests	99
Constraint (CT) and Interests	102
Negative Affectivity (NA) and Interests	106
Absorption (ABS) and Interests	107
Summary of Meaningful I-P Intersection	108
Summary of I-P Distinctiveness	109
Influence of Demographic Variables, Genetics, and Societal Gender Roles	109
Implications and Limitations	113
Theory Development	113
Diversity	116
Counseling	117
Conclusion	119
REFERENCES	121

LIST OF TABLES

Table 1.1	NEO-PI-R Big Five Personality Scales with Descriptors	8
Table 1.2	MPQ Primary Scale Descriptors and Internal Consistency Coefficients (Tellegen & Waller, in press)	10
Table 1.3	Summary of Tellegen's (1982) Factor Analyses of Higher-order Scales of the MPQ, CPI, and EPQ	19
Table 1.4	Comparison of MPQ and NEO-PI-R Models (adapted from Church, 1994)	21
Table 1.5	General Occupational Themes (GOTs) of the SII, with Affiliated Basic Interest Scales (BISs) and Descriptions of High Scorers	25
Table 1.6	Comparison of Substantial Correlations between RIASEC and FFM Factors from Meta-Analyses by Larson et al. (2002) and Barrick et al. (2003)	30
Table 1.7	Substantial Increases in Prediction of Interests by Specific Personality Scales—from Larson and Borgen (2002) and Staggs et al. (2003)	40
Table 1.8	Comparison of SII-MPQ Bivariate Correlations $\geq .25$ within the Realistic Domain for Larson and Borgen (2002) and Staggs et al. (2003)	42
Table 1.9	Comparison of SII-MPQ Bivariate Correlations $\geq .25$ within the Investigative Domain for Larson & Borgen (2002) and Staggs et al. (2003)	44
Table 1.10	Comparison of SII-MPQ Bivariate Correlations $\geq .25$ within the Artistic Domain for Larson and Borgen (2002) and Staggs et al. (2003)	45
Table 1.11	Comparison of SII-MPQ Bivariate Correlations $\geq .25$ within the Social Domain for Larson and Borgen (2002) and Staggs et al. (2003)	46
Table 1.12	Comparison of SII-MPQ Bivariate Correlations $\geq .25$ within the Enterprising Domain for Larson and Borgen (2002) and Staggs et al. (2003)	48
Table 2.1	Studies Excluded from the Meta-Analyses	59
Table 2.2	Studies Included in the Meta-Analyses	60
Table 3.1	The Effect Size, Upper and Lower Limits, and p -values for Correlations between Strong Interest Inventory (SII) Scales and Multidimensional Personality Questionnaire (MPQ) Scales	67
Table 3.2	Pearson Product-Moment Correlations for Strong Scales with MPQ Scales—Total Sample ($n = 2023$)	70

Table 3.3	Substantial SII//MPQ Correlations ($r_s \geq .30$), in Descending Order of r	71
Table 3.4	Count of Substantial Interest-Personality Correlations ($r_s \geq .30$) Between Scales within Major SII and MPQ Domains	77
Table 3.5	Effect Sizes with Lower and Upper Limits for Correlations between MPQ and SII Scales for Female and Male Samples, with ANOVA Test Results for Sex Differences	78
Table 3.6	Pearson Product-Moment Correlations for SII Scales and MPQ Scales— Female Sample ($n = 709$)	86
Table 3.7	Pearson Product-Moment Correlations for SII Scales and MPQ Scales— Male Sample ($n = 521$)	87
Table 3.8	Significant Sex Differences among Correlations between SII and MPQ Scales—In Descending Order of the Larger Effect Size (r) of the Two Sex Groups	89
Table 3.9	Significant Age Group Differences among Correlations (r) between SII GOTs and MPQ Scales—In Descending Order of Variance	91
Table 3.10	Synthesis of Pearson Product-Moment Correlations for Strong Scales with MPQ Scales—With Meaningful Age and Sex Group Differences Noted	95

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ABSTRACT

This investigation used a series of meta-analyses to explore convergence between vocational interests and personality as measured by the Strong Interest Inventory (SII; Hansen & Campbell, 1985; Harmon, Hansen, Borgen, & Hammer, 1994) and the Multidimensional Personality Questionnaire (MPQ; Tellegen, 1982; Tellegen & Waller, in press). Findings of the present meta-analyses are compared with findings of two previous meta-analytic studies (i.e., Barrick, Mount, & Gupta, 2003; Larson, Rottinghaus, & Borgen, 2002) that examined interest-personality (I-P) convergence using measures of Holland's occupational types and the Big Five personality factors. By synthesizing studies that administered the MPQ as an alternative to measures of the Big Five, and by including correlations between specific scales of both the SII (i.e., the 25 Basic Interest Scales) and of the MPQ (i.e., the 11 primary factors), a number of substantial I-P correlations were discovered that had not been previously identified by studies that assessed common variance using RIASEC themes and measures of the Big Five. Results are also discussed in context of relevant heritability studies and debated theories regarding the nature of I-P convergence and the development of personality and interests in individuals. Also noteworthy is the demographic diversity (i.e., gifted adolescents, college students, adult career clients) represented by the individual samples included in this study.

The most substantial I-P correlations ranged from .30 to .49—reflecting between 9% and 24% shared variance. The most meaningful of these correlations for theory and application appear to be those between Enterprising interests and Social Potency (SP), Artistic interests and Absorption (ABS), the Realistic GOT and Harm Avoidance (HA), and the Social GOT and Positive Affectivity (PA). The substantial inverse correlation between the Realistic GOT and HA is particularly noteworthy given that previous Big 6/Big 5 meta-analyses did not find any meaningful correlations between the Realistic GOT and personality factors. Neither sex nor age was found to be a substantial moderator of interest-personality correlations.

I. INTRODUCTION

Questions regarding the link between vocational interests and personality have received increasing attention in the past 15 years. Conceptual consideration of the convergence and/or distinctiveness of interest and personality dimensions is not new to the field, but dates back nearly a century to writings by Frank Parsons (1909), who is considered the founder of vocational psychology. Although the idea of convergence between interest and personality constructs has been acknowledged for decades, systematic investigation of the existence and nature of this convergence is relatively recent. With the recent momentum in empirical research, a substantial amount of accrued data now warrants empirical synthesis. Recent efforts toward broad-scale synthesis include both theoretical, literature-based reviews (i.e., Ackerman & Heggstad, 1997; Holland, 1996) and meta-analytic reviews (i.e., Barrick, Mount, & Gupta, 2003; Larson, Rottinghaus, & Borgen, 2002;). With growing empirical support for at least moderate degrees of overlap between some broad interest and personality domains, the focus of research is now shifting from questions of the existence of interest-personality overlap to investigations of the nature of this overlap, the specific loci of convergence and distinction, and the construction of models that explain shared underlying dimensions and development pathways for the two domains. It has become clear that a more comprehensive understanding of the domains of interest and personality is attainable by considering the domains jointly rather than separately.

The following review first briefly outlines the conceptual and literary history of the question of convergence between interests and personality. Subsequently, heritability studies and their relevance for the investigation of common underlying dimensions are discussed. Next, each construct is defined individually, with attention to prominent models of theory and assessment. Finally, empirical studies of interest-personality (I-P) linkage are reviewed, and the relevance and contribution of the present meta-analytic study are explained.

Historical Debate: Does Meaningful I-P Convergence Exist?

Some influential writers in vocational psychology have expressed doubts about the existence of meaningful interest-personality (I-P) overlap (e.g., Dawis, 1991; Fryer, 1931; Hansen, 1984; Osipow, 1983; Parsons, 1909; Super & Crites, 1962). Many more writers, however, have argued against an orthogonal view of these two domains, and instead promoted a more unified view of individuality (e.g., Ackerman & Heggstad, 1997; Berdie, 1944; Blake & Sackett, 1999; Borgen, 1986, 1999; Prediger, 1999; Spokane & Decker, 1999; Terman, 1931). Holland, in particular, has for

many years been a leader in examining the empirical and conceptual overlap of interest and personality domains (Costa, McCrae, & Holland, 1984; Holland, 1959, 1966, 1997, 1999).

Darley (1941; Darley & Hagenah, 1955) was identified by Savickas (1999) as the first to propose that interests are an outgrowth of personality. Darley and Hagenah claimed that “interests are, in effect, the end product of individual development and the bridge by which a particular individual pattern of development crosses over to its major social role in our culture” (1955, p. 191). Since then, writers have expressed views that both concur with (e.g., Holland, 1976) and oppose (e.g., Dawis, 1991) Darley’s conceptualization of interests and personality as interwoven constructs. Borgen (1999) makes the interesting observation that Dawis and Holland draw on the same seminal factor analysis (i.e., Guilford, Christenson, Bond, & Sutton, 1954) to support their opposing views on the matter.

Holland, student of Darley and creator of the prominent RIASEC model, has been a key figure in promoting the view of convergence and the idea that both personality and interests are related to vocational choice (Holland, 1959, 1966, 1976, 1997, 1999). This belief is evident in Holland’s definition of vocational interests as “the expression of personality in work, hobbies, recreational activities, and preferences” (1966, p. 3). Strong (1943) is another highly influential writer who, for many years, has acknowledged the role of personality in the formation of vocational interests. In 1972, Holland and Campbell collaborated to apply Holland’s RIASEC structure to Strong’s vocational interest data and subsequent interest assessment tools.

In his integrative discussion of this topic, Borgen (1999) called for researchers to take a closer look at the similarities in personality and interest measures, making the statement that the “excessive overlap among our measures of individuality can (and should) embarrass us as both practitioners and theoreticians” (p. 390). Dawis (1992) also expressed concern about the amount of redundancy in psychological measuring tools in general. Indeed, it seems to make intuitive sense that enduring styles of thinking, feeling, and acting would influence the kinds of activities and occupations a person likes and dislikes—depending on how these activities either require or discourage expression of a person’s preferential styles. Interests and personality are two major dispositional attributes that impact a wide variety of life and work outcomes via their influence on motivational processes and behaviors (Mount, et al., 2004). Interests and personality influence individuals’ decisions about what activities they will undertake, as well as how much time and effort they will devote to those activities. The addition of the Personal Style Scales, which are personality-type scales, to the 1994 version of the Strong Interest Inventory (SII; Harmon, Hansen, Borgen, &

Hammer) is one clear testament of the growing consensus among leaders in the field about the natural relevance of personality to career assessment (Borgen & Harmon, 1996; Hansen, 2000).

Heritability of Interests and Personality

Additional support for the belief in shared dimensions underlying interests and personality is indicated by heritability studies of each construct. In the 2000 *Handbook of Counseling Psychology*, Swanson and Gore conclude that strong evidence exists for the heritability of personality, but less so for interests. However, recent studies provide strong evidence for the heritability and stability of interests as well—with heritability estimates nearly equaling those for personality.

Heritability of Personality

The widely accepted understanding of personality traits as enduring, stable dimensions is one that implicates the contribution of a genetic component. Twin samples have provided a valuable avenue for studies of personality heritability. Using Falconer's (1960) heritability formula for twin study data (i.e., subtracting correlations of DZ twins from those for MZ twins), Tellegen et al. (1988) reported that the estimates of previous studies (i.e., Goldsmith, 1983; Nichols, 1978) approximated .50 across traits. Tellegen et al. conducted heritability estimates from a sample of twin sets that included twins reared *apart*—a landmark study given that all prior heritability estimates of personality traits had reportedly come only from twins raised together. The Tellegen et al. sample consisted of 402 sets of twins from the Minnesota Twin Registry, with 71 sets of twins reared apart. Using the 11 primary factors of the Multidimensional Personality Questionnaire (MPQ; Tellegen, 1982), heritability estimates ranged from .39 to .58, with an average of .48.

Since Tellegen et al.'s (1988) study, additional researchers have used the MPQ and data from the Minnesota Twin Registry to investigate further the heritability of personality traits. Based on their statistical analysis of the 10-year longitudinal twin data, McGue, Bacon, and Lykken (1993) report that MPQ traits are stable from adolescence through the adult years. McGue et al. also suggest that personality stability in this period results primarily from genetic factors, whereas personality change is primarily associated with environmental factors.

Finkel and McGue (1997) used the MPQ and a powerful twin-family design (rather than a simple twin design) to assess genetic influences on personality in a sample of 1,267 twin families. For the 14 MPQ scales (3 high-order and 11 primary factors), they reported mean heritability estimates of .44 for women and .45 for men. In addition to reporting overall heritability estimates, Finkel and McGue also contributed the following conclusions. First, as they expected, they found no evidence for any influence of the common rearing environment on personality. Second, they found nonadditive/dominance genetic influences for every MPQ scale except Traditionalism and Absorption

(See Table 1.2 for MPQ scale descriptions). Third, in the examination of male and female differences, they reported significant sex differences in heritability for only three of the scales: Alienation, Control, and Absorption—with men having higher heritability for Alienation (47% heritability estimates for males vs. 39% for females) and Control (47% M vs. 33% F), and women having higher heritability for Absorption (44% F vs. 26% M). However, Finkel and McGue reported that the same genetic loci appear to influence personality in both males and females, and found no evidence for sex differences in the way genes influence personality. In sum, data continues to accrue in support of substantial genetic influence across personality traits, with approximately 45-50% of personality trait variance attributable to genetics.

Heritability of Interests

The role of genetics in vocational interests now also seems to be well established (Betsworth, et al., 1994; Gottfredson, 1999; Swanson, 1999; Waller, Lykken, & Tellegen, 1995). Betsworth et al. (1994) concluded that genetic factors account for a range of 30% to 50% of variance in vocational interests, with an average of 36%. Using data from the Minnesota Twin Registry for twins raised both together and apart, Waller et al. (1995) reported that approximately 50% of the variance—and two-thirds of the stable variance—of occupational and leisure time interest scales could be attributed to genetic factors.

As Swanson and Gore (2000) highlight in their review, past studies have indicated the stability of interests for both people in general and members of specific occupational groups (D.P. Campbell, 1966; Strong, 1931). They cite data from Johansson & Campbell (1971), who found test-retest coefficients ranging from .54 to .84 over intervals ranging from 1 year to 23 years. Despite the evidence for interest stability in general, however, Swanson and Gore also report studies that indicate there are considerable individual differences in interest stability, with some individuals demonstrating remarkable stability over time and others showing substantial change. This trend is evidenced by intraindividual correlation coefficients ranging from -.31 to .98 when examined over 3- to 12-year intervals (Hansen & Stocco, 1980; Hansen & Swanson, 1983; Lubinski, Benbow, & Ryan, 1995; Rohe & Krause, 1998; Swanson & Hansen, 1988). Swanson and Gore point out that investigations into what leads to a change in vocational interests, whether or not interest stability can be predicted, and the nature of individual differences in stability of interests beyond the end of the college years are warranted.

Shared Heritability and Underlying Dimensions

Swanson (1999) articulated the question of whether interests are equally influenced by heredity, and which specific interests seem to share the most common genetic influence with

personality. Two recent meta-analyses (Barrick, et al., 2003; Larson, et al., 2002) reviewed studies using measures of Holland's RIASEC interest domains and the FFM (Five Factor Model) and found that the strongest I-P links involve two of the FFM personality dimensions—Extraversion and Openness—and four of the RIASEC interest dimensions—Enterprising, Social, Artistic, and Investigative. (These relations are discussed in more detail in subsequent sections.) The combination of evidence for substantial heritability of both interests and personality, and the consistent overlap of certain broad scales across the two domains, beg two questions: What underlying genetic factors might be shared in common by each domain, and is one domain more proximal to genetics?

Waller, Lykken, and Tellegen (1995) examined the stability of interests as well as the degree and nature of connection between interests and personality. Their methods included calculating correlations and heritability estimates, as well as performing factor analyses and multidimensional scaling on twin data. They studied middle-aged twins (born between 1936 and 1955) who were participants in the Minnesota Twin Registry, as well as their spouses. The sample comprised 1,728 men (mean age 39.45) and 2,286 women (mean age 37.60), and included 768 pairs of twins who were concordant in providing complete test data. These twin sets included 33 pairs of MZ twins and 34 pairs of DZ twins who had been reared apart since infancy. Their correlation data indicated that only two MPQ personality domains (Social Potency and Harm Avoidance) had substantial overlap with more than one interest domain. Combining this correlation data with their heritability analyses, Waller et al. concluded that “although genetic factors account for at least 50% of the stable variance in both the domains of personality (Tellegen et al., 1988) and interests, our data suggest that these genetic factors are not the same in the two domains” (p. 255). (The specific interest-personality convergence findings from this study are discussed in more detail in the subsequent section, *Empirical Studies of I-P Convergence*.)

Ackerman and Heggstad's (1997) investigation extended beyond the question of overlap to speculate about the causal developmental sequence of the domains of personality and interests, and hypothesized that abilities, interests, and personality develop in tandem. They suggest that ability and personality may determine the probability of success in a particular task, whereas interests determine the motivation to attempt the task. Consistent with the Social Cognitive Theory of career development (Lent, Brown, & Hackett, 1994), successes in a particular area would subsequently increase interest in that area, and failures would decrease interest (Swanson & Gore, 2000). Using this conceptualization, interests, personality, and ability are understood to develop in tandem, but personality and ability would continue to shape interests over time.

Holland's long-held and debated belief has been that interests are an expression of personality—which implies that personality is a fundamental domain that influences the closely connected but more “surface” domain of interests. This distinction is consistent with ideas recently clarified by Mount et al. (2004), who cite motivational research (Corno & Kanfer, 1993; Kuhl, 1985, 1987) as the basis for differentiating between interests as “surface traits” and personality as “deep traits.” According to this line of thinking, interests are most closely aligned with wishes and wants, which influence action only when transformed into an intention. These motivational researchers hypothesize that personality traits, on the other hand, are more closely aligned with intentions and actions because they trigger volitional and/or self-regulatory processes that influence allocation of time and effort directed toward goal attainment. From their perspective, personality traits regulate competing tendencies and thus account for the individual differences in performance of people with similar knowledge, skills, abilities, and interests.

Summary and Directions

Additional studies using heritability estimates, sophisticated modeling techniques, and longitudinal data are needed to help answer complex questions about the nature, development, and convergence of personality and interests. As an example from another area of research, Kessler et al. (1992) conducted a genetic epidemiologic investigation of social support, depressed mood, and adjustment to stress. The authors investigated the commonly held belief that social support acts as a buffer for the effect of stress on the development of depression. By surveying twin pairs and using sophisticated modeling techniques, however, they found that in most cases it is the environmental and genetic factors causing support, rather than support itself, that buffer the effects of stress on mood. Studies of this nature are needed in the area of personality and interests in order to clarify the nature of convergence and the order of causality for these domains.

In sum, the groundwork for taking a more unified approach to interests and personality has been laid. Heritability studies and conceptual studies of the overlap in interest and personality can continue to inform each other about the presence of common underlying structures, the specific loci of the stronger connections, the proximity of the domains to genetic factors, and the influence of each domain on behavior and motivational processes. Before looking further into the overlap of these domains, the following sections will address the theory and measurement of each construct separately, with particular attention devoted to the interest and personality instruments emphasized in the current study. Subsequently, recent empirical investigations of the overlap of these two constructs will be reviewed.

Personality Theory and Assessment

A review of literature on personality theory and assessment reveals a wide range of theories and measures, including many measures with no link to theory (Goldberg, 1971; Ackerman & Heggstad, 1997). Ackerman and Heggstad (1997) note the wide variation in specificity and breadth of personality measures, as well as the relative lack of consensus about the structure of individual personality differences. Of the many competing models, Ackerman and Heggstad identify three that have received substantial support in the literature and that provide a reasonable amount of both breadth and specificity for measurement. These three models are Costa and McCrae's 5-factor model (FFM), Eysenck's 3-factor model, and Tellegen's 11-factor model.

The following review focuses primarily on the two models that have been most widely used in recent interest-personality research—the FFM and Tellegen's 11-factor model. The development of the FFM is reviewed first, followed by the development of Tellegen's model and reliability and validity data for the MPQ. Subsequently, available data on how factors of the FFM and the MPQ relate to factors of two other reputable personality measures, the California Psychological Inventory (CPI; Gough, 1957) and the Eysenck Personality Questionnaire (EPQ; Eysenck & Eysenck, 1975), are incorporated in the subsequent section, *Scale Comparisons of the MPQ, EPQ, CPI, and NEO-PI-R*.

The FFM/NEO-PI-R

A suggestion by McDougall in 1932 that personality be broadly analyzed into five distinguishable factors has been recognized in a review by John, Angleitner, and Ostendorf (1988) as the beginning of the systematic endeavor to organize the language of personality. According to Digman (1990), the FFM evolved from a "lexical" approach, which assumes that most personality characteristics have become part of the everyday language used by everyday folks (Norman, 1963). This lexical development process of the FFM began with efforts by Allport and Odbert (1936), who compiled approximately 18,000 descriptors of traits from a dictionary.

Cattell (1943, 1946) furthered development by conducting factor analytic studies in effort to reduce the number of fundamental descriptors. His efforts resulted in several solutions, with the number of basic factors ranging from 12 to more than 30. Fiske (1949) conducted more analyses of Cattell's data and produced a five-factor solution, which was later replicated by several others (e.g., Digman & Takemoto-Chock, 1981; Norman, 1963; Peabody & Goldberg, 1989; Tupes & Christal, 1961). The combination of these endeavors resulted in the FFM, which has come to be a widely recognized model of basic personality dimensions (Digman, 1990; Costa & McCrae, 1992).

The five basic dimensions of the FFM are Extraversion, Agreeableness, Conscientiousness, Emotional Stability vs. Neuroticism, and Openness to Experience. These five broad dimensions subsume a large number of other more distinct and specific characteristics. The Big Five traits and descriptors for each are listed in Table 1.1 below.

Table 1.1

NEO-PI-R Big Five Personality Scales with Descriptors

Big Five Personality Scale	Descriptors of High Scorers
Extraversion	Sociable, active, energetic
Agreeableness	Cooperative, considerate, trusting
Conscientiousness	Dependable, organized, persistent
Emotional Stability (vs. Neuroticism)	Calm, secure, unemotional
Openness to Experience	Imaginative, intellectual, artistically sensitive

The Revised NEO Personality Inventory (NEO PI-R; Costa & McCrae, 1992) is a 240-item inventory developed specifically to measure the 30 traits that define the FFM. Other variations of this measure, all of which assess the Big Five in some way, include: the NEO Five-Factor Inventory (NEO-FFI), a 60-item brief version of the NEO PI-R that provides global scores for the five factors; Your NEO Summary, a brief checklist of standing on the five factors, designed to provide feedback about personality traits in informative and nonthreatening terms; and, the NEO Job Profiler, a tool for quantifying the match between a person and a specific position.

In reference to the FFM, Digman (1990) reports that the field of psychology “has witnessed a rapid convergence of views regarding the structure of the concepts of personality” (p. 418). Since the rise of the Big Five model, personality measures are now often judged by how well they account for these five trait dimensions (Costa, McCrae, & Kay, 1995). However, as Church (1994) points out, “not all personality psychologists embrace the five-factor model (e.g., McAdams, 1992; Waller & Ben-Porath, 1987), and alternative models warrant further study” (p. 898). For example, Eysenck (1992) has maintained that the FFM lacks parsimony in that some of the five factors represent lower-order factors of his three-factor model. Others such as Tellegen (1993) and Pervin (1994) have

questioned the validity of the lexical method used for developing the NEO—suggesting that some important individual differences may not be adequately encoded in everyday language. Ackerman and Heggstad (1997) recommended that, in addition to the Big Five, the broad theoretical perspectives of Eysenck’s three-factor theory and Tellegen’s 11-trait framework be considered useful tools for studies of convergence between interests and personality. Since their recommendation, several studies have made important contributions to I-P research by using Tellegen’s MPQ (e.g., Larson & Borgen, 2002; Staggs, Larson, & Borgen, 2003).

The MPQ

Development. The MPQ (Tellegen, 1982; Tellegen & Waller, in press) evolved from research aimed at refining the measurement and conceptualization of several central personality dimensions emphasized in the literature (Tellegen & Waller, in press). Tellegen describes his “exploratory” approach as distinct from the commonly used “folk concept” approach by his emphasis on the selection of scientific psychological concepts that have been developed by personality psychologists based on the concepts’ perceived importance for description of behavior—regardless of whether or not these concepts are embedded in everyday language. Tellegen and colleagues developed their scale over a period of 10 years by using an empirical, iterative approach. The nature of this approach involved first clarifying primary traits without reference to one specific personality model. Rather than identifying higher-order traits first and then rationally selecting specific facets from relevant literature, higher-order dimensions were identified only *after* primary traits had been refined (Tellegen, 1982). The process involved repeated cycles of trait formulation, item generation, data collection, and item analyses. Each wave of data collection tested tentative construct ideas represented by overinclusive item pools. After each wave, items and constructs were separately analyzed on female and male samples, then revised or replaced as necessary based on results from factor analyses.

With this method of scale development, constructs were expected to evolve and change as part of the process. Convergent correlations of diverse items were used to ascertain the appropriate breadth of a trait, and discriminant correlations determined the limits of a trait (Tellegen & Waller, in press). The end result was the emergence of 11 primary (lower-order) factors and 3 higher-order factors. Specifically, the three higher-order factors are Positive Affectivity (PA), Negative Affectivity (NA), and Constraint (CT). These were derived by first multiplying the 11 primary scale raw scores by their respective factor loadings, and then summing the products (Tellegen, 1982).

Content scales. The MPQ consists of 300 dichotomous, True/False items. The instrument comprises 11 primary (lower-order) factor scales, 3 higher-order factor scales, and 2 validity scales.

The 11 primary scales measure the following constructs: Well Being (WB); Social Potency (SP); Achievement (AC); Social Closeness (SC); Stress Reaction (SR); Alienation (AL); Aggression (AG); Control (CO); Harm Avoidance (HA); Traditionalism (TR); and, Absorption (AB). Brief descriptions and internal consistency coefficients for the primary scales are summarized in Table 1.2 below. The higher-order factors are Positive Affectivity (PA), Negative Affectivity (NA), and Constraint (CT). The factors PA and NA are interpreted as complimentary emotional temperament dimensions, and CT as a behavioral constraint parameter.

Table 1.2

MPQ Primary Scale Descriptors and Internal Consistency Coefficients (Tellegen & Waller, in press)

MPQ Scale	α	Description of a High Scorer
Well-Being (WB)	.89	Has a happy, cheerful disposition; feels good about self and sees a bright future.
Social Potency (SP)	.89	Is forceful and decisive; fond of influencing others; fond of leadership roles.
Achievement (ACH)	.84	Works hard; enjoys demanding projects and working long hours.
Social Closeness (SC)	.85	Is sociable, likes people, and turns to others for comfort.
Stress Reaction (SR)	.89	Is nervous, vulnerable, sensitive, prone to worry.
Alienation (ALI)	.81	Feels mistreated, victimized, betrayed, and the target of false rumors.
Aggression (AGG)	.76	Hurts others for own advantage; will frighten and cause discomfort for others.
Control (CTL) (vs. Impulsiveness)	.86	Is reflective, cautious, careful, rational, planful.
Harm Avoidance (HA)	.84	Avoids excitement and danger; prefers safe activities even if they are tedious.
Traditionalism (TRA)	.85	Desires a conservative social environment; endorses high moral standards.
Absorption (ABS)	.88	Is responsive to evocative sights and sounds; readily captured by entrancing stimuli.

High scorers on the first higher-order factor, Positive Affectivity (PA), “present themselves as efficacious, as actively involved in their social and work environments and as ready to experience the positive emotions congruent with these involvements.” Low scorers “convey less self-efficacy, less active social and work involvement and a higher threshold for positive emotional experiences” (Tellegen & Waller, in press, p. 35). The primary scales most closely associated with PA are Well-Being, Social Potency, Achievement, and Social Closeness.

The second higher-order factor, Negative Affectivity (NA), is associated with the primary scales of Stress Reaction, Alienation, and Aggression. High scorers on NA can be characterized as “often stressed and harassed, as prone to respond with negative emotions (such as anxiety and anger) to everyday vicissitudes, and as enmeshed in adversarial relationships.” Low NA scores reflect a “higher threshold for negative emotional responses and a less adversarial interpersonal outlook” (Tellegen & Waller, in press, p. 35).

Constraint (CT) is the third and final MPQ higher-order factor, and it is associated with three primary scales—Control, Harm Avoidance, and Traditionalism. Individuals with high scores on CT “convey caution, planfulness, a tendency to avoid danger, conventionality and adherence to traditional values.” Low scorers are characterized by “impulsiveness, danger-seeking and rejection of conventional and traditional strictures on behavior” (Tellegen & Waller, in press, p. 36).

One primary scale, Absorption (ABS), does not fit neatly with only one of the three higher-order factors. Instead, this scale loads with nearly equal strength on PA and NA. Although ABS was originally listed with NA, Tellegen (1982) recommends that this scale be considered as an affiliate with both PA and NA. In order to aid clarity, and to emphasize its uniquely strong relation with Artistic interests, Absorption (AB) is treated independently throughout the present study, rather than grouping it with either PA or NA.

Validity scales. Tellegen and Waller (in press) explain that techniques aimed at determining the structure and internal consistencies of a self-report measure depend on the assumption that respondents will respond consistently to items of similar content. Markedly inconsistent, or “aberrant,” response protocols may be the result of a variety of distortions such as: misunderstood instructions or questions due to carelessness or poor reading ability; losing one’s place on the answer sheet, uncooperative random responding, lack of insight into one’s own personality, defensiveness, or deliberate attempts to appear favorable or unfavorable (Piedmont, McCrae, Riemann, & Angleitner, 2000; Tellegen & Waller). Whatever the cause, the result is a technically invalid profile that yields no useful information about the respondent’s personality. Validity scales are useful tools for assessing consistency.

Tellegen originally developed six validity scales for the MPQ (1982), but now recommends only two—the Variable-Response Inconsistency (VRIN) scale and the True-Response Inconsistency (TRIN) scale (Tellegen & Waller, in press). Both scales are designed to assess aberrant inconsistency in a relatively straightforward manner. The design of both scales involves item pairs that are highly intercorrelated and similar in content.

The VRIN consists of 44 item pairs that, if answered consistently, should result in either both *True* or both *False* responses. In this manner, answering *True* to one of the items and *False* to the other item of the pair would be conceptually inconsistent. The raw score is the total number of pairs answered inconsistently, so a high score suggests an individual is responding to items in an indiscriminate manner (Tellegen & Waller, in press).

The TRIN is a more specialized scale constructed to assess content-inconsistent *acquiescent* and *counter-acquiescent* response styles. Regardless of item content, acquiescent respondents tend to respond *True*, and counter-acquiescent respondents tend to respond *False*. The TRIN scale is made up of 27 item pairs that are similar in content if keyed in opposite directions. Inconsistency is scored by the number of items answered *True*. A very high score on the TRIN scale indicates an indiscriminate acquiescent response style, whereas a very low score indicates an indiscriminate counter-acquiescent response style (Tellegen & Waller, in press).

Research on the MPQ validity scales attests to their usefulness. The VRIN and TRIN were evaluated by comparing actual protocols with protocols that were partially altered in one of three ways. For the first set of altered protocols, half of the item responses were arbitrarily interchanged. For the second set, half of the items were recoded *True*; and for the third set, half of the items were recoded *False*. For the first set, the VRIN detected 50% of the altered protocols when the cut-off score was set at the 99th percentile of the normative VRIN distribution. For the second and third sets, the TRIN identified 97% to 99% of the invalid profiles when lower and upper TRIN cut-off scores were set at the 1st and 99th percentiles, respectively, of TRIN's normative distribution. Conservative interpretation of the TRIN and VRIN is recommended in order to avoid rejection of valid records (Tellegen & Waller, in press).

In their discussion of validity scales, Piedmont et al. (2000) cite the following statement made by Butcher and Rouse in their 1996 *Annual Review* chapter: “[P]ersonality assessment instruments, in order to be effective, must have validity scales that can appraise the subject’s level of cooperation, willingness to share personal information, and degree of response exaggeration” (p. 94). Indeed, many personality scales (e.g., MMPI, MPQ) include validity scales. According to Piedmont, there is some debate, however, regarding whether or not current validity scales are sufficiently providing this

information (Borkenau & Ostendorf, 1992; Nicholson & Hogan, 1990; Smith, 1997). For example, the authors of the NEO-PI-R expressly omit the usual validity scales as a result of their belief that there is little empirical justification for their use (Piedmont et al., 2000).

Tellegen and Waller (in press) note the differences between the MPQ's validity scales and some familiar validity scales such as the MMPI's L, F, and K scales and the CPI's Well-Being and Good Impression scales. Tellegen and Waller argue that, by attempting to measure undesirable or desirable patterns of responding, these more traditional scales become confounded with valid personality trait variance. Correlations between the VRIN and TRIN (inconsistency measures) with the MPQ substantive scales, however, are very low. Tellegen and Waller highly recommend use of the MPQ inconsistency scales, and they note that VRIN and TRIN scales are now also available for the MMPI-2 (1989).

Reliability. Reliability tests of the MPQ provide evidence for adequate internal consistencies and test-retest reliabilities comparable with those reported for other personality inventories (Tellegen & Waller, in press, p. 29). Test-retest data were collected for 75 college males and females over a 30-day period. The coefficient for each of the three higher-order scales was .89. The values for the 11 primary scales ranged from .82 (Aggression) to .92 (Social Closeness) (Tellegen, 1982).

Extensive data exist in support of the internal consistency of the MPQ scales. Tellegen (1982) reported initial internal consistency data for groups of college men and women. Internal consistency coefficients (α) for the 11 primary scales in a group of 500 college women ranged from .76 to .89. In a group of 300 college men, alpha coefficients ranged from .83 to .89. Internal consistency data have also been collected from samples of young adults, ages 18-30, representing the Minnesota population. These samples consisted of identical and fraternal twins and their siblings recruited for the Minnesota Twin Study. Internal consistency coefficients for the 11 primary scales ranged from .78 to .89 for the group of 233 men, and from .77 to .90 for the group of 391 women. For the four samples combined, none of the alpha coefficients was below .75, and the median value was .85 (Tellegen & Waller, in press). For all samples, the Aggression scale yielded the lowest coefficients. Finally, a mean inter-item correlation, *rii*, was estimated for each scale across the four samples, resulting in a median value of .18 (Tellegen & Waller, in press).

Reise and Waller (1990) applied Item Response Theory (IRT) to the 11 primary scales of the MPQ in order to "estimate the contribution of each individual item to the measurement precision of an examinee's trait score" (p. 30). This method takes into account the variability of measurement error of a scale across a trait range. Incidentally, Reise and Waller were the first to attempt to fit IRT to an entire personality model (Tellegen & Waller, in press). This study revealed that the MPQ scales

provide an impressive amount of statistical information that allows for precise measurement. These properties make the MPQ a desirable instrument for exploring relations between personality and interests (Waller, Lykken, & Tellegen, 1995).

Construct validity. The exploratory method used to construct the MPQ produced highly independent primary scales ($r = .00$ to $.48$; $M = .16$). Through multiple iterative rounds of factor analyses and revisions, overlapping items were removed so that in the final product, no item contributed to the scoring of more than one primary scale. The inclusion of an item was determined by its convergent and discriminant properties. Thus, the relatively low correlations among MPQ scales constitute a tremendous strength of the measure (Tellegen, 1982, Table 3).

Support for the internal structure of the MPQ was documented from the results of a cross-cultural study in which the authors analyzed MPQ data using the exact factor analysis procedure used by Tellegen in 1982 (Ben-Porath, Almagor, Hoffman-Chemi, & Tellegen, 1995). Ben-Porath and colleagues collected MPQ data from four samples of undergraduate college students. The samples included 212 Israeli men and 371 Israeli women (who completed a Hebrew translation of the MPQ), as well as 718 U.S. men and 296 U.S. women. In addition, a sample of 45 Israeli male technicians completed the Hebrew version of the MPQ. Across all samples, the factor analyses consistently replicated the original 11-factor solution used by Tellegen to form the 11 primary scales. Tellegen and Waller (in press) discuss results of these analyses, citing one sample as representative of the rest of the findings. They report that 571 of the 590 factor loadings (97%) were between $-.20$ and $.20$. Tellegen and Waller conclude that “[s]uch a result can be expected only given a successful effort to develop relatively independent scales” (p. 28).

The research conducted by Ben-Porath et al. (1995) also provides support for cross-cultural application of the MPQ constructs. Ben-Porath et al. performed a principal-order factor analysis on data from the Israeli and U.S. groups. They then used three indexes—the Pearson product-moment coefficient (R), Tucker’s coefficient of congruence, and the Kaiser et al. index of factor similarity (KHB)—to test the correlations between corresponding factor loadings of the two groups. The results of these analyses indicated that the factor structures of all 11 MPQ scales were essentially identical in the two samples (with KHB coefficients ranging from $.98$ to $.99$ and Pearson r s ranging from $.86$ to $.96$). Congruence between the higher-order scales, though not as impressive as the primary scales, was also adequate. For women and men, respectively, the Pearson coefficients (r s) were $.83$ and $.93$ for PA, $.88$ and $.98$ for NA, and $.90$ and $.92$ for CT.

The structure of the MPQ was also validated through a joint factor analysis of the primary and higher-order scales of the MPQ with MMPI-2 (1989) scales in a clinical sample obtained from

the Washington University Twin Study of Psychopathology. In this study, DiLalla, Gottesman, Carey, and Vogler (1993) found meaningful associations between the MPQ primary scales and MMPI-2 scales that served as construct markers. The four-factor solution accounted for 64% of the variance in the MMPI-2 and MPQ scale scores. Of notable interest was the additional finding that the Constraint measure of the MPQ is not represented by any of the MMPI-2 clinical scales, but could provide useful information in the study of psychopathology. The usefulness of broader, normal-range measures of Neuroticism for less severe clinical cases was also suggested.

Harkness, Tellegen, and Waller (1995) used the convergence of self-report data and other-report data to examine the construct validity of MPQ traits. Using a sample of 232 college students, each student was rated by three knowledgeable informants (friend, mother, and father), for a total of 928 participants. The correlations between scores on MPQ primary factors and summed observer ratings were all significant ($p < .01$). These coefficients ranged from .20 for Alienation to .58 for Social Potency, with a median correlation of .48. A correlation matrix of validity coefficients comparing self-report data with other-report data also produced solid evidence for the validity of the MPQ scales. The validity coefficients in the diagonal of the correlation matrix were larger than any other row or column coefficient for all but two traits: Alienation (AL) and Absorption (AB). Given the limitations in others' ability to report on an individual's internal experiences, this data provides strong support for the validity of the MPQ scales (Harkness et al., 1995). In addition, Tellegen and Waller (in press) report that the median of the self-other correlations ($r = .49$) compares favorably with those reported for other inventories.

Convergent and discriminant validity. Existing data provide substantial support for the convergent and discriminant validity of MPQ scales. Tellegen (1982) calculated correlations between the three MPQ higher-order factors and two self-reported mood states, *positive affect* and *negative affect*. Based on a sample of 222 college women and 168 college men, the resulting correlations revealed appropriately differential relations between MPQ's higher-order factors of PA and NA with the mood scales of positive affect (negatively related to depression) and negative affect (related to anxiety). For women and men, respectively, correlations with the positive affect mood scale were .50 and .42 with PA; -.09 and -.24 with NA; and, .05 and .06 with CT. Correlations for women and men, respectively, with the negative affect mood scale were -.20 and -.17 with PA; .53 and .50 with NA; and, .26 and .15 with CT.

Tellegen's identification of Negative Affectivity (NA) as a higher-order factor is also consistent with the conclusions of Watson and Clark's (1984) review and exploratory study of common factors of various measures such as the Beck Depression Inventory, the EPQ, and the

Multiple Affect Adjective Check List. Watson and Clark concluded that a number various personality scales assessing traits such as anxiety, neuroticism, ego strength, general maladjustment, repression-sensitization, and social desirability are actually measures of one stable and pervasive trait—negative affectivity. Watson and Clark describe individuals high in NA as “more likely to experience discomfort at all times and across situations, even in the absence of overt stress. They are relatively introspective and tend differentially to dwell on the negative side of themselves and the world” (p. 465).

Applications and criterion validity. A review of published empirical studies reveals that many meaningful relations have been found between MPQ scales (both primary and higher-order) and a variety of clinical disorders and other mood and behavior-related problems. In adolescents, psychological distress has correlated positively with NA and inversely with PA, and behavioral problems have correlated inversely with CT (Ge & Conger, 1999). Alcoholism has correlated positively with NA, and significant drug use has correlated inversely with CT in adults (McGue, Slutske, & Iacono, 1999). In veterans, substance use-related problems, family history of such problems, and age of their onset has correlated inversely with Control, and history of depression and use of substances alone has correlated inversely with PA (Henderson, Galen, & Deluca, 1998). Dysthymia has correlated positively with NA, Stress Reaction, Aggression, and Alienation, and inversely with Well-Being in adolescent women and men; in adolescent men, dysthymia also correlated inversely with CT, Traditionalism, and Control (Gjerde, Block, & Block, 1988). Health-risk behaviors of adolescents have correlated positively with Alienation and Aggression, and inversely with Traditionalism, Harm Avoidance, and Social Closeness. Anxiety, depression, and conduct disorders in adolescents have correlated positively with NA, Stress Reaction, and Alienation, and inversely with Well-Being, Social Closeness, Control, and PA (Communion type) in adolescents. Substance dependence in adolescents has correlated positively with Social Potency and inversely with CT, Traditionalism, and Harm Avoidance (Caspi et al., 1997; Krueger, Caspi, Moffitt, Silva, & McGee, 1996). Schizophrenia has correlated positively with NA, Alienation, and Stress Reaction, and inversely with PA, Well-Being, Social Closeness, and Achievement (DiLalla & Gottesman, 1995). Finally, delinquency in adults has correlated positively with NA, CT, and Alienation, and inversely with Social Closeness and Social Potency (Krueger et al., 1994). Additional studies of MPQ scales and mood constructs include Larsen and Ketelaar, 1991; Tokar, Davidson, Wheeler, and Doss, 1992; and Zevon and Tellegen, 1982.

Recently, MPQ scales have been used in a couple of intriguing investigations examining physiological aspects of emotion. Comings et al. (2000) found that the MPQ primary scale Control

correlated significantly in the negative direction with an adrenergic receptor gene (ADRA2A) connected with arousal, vigilance, and irritability. White and Depue (1999) reported differential association of personality traits linked with fear and anxiety as measured by norepinephrine- and dark-induced pupil reactivity, respectively. In White and Depue's study, pupillary reactivity to norepinephrine (i.e., trait fear) was strongly and specifically related to the MPQ's Harm Avoidance, but not to the affiliated higher-order NA, whereas reactivity to darkness (i.e., trait anxiety) was strongly related to NA. In addition, during both baseline conditions, individuals relatively low on MPQ primary factors Social Closeness, Well-Being, and Social Potency displayed more dilated pupils, suggesting that the norepinephrine alpha-1 receptor system may even influence resting pupil size. The findings from this study provide interesting information about conceptualizing fear and anxiety as distinct emotional systems.

A variety of other studies using the MPQ have proved it a useful instrument in diverse areas of research. The MPQ has been used as a tool for examining the effect of partners' personality traits on reports of relationship quality and satisfaction (Robins, Caspi, & Moffitt, 2000); personality characteristics of high school athletes and non-athletes at risk for eating disorders (Fulkerson, Keel, Leon, & Dorr, 1999); gender differences in the expression of Stress Reaction (Smith & Reise, 1998); and the correspondence of phenotypic structure of personality with the underlying, etiological structure found by studying twins (Krueger, 2000).

Scale Comparisons of the MPQ, EPQ, CPI, and NEO-PI-R

Studies that have compared MPQ scales with other reputable measures of personality have yielded favorable support for both convergent and divergent validity of the MPQ scales. From a sample of 99 females and 56 males, Tellegen (1982) reported substantial relations between the 11 primary scales of the MPQ, the three "superfactors" of the EPQ, and the 18 scales of the CPI. Tellegen reported scale intercorrelations for males and females separately (and did not provide values for the combined sample). The interested reader is referred to Table 6 in Tellegen's 1982 manual for the full correlation matrix of scales of these three instruments. Highlights of the table are discussed in the following paragraphs.

MPQ and EPQ. The EPQ scales of Extraversion, Neuroticism, and Psychoticism correlated in meaningful ways with primary factors of the MPQ. Extraversion correlated (R) most strongly with two MPQ primary factors—Social Potency (.57 F; .60 M) and Well-Being (.49 F; .61 M). Neuroticism shared a remarkably high correlation with MPQ primary factor, Stress Reaction (.80 F; .78 M), followed by a moderate correlation with Alienation (.49 F; .42 M). Finally, Psychoticism shared correlations above .40 with two MPQ primary factors—Control (-.45 F; -.28 M) and

Aggression (.32 F; .44 M). For the remaining five MPQ primary factors, Social Closeness correlated most strongly with Extraversion (.39 F; .61 M), Harm Avoidance with Psychoticism (-.25 F; -.41 M), and Absorption with Neuroticism (.28 F; .29 M). Traditionalism and Achievement did not clearly correlate with one EPQ scale over the other two (Tellegen, 1982).

MPQ and CPI. Examination of the intercorrelations between CPI scales and MPQ primary scales reveals less meaningful construct overlap than that shared by the aforementioned EPQ scales with MPQ scales. Of the 18 CPI scales, 11 of these scales correlated most strongly with one MPQ primary scale—Stress Reaction. The correlations (*rs*) of Stress Reaction with these 11 CPI scales for women and men, respectively, are as follows: Capacity for Status (-.56 F; -.60 M); Sociability (-.55 F; -.64 M); Social Pressure (-.51 F; -.59 M); Sense of Well-being (-.65 F; -.60 M); Responsibility (-.42 F; -.42 M); Self-Control (-.52 F; -.42 M); Tolerance (-.70 F; -.64 M); Good Impression (-.67 F; -.59 M); Achievement via Conformance (-.61 F; -.60 M); Intellectual Efficiency (-.65 F; -.67 M); and Psychological-Mindedness (-.46 F; -.37 M). In addition to correlating with Stress Reaction, six of the above-mentioned CPI scales correlated at or above .40 (for both women and men) with one or more MPQ Primary scales (Tellegen, 1982):

1. Capacity for Stress with Alienation (-.45 F; -.45 M);
2. Sociability with Well-Being (.50 F; .66 M) and Social Potency (.60 F; .51 M);
3. Sense of Well-being with Alienation (-.65 F; -.53 M) and Absorption (-.40 F; -.40 M);
4. Self-Control with Absorption (-.45 F; -.43 M);
5. Tolerance with Alienation (-.63 F; -.59 M);
6. Intellectual Efficiency with Alienation (-.63 F; -.59 M).

For the remaining seven CPI scales (i.e., those which correlated most strongly with an MPQ scale *other* than Stress Reaction), the strongest correlations with MPQ Primary scales are listed below for women and men, respectively:

1. Dominance with Social Potency (.70 F; .67 M);
2. Self-Acceptance with Social Potency (.56 F; .52 M);
3. Socialization with Social Closeness (.23 F; .43 M);
4. Communality with Control (.39 F; .27 M);
5. Achievement via Independence with Alienation (-.59 F; -.50 M);
6. Flexibility with Control (-.44 F; -.55 M) and Traditionalism (-.43 F; -.49 M);
7. Femininity with Harm Avoidance (.43 F; .23 M).

Finally, the following four MPQ Primary scales did not correlate .40 or greater (for either women or men) with any of the CPI scales: Achievement, Social Closeness, Aggression, and Harm Avoidance (Tellegen, 1982).

Higher-order factors of the MPQ, CPI, and EPQ. In addition to providing inter-correlations for individual scales of the MPQ, the EPQ, and the CPI, Tellegen (1982) also compared higher-order structures of the three instruments. From the MPQ, he used the three higher-order factors of PA, NA, and CT. For the EPQ, Neuroticism, Extraversion, and Psychoticism were used. For the CPI, Tellegen calculated higher-order factor scores from the factor-analytic structure reported by Nichols and Schnell (1963), who identified the following three major dimensions: Value Orientation, Person Orientation, and Flexibility versus Rigidity. Using data collected from the three instruments, Tellegen factor-analyzed the nine major factor measures. He discovered that, for both females and males, the three major dimensions yielded a strikingly convergent-divergent pattern upon rotation. In Tellegen's (1982) manual (Table 7), he presents the results of his factor analyses, which are also summarized in Table 1.3 below.

Table 1.3

Summary of Tellegen's (1982) Factor Analyses of Higher-order Scales of the MPQ, CPI, and EPQ

	Higher-order Factors Across Inventories					
	College Females (<i>n</i> = 99)			College Males (<i>n</i> = 56)		
	I	II	III	I	II	III
MPQ Positive Affectivity	<i>.67</i>	<i>.00</i>	<i>.14</i>	<i>.80</i>	<i>-.06</i>	<i>.27</i>
CPI Person Orientation	<i>.80</i>	<i>-.18</i>	<i>-.19</i>	<i>.81</i>	<i>-.26</i>	<i>.15</i>
EPQ Extraversion	<i>.79</i>	<i>-.08</i>	<i>-.06</i>	<i>.76</i>	<i>-.16</i>	<i>-.05</i>
MPQ Negative Affectivity	<i>-.04</i>	<i>.81</i>	<i>.10</i>	<i>.08</i>	<i>.78</i>	<i>.12</i>
CPQ Value Orientation (reversed)	<i>-.01</i>	<i>.80</i>	<i>-.21</i>	<i>-.21</i>	<i>.80</i>	<i>-.13</i>
EPQ Neuroticism	<i>-.40</i>	<i>.68</i>	<i>.05</i>	<i>-.25</i>	<i>.70</i>	<i>.18</i>
MPQ Constraint	<i>-.11</i>	<i>-.05</i>	<i>.74</i>	<i>-.13</i>	<i>.12</i>	<i>.84</i>
CPI Rigidity	<i>.03</i>	<i>.32</i>	<i>.65</i>	<i>.26</i>	<i>.33</i>	<i>.72</i>
EPQ Psychoticism (reversed)	<i>.03</i>	<i>-.21</i>	<i>.45</i>	<i>-.03</i>	<i>-.37</i>	<i>.56</i>

Note. The highest loading of each variable is in italics. MPQ scales are shaded.

Examination of Table 1.3 (above) reveals the success of the MPQ higher-order factors (i.e., PA, NA, and CT) in differentiating between the three general higher-order factors (I, II, and III). With the exception of the correlation between MPQ PA with Factor III for males (.27), none of the MPQ higher-order factors correlates above .15 with more than one of the three general higher-order factors (I, II, and III). (Note that such a statement cannot be made for the CPI or the EPQ). Thus, the data in Table 1.3 support the integrity of the MPQ and its value for research and assessment.

MPQ and NEO-PI-R. Regarding comparison of Tellegen's model with the FFM, Church (1994) conducted a thorough systematic investigation of the empirical relation between the MPQ and the NEO-PI-R, using a sample of 575 college students. Church assessed how the two models compare in the way they organize the personality domain, how the models relate hierarchically, and whether one model accounts for personality variables that the other model does not assess. Based on joint factor analyses of NEO-PI-R scales and MPQ scales, Church concluded that the two models provide alternative representations of one personality space, but at different hierarchical levels—with each model combining in one factor variables that comprise two factors in the other model. In review, the MPQ contains three higher-order scales and 11 non-overlapping primary factors (although Absorption is often considered with the higher-order scales because it does not have a strong, distinct factor loading with any of the three higher-order scales). The NEO-PI-R contains five higher-order dimensions and 18 facet scales.

In Table 1.4 below, the scales of both the MPQ and the NEO-PI-R are listed adjacently according to similarity of broad constructs, as identified by Church (1994). The specific scales for each instrument are indented beneath their affiliated higher-order dimensions, but one-to-one correspondence between specific primary/facet scales listed adjacently for the two instruments is not suggested (e.g., Warmth does not correspond specifically with Well-Being). In Table 1.4, Tellegen's PA is also divided into Agentic PA and Communal PA—a useful division suggested by Tellegen and Waller (in press), which aids in the factor-analytic comparison of the two models.

Table 1.4

Comparison of MPQ and NEO-PI-R Models (adapted from Church, 1994)

NEO-PI-R	MPQ
Extraversion Warmth Gregariousness Assertiveness Activity Excitement-Seeking Positive Emotions	Positive Affectivity (Agentic)—Well-Being Social Potency Achievement (Communal)—Well-Being Social Closeness
Neuroticism Anxiety Hostility Depression Self-Consciousness Impulsivity Vulnerability Agreeableness (inversely)	Negative Affectivity Stress Reaction Alienation Aggression
Conscientiousness	Constraint Control Harm Avoidance Traditionalism
Openness to Experience Fantasy Aesthetics Feelings Actions Ideas Values	Absorption

Note. Scales are listed adjacently according to similarity of broad constructs. Primary scales and facet scales are indented under each model's higher-order dimensions. One-to-one correspondence between specific primary/facet scales listed adjacently for the two instruments is not suggested.

Church (1994) went on to report what he found to be the best MPQ markers for the major Big Five dimensions, which he summarized as follows:

1. Neuroticism—MPQ Stress Reaction;
2. Agreeableness—MPQ Aggression (inversely);
3. Extraversion—MPQ Communal PA (especially Social Closeness);
4. Conscientiousness—MPQ Achievement, MPQ Control;
5. Openness to Experience—MPQ Absorption, MPQ Traditionalism (inversely).

In sum, Church's study seems to indicate that both models adequately account for the higher-order personality dimensions. Individual preference for one model over the other will thus likely depend on one's preference for the hierarchical organization of one model or the other, and the way the more specific facet (or primary) scales are delineated.

Finally, Blake and Sackett (1999) used Church's (1994) study as well as other studies (e.g., Tellegen & Waller, in press) to select just one MPQ marker for each of the Big Five scales. The markers they chose are consistent with those chosen by Church, except that they opted for an "agentic" PA-affiliated MPQ scale as a marker of Extraversion (i.e., Social Potency) rather than one of the more "communal" scales (e.g., Social Closeness). Blake and Sackett identified the following five MPQ scales as markers for the Big Five dimensions:

1. Neuroticism—MPQ Stress Reaction;
2. Agreeableness—MPQ Aggression (inversely);
3. Extraversion—MPQ Social Potency;
4. Conscientiousness—MPQ Control;
5. Openness to Experience—MPQ Absorption.

In sum, MPQ scales have correlated in meaningful and expected ways with personality scales of other prominent measures and with a variety of mood, behavioral, physiological, and relationship variables. The review that follows will elaborate on the value of the MPQ for research of I-P convergence.

Interest Theory and Assessment

"Interest measurement is one of psychology's most enduring and potent areas of individual differences" (Lubinski & Dawis, 1996, p. 407). In a thorough review of the literature on vocational interests, Savickas (1999) conceptualizes interests as a "complex, adaptive effort to use one's environment to satisfy needs and fulfill values" (p. 50), and "a disposition [that] shows relative strength in activity preferences—that is, competition with other interests for behavioral expression" (p. 51). Nadya Fouad (1999) provides a thorough discussion of 70 years of accumulated evidence

regarding the validity of vocational interest inventories—including the Strong Vocational Interest Blank (SVIB; Campbell, 1971); the Self-Directed Search (SDS; Holland, 1985a; Holland et al., 1994); the Vocational Preference Inventory (VPI; Holland, 1985b); successive versions of the Strong Interest Inventory (SII; Hansen & Campbell, 1985; Harmon et al., 1994); the Kuder Occupational Interest Survey (Kuder & Zytowski, 1991); the Campbell Interest and Skill Survey (Campbell, Hyne, & Nilsen, 1992); and the Revised Unisex Edition of the ACT Interest Inventory (UNIACT-R; Swaney, 1995).

Holland's hexagon (Cole, Whitney, & Holland, 1971) is the pre-eminent model of interest measurement in the field of vocational psychology today. Although Holland has constructed instruments to measure his typology (e.g., the SDS and the VPI), the Strong Interest Inventory's General Occupational Themes (GOTs) actually seem to provide the best fit to Holland's hexagonal model (Rounds, 1995). This finding is not surprising given that Holland himself collaborated on the original construction of the GOT scales for the Strong Vocational Interest Blank, an early version of the Strong Interest Inventory.

The Strong Interest Inventory (SII)

The 1994 SII. The 1994 version of the Strong Interest Inventory (SII; Harmon et al.) consists of 317 items designed to assess interests and, upon scoring, provide interpretive information about how an individual's pattern of responses compares with the response patterns of people in various occupations. The items of the SII consist of words or short phrases describing occupations, occupational activities, hobbies, leisure activities, school subjects, and types of people. For the majority of the items, respondents indicate their preferences by choosing from three response options: *Like, Dislike, or Indifferent*.

The SII is a reputable instrument of established validity and reliability. It contains five main types of scales: 6 General Occupational Themes (GOTs), 25 Basic Interest Scales (BISs), 211 Occupational Scales, 4 Personal Style Scales, and 3 types of Administrative (or validity) Indexes. "The power of the Strong rests on two assumptions: (1) that the day-to-day activities typical of a specific occupation are reflected in the interests of the people who are employed in it and (2) that those who have a similar pattern of interests will be satisfied in that occupation if they have compatible values and the necessary knowledge and abilities" (Harmon et al., 1994, p. 2).

The General Occupational Themes (GOTs) and the Basic Interest Scales (BISs) are the groups of SII scales that measure interests most purely. The GOTs correspond to the categories of Holland's RIASEC hexagon: Realistic (R), Investigative (I), Artistic (A), Social (S), Enterprising (E), and Conventional (C). The BISs—more narrow than the GOTs, but more broad than the Occupational

Scales—are homogeneous scales designed to provide more precise information about a respondent's combination of interests. The BISs report interests in 25 specific areas (e.g., art, science, public speaking), and are organized within the dimensions of the GOTs. The six GOTs, with descriptors, are listed with their affiliated BISs in Table 1.5 on the following page.

The 1994 SII manual (Harmon et al.) provides descriptive evidence for the concurrent validity of the SII's three sets of content (nonoccupational) scales: the 6 GOTs, the 25 BISs, and the four Personal Style scales. Donnay and Borgen (1996) reported on the concurrent validity of the nonoccupational scales from a multivariate perspective. They found that, of the SII scales, the BISs dealt most effectively with the multivariate complexity of vocational interests. Test-retest reliabilities of the 1994 SII were collected over a three- to six-month period in a national sample of working adults, and over a one- to three-month period for three samples of college students. The stability of scores over time was found to be quite high: Across the four samples, correlation coefficients ranged from .66 to .94, with the majority falling at or above .80.

Comparison of the 1985 and 1994 SIIs. The first version of the SII was published in 1985 (Hansen & Campbell). In keeping with the goal of updating the SII in order to reflect rapidly growing and evolving occupations, the BISs were revised slightly in the 1994 version. The total number of BISs increased from 23 to 25, with four new scales added, two scales dropped, and two scales shifted to different GOTs. Domestic Arts (S Theme) was dropped completely, and Adventure (R Theme) was dropped as a BIS, given the name Risk Taking/Adventure, and moved to the new group of Personal Style Scales. The four BISs new to the 1994 SII, with their respective GOTs are: Applied Arts (A), Culinary Arts (A), Computer Activities (C), and Data Management (C). The Business Management BIS (E) and Office Practices BIS (C) were given the updated names of Organizational Management and Office Services, respectively. Two BISs were relocated within the GOT framework: Medical Service was moved from Investigative (I) to Social (S), and Athletics was moved from Social (S) to Realistic (R). In addition, some items were changed within the existing scales in order to increase scale length and enhance reliability. Continuity with the 21 BISs of the 1985 SII was maintained, however, with correlations between the 1985 and 1994 scales all above .94 and a median correlation of .987 (Harmon et al., 1994).

Table 1.5

General Occupational Themes (GOTs) of the SII, with Affiliated Basic Interest Scales (BISs) and Descriptions of High Scorers

SII GOTs and BISs	Description of High Scorers for the GOTs
Realistic (R) Agriculture Nature Military Activities Athletics Mechanical Activities	Building, repairing, and working outdoors. Enjoy working with tools, machines, and equipment. Interested in action rather than thought. Prefer concrete problems to ambiguous, abstract problems.
Investigative (I) Science Mathematics Medical Science	Researching, analyzing, and inquiring. Most comfortable in academic or research environments and enjoy pursuing advanced degrees. Prefer to rely on themselves in their work rather than on others in a group project. Dislike selling and repetitive activities.
Artistic (A) Music/Dramatics Art Applied Arts Writing Culinary Arts	Creating or enjoying art, drama, music, or writing. Value aesthetic qualities and have a great need for self-expression. (Includes those who enjoy being spectators or observers of the arts rather than participants.) Frequently express their artistic interests in leisure or recreational activities as well as in vocational activities or environments. Often quite comfortable in academic or intellectual environments due to typical verbal-linguistic bent.
Social (S) Teaching Social Service Medical Service Religious Activities	Helping, instructing, caregiving. Enjoy working with people. Enjoy working in groups, sharing responsibilities, and being the center of attention. Are often nurturing and teaching, especially of young people. Like to solve problems through discussions of feelings and interactions with others. May enjoy leading, directing, and persuading.
Enterprising (E) Public Speaking Law/Politics Merchandising Sales Organizational Mgmt.	Verbally facile in selling, managing, persuading. Seek positions of leadership, power, and status. Enjoy working with other people and leading them toward organizational goals and economic success. May like to take financial and interpersonal risks, and to participate in competitive activities.
Conventional (C) Data Management Computer Activities Office Services	Accounting, organizing, processing data. Enjoy activities that require attention to organization, data systems, detail, and accuracy. Often enjoy mathematics and data management activities such as accounting and investment management.

Note. BISs are indented below their affiliated GOT. Adapted from the SII Manual (Harmon, et al., 1994).

Call for Theory Development and Integration

Vocational psychologists have traditionally employed the “dustbowl empiricism” approach to defining vocational interests and creating career assessments. These empiricist efforts have resulted in measures that are highly successful in assessing career interests, but are generally atheoretical. As Savickas (1999) pointed out, theoretical and conceptual treatment of vocational interests was still lacking years after Holland criticized vocational psychology for its lack of connection with personality and learning theory back in 1976. Borgen (1999) wrote about the need for attention to the meanings of vocational interests. He reminds readers that when practitioners have clear knowledge and understanding of what test scores mean, they are able to make these scores meaningful to clients in ways that extend beyond application to career interests and work, into aspects of individuality and living that include self-efficacy, personality, values, loving, learning, and playing. Thus, after a history of dustbowl empiricism dotted by sparse opinions and studies of the overlap of personality and interests, it is exciting that systematic theoretical examination of this question has finally begun in recent years.

Empirical Studies of I-P Convergence

In the mid-1980s, Holland and the authors of the NEO-PI (Costa & McCrae, 1985) published a systematic investigation of the overlap of the NEO and RIASEC dimensions (Costa, McCrae, & Holland, 1984). Although the link between personality and interests had been empirically investigated by some authors prior to this time (e.g., Tyler, 1945), the 1984 study by Costa et al. marks the beginning of the recent surge of empirical investigations using measures of the Big Five and Holland’s Big Six. Two recent reviews (i.e., Ackerman & Heggestad, 1997; Holland, 1996) identified the need for researchers in this area to conduct comprehensive meta-analyses of FFM and RIASEC convergence studies. Two groups of researchers have recently done so, resulting in a meta-analytic study contributed by researchers in counseling and vocational psychology (i.e., Larson et al., 2002) and another meta-analytic study contributed by researchers in industrial/organizational psychology (i.e., Barrick et al., 2003).

Empirical Studies of RIASEC and FFM Factors

Larson et al. (2002) Big Five/Big Six Meta-Analyses

The meta-analyses conducted by Larson et al. (2002) included 12 studies that evaluated the overlap of interests and personality using measures of the RIASEC interest types and the Big Five personality traits. Interests were measured with one of three instruments: the 1994 SDS (66% of studies), the 1985 SII (25% of studies), or the 1985 VPI (9% of studies). Personality constructs were measured using some version of the NEO-Personality Inventory-Revised (NEO-PI-R; Costa &

McCrae, 1992). The combined sample included 2571 women and 2358 men representing a fairly diverse age span. Regarding diversity within the 12 studies, two samples were collected outside the USA: DeFruyt and Mervielde (1997) reported on 934 college students in Belgium, and Carless (1999) reported on 139 college students in Austria (as cited in Larson et al.).

Larson and colleagues (2002) predicted five I-P scale relations on the basis of results from the studies they reviewed—namely, Artistic with Openness, Investigative with Openness, Social with Agreeableness, Social with Extraversion, and Enterprising with Extraversion. All five of these predictions were supported by the meta-analyses. Of the mean effect sizes calculated for each of the 30 relations between the six interest dimensions and the five personality dimensions, eight relations appeared substantial. The four strongest relations were:

1. Artistic with Openness ($r = .48$, sharing about 25% of their variance);
2. Enterprising with Extraversion ($r = .41$; 17%);
3. Social with Extraversion ($r = .31$; 10%);
4. Investigative with Openness ($r = .28$; 8%).

Correlations between Conventional and Conscientiousness ($r = .25$; 6%), Enterprising and Conscientiousness ($r = .22$; 5%), and Social and Agreeableness ($r = .19$; 4%) were also considered statistically significant.

As the result of separate analyses conducted by sex, Larson et al. (2002) reported four substantive differences between women and men in the ways dimensions overlapped. First, the correlation between the Realistic GOT and Openness to Experience was slightly positive for women but minimal for men. Each of the other three differences involved Conventional interests. The slightly positive relation for men between the Conventional GOT and Extraversion was negligible for women. There was a modest negative correlation between the Conventional GOT and Openness in women, but only a minimal correlation in men. Finally, the relation between Conventional interests and Conscientiousness was slightly higher for men than for women. Although these four differences were considered substantive, only this last sex difference was large enough to alter the more general findings about the overlap of these dimensions.

Differences by interest measure were also observed in the correlations calculated by Larson et al. (2002). (The SDS was used most—3429 participants, followed by the SII—769 of the participants.) Eight of these differences were considered substantial ($p < .002$), and the biggest differences involved Enterprising interests. With one exception, the SDS was more likely than the SII to yield significant correlations with personality traits. When measured by the SDS, high Enterprising scores tended to correlate with high scores in Extraversion ($r = .50$), high scores in Conscientiousness

($r = .29$), and low scores in Neuroticism ($r = -.24$). When interests were measured with the SII, correlations between Enterprising and Extraversion were comparable to those with the SDS, but the correlations were negligible between the Enterprising GOT and Neuroticism, and between Enterprising and Conscientiousness. In addition, Social interests were meaningfully correlated with Openness ($r = .22$) when interests were measured with the SDS, but this correlation was relatively weak when interests were measured with the SII ($r = .10$).

Less meaningful for practitioners, yet substantial, was the observation that correlations of the Conventional GOT with Neuroticism ($r = -.12$), Openness ($r = -.14$), and Conscientiousness ($r = .29$) were stronger with the SDS than with the SII. With the SII alone, the correlations of the Conventional GOT with Neuroticism ($r = .01$) and Openness ($r = -.01$) were minimal. This finding was consistent with Tyler's observations using the Strong Blank (the precursor to the SII) in 1945. The one exception to the rule of higher correlations with the SDS than with the SII was the relation between Artistic interests and Openness. The relation between the Artistic GOT and the Openness personality scale was stronger with the SII ($r = .58$) than with the SDS ($r = .49$).

Larson et al. (2002) hypothesized that variation in the way the SDS and the SII measure interests provides one plausible explanation for the different correlations these measures produced. Whereas the SDS contains a section that assesses respondents' perceptions of their abilities organized by interest type, the SII contains no such section. The inclusion of this section in the SDS may likely increase its correlations with personality. In spite of stronger correlations observed for some relations when using the SDS rather than the SII, each of the authors' original predictions was supported by the SII alone. The correlations observed with the SDS only were supplementary to the original predictions.

Overall, Larson et al.'s (2002) meta-analyses confirmed the findings of individual empirical studies: "Clearly, there are several strong relationships between some vocational interests and some domains of personality" (p. 15). These four relations are listed again (with corresponding results from Barrick et al., 2003) in Table 1.6 in the next section. Larson et al. point out that the strength of the links between the domains of personality and interest are not, however, universal across traits and factors. For example, they report that the Realistic GOT showed minimal overlap with any of the Big Five factors, and the Neuroticism personality dimension was not consistently connected with any of the interest domains.

The clear areas of linkage confirmed by Larson et al. (2002) led them to discuss theoretical implications for commonalities between the RIASEC and the NEOAC structures. They clarified the overlap by reordering the Big Five personality dimensions as NOAEC to reveal the strongest links.

When this shift is made, Openness aligns with Artistic (i.e., general cultural orientations), and Agreeableness and Extraversion align with Social and Enterprising (i.e., general orientation toward people). Larson et al. propose that this reorganization of personality constructs would be consistent with the historical use of “orientation to people” as a central organizing principle in interest models (e.g., Roe, 1956; Prediger, 1982). Just as the Enterprising and Social dimensions are adjacent in the RIASEC hexagon, it would make sense for Extraversion and Agreeableness to be adjacent in a similar type of personality structure. Thus, Larson et al. point out that their study provided information for the restructuring of the Big Five, which Digman (1997) had begun. This application of interest-personality overlap data to theory and construct development exemplifies the theoretical gains that are possible from further efforts of this kind.

Barrick et al. (2003) Big Five/Big Six Meta-Analyses

Barrick et al. (2003) also used meta-analytic techniques to synthesize findings from studies measuring I-P overlap. Similar to Larson et al. (2003), they focused on RIASEC and FFM measures. Regarding the specific instruments used, Barrick et al. reported that they included a sample if “it used interest or occupational measures (e.g., SDS, VPI, GOT, SCII, etc.) that reported results using Holland’s typology or the scales had a one-to-one correspondence with Hollands’ six types, [c] and it used FFM personality measures or personality measures with facets that corresponded to important components of one of the FFM personality factors” (p. 53). This description indicates that Barrick et al. were more inclusive than Larson et al. in the variety of personality and interest measures they incorporated, resulting in use of 21 studies and 41 independent samples, for a total sample size of 11,559. More specific comparisons of instruments used cannot be made between the two studies because Barrick et al. did not report each of the specific instruments included, nor the number of samples in which each instrument was used.

The Barrick et al. (2003) total sample included 13 samples of college students (including four National Merit finalist groups) and 20 samples of working adults. In spite of sampling differences between Barrick et al. and Larson et al. (2002), the authors reported consistent overall conclusions. Of the 30 possible pairs of I-P correlations, Barrick et al. found only four “true score correlations” that were greater than or equal to .25, and these are the same four substantive relations reported by Larson et al. Findings from both studies are presented in Table 1.6 below.

Table 1.6

Comparison of Substantial Correlations between RIASEC and FFM Factors from Meta-Analyses by Larson et al. (2002) and Barrick et al. (2003)

RIASEC Scale	FFM Scale	Larson et al. (2002)	Barrick et al. (2003)
Artistic	Openness	.48	.39
Enterprising	Extraversion	.41	.41
Social	Extraversion	.31	.29
Investigative	Openness	.28	.25

Note. For Larson et al., $n = 12$ samples; for Barrick et al., $n = 41$ samples.

Examination of Table 1.6 (above) reveals the striking similarity in findings of the two meta-analyses, with the same four most substantial relations identified, and in the same order with the exception of the first two correlations (for which the order is reversed). Three of the top four correlations are somewhat stronger in the Larson et al. (2002) study, which is likely attributable to cleaner data resulting from their more stringent sample inclusion criteria. Similar to Larson et al., Barrick et al. (2003) also reported an absence of significant overlap with Realistic interests, and a modest connection between Conventional interests and Conscientiousness personality type ($r = .19$). Their overall conclusion was that some (but not all) RIASEC types and FFM personality traits share meaningful relations, but the two domains are definitely not merely substitutes for one another.

In addition to inter-scale correlation estimates, Barrick et al. (2003) conducted multiple regression analyses in which each RIASEC type was regressed on the FFM scores (based on meta-analytic estimates). These analyses revealed multiple R s of .47 for Enterprising, .42 for Artistic, .31 for Social, .27 for Conventional, .26 for Investigative, and .11 for Realistic. They found that including multiple personality traits consistently improved the prediction of interests, but only slightly. Only two of the multiple R correlations for all personality traits exceeded .40 (i.e., Artistic and Enterprising). It was particularly noteworthy that for the Realistic type, the multiple R correlation estimate was a mere .11 even after all personality traits had been entered.

Also consistent with Larson et al.'s (2002) findings, Barrick et al. (2003) reported that sex was generally not an important moderator in the way RIASEC and FFM domains overlapped. In fact, sex appeared to be even less of a factor in the Barrick et al. study than in the Larson et al. study. Across all scales, Barrick et al. reported an average correlation sex difference less than .02, with the

largest difference being .12 versus -.01. The authors did not discuss any differences large enough to alter the more general findings.

Intelligence and age of the sample groups were other possible moderators addressed by Barrick et al. (2003) in their discussion; however, they did not report statistical tests or meaningfulness of these moderators for their data. In their discussion of age as a possible moderator, Barrick et al. cite a study by Goh and Leong (1993), which suggests that the strength of personality-interest relations may differ for college students and working adults. Specifically, the expectation is that working adults would have more differentiated interests. Using Eysenck's three factors and the RIASEC, Goh and Leong found that only 1 of 15 correlation estimates exceeded .30. They speculated that the younger age of the college students in their study may have been at least partially responsible for their slightly lower I-P correlations. Barrick et al. report that relations were somewhat stronger (mean increase of .07) for working samples than student samples in their study, with particular increases for Enterprising with FFM traits and Openness to Experience with RIASEC themes.

Barrick et al. (2003) also cite relevant literature regarding personality differences posited between average students and those with high intelligence and/or academic achievement (i.e., Dauber & Benbow, 1990; Goff & Ackerman, 1992). Lubinski and Benbow (1992) reported that differences have been demonstrated in the vocational choices of intelligent students compared with average students. Specifically, they cite two previous studies in which intelligent students reported stronger interests in Realistic and Investigative categories (Benbow & Stanley, 1982; Dauber & Benbow, 1990). As stated above, Barrick et al.'s study included 9 "normal" college samples, 4 samples of National Merit finalists, and 20 samples of working adults. However, statistical tests for a possible moderating effect of intelligence were not reported by Barrick et al.

Finally, Barrick et al. (2003) examined the effect of inventory type as a possible moderator. They reported moderator analyses for type of inventory by examining FFM measures versus lower-level (non-FFM) personality measures and Holland versus non-Holland interest measures. Barrick et al. report that, overall, the relation between FFM-level scores and Holland types was slightly higher than between non-FFM scales and non-Holland types. These differences were noticeably larger for Enterprising and Social types (esp. Openness with Enterprising, and Emotional Stability with Social) and for Openness with all RIASEC types (esp. Social). Because Larson et al. (2002) used only FFM and Holland measures in their moderator analyses, these findings cannot be compared across the two studies.

Blake and Sackett's (1999) rational-empirical analyses. In a related study, Blake and Sackett (1999) examined connections between the FFM and the RIASEC using personality scales of the

MPQ, CPI, and MBTI that had been indicated as markers for FFM scales by previous empirical analyses. Blake and Sackett employed a lexical analysis in order to translate Holland's verbal descriptions into the language of the Big Five factors, and then used the results to predict relations between each of the FFM personality types with each of the RIASEC interest themes. Using two existing databases—a sample of adult clients at a vocational clinic and an entering class at a national military academy—the final sample totaled 457 individuals (206 F, 251 M) who ranged in age from 18 to 65 years. The authors found that all personality dimensions except Neuroticism were well represented in the adjectives used by Holland. They reported that the empirical correlations they found between the FFM marker scales and the RIASEC scales were supported by the predictions they made from adjective-based analyses for the following relations:

1. Extraversion markers were negatively related to the Investigative type;
2. Extraversion markers were positively related to the Enterprising type;
3. Agreeableness markers were primarily positively related to the Social type;
4. Conscientiousness markers typified the Conventional type;
5. Openness markers characterized several types—positively related to the Artistic, Investigative, and Social types, and negatively related to the Conventional type.

Comparison of Blake and Sackett's (1999) observations with results from the two Big 5/Big 6 meta-analytic reviews discussed above (i.e., Larson et al., 2002; Barrick et al., 2003) reveals considerable overlap and generally similar conceptualizations. All three studies agreed on the following three positive relations as substantial:

1. Enterprising with Extraversion;
2. Artistic with Openness;
3. Investigative with Openness.

The three studies did, however, draw some different conclusions about several relations. First, whereas Larson et al. (2002) and Barrick et al. (2003) found Social interests most strongly connected with the Extraverted personality type, Blake and Sackett (1999) instead related Social interests most strongly with markers of Agreeableness and Openness. Second, Blake and Sackett reported a negative relation between Investigative interests and markers of Extraversion, and no such relation was found by Larson et al. nor Barrick et al, who reported Investigative-Extraversion correlations of .03 and .02, respectively. The other two discrepancies both involve the Conventional interest type. Blake and Sackett (1999) reported a negative association between Conventional interests and markers of Openness to Experience. However, both Barrick et al. (2003) and Larson et al. (2002) reported only a slight correlation of -.11 for Conventional with Openness. Finally, Blake

and Sackett (1999) reported that markers of Conscientiousness typified the Conventional type. The Conventional-Conscientiousness correlation estimate varied somewhat between the Larson et al. (2002) and the Barrick et al. (2003) studies (.25 and .19, respectively), but was not considered clinically meaningful in either study.

In sum, the Blake and Sackett (1999) study supports three of the major findings reported by the Larson et al. (2002) and Barrick et al. (2003) meta-analyses, but the remainder of their findings seem to differ as a result of using marker scales from other personality measures rather than actual FFM scales. As a part of their study, Blake and Sackett reported specific correlations for five MPQ scales (those used as markers for FFM scales) with the RIASEC scales. These specific correlations are reported in the following section.

Empirical Studies of Interest and MPQ Factors

At the conclusion of their meta-analytic report of FFM/RIASEC convergence, Larson et al. (2002) noted the importance of two avenues of investigation that researchers should pursue in order to extend and refine understanding of I-P overlap. First, Larson et al. recommended that studies move beyond the use of Big Five measures and consider alternative well-regarded models of personality (e.g., Tellegen's MPQ or Jung's four types). Secondly, they proposed examination of personality-interest overlap using more specific scales in order to clarify existing relations and possibly identify important I-P relations that may be obscured in more general dimensions.

The advantages of using the more specific BISs of the SII in research had also been discussed by Donnay and Borgen (1996), who found that the 25 BISs had superior concurrent validity over the six GOTs in predicting membership in 50 occupational groups (i.e., hit rates of 24% for BISs versus 11% for GOTs). Given their success in using specific scales, Donnay and Borgen recommended continued investigations of this type and subsequent application of these findings to theory and practice. Larson and Borgen (2002), followed by Staggs et al. (2003), subsequently conducted empirical studies that used Tellegen's MPQ as an alternative measure of personality for examining convergence with SII scales. These authors focused on assessing the increased predictive power available by using the more specific (primary) scales of the MPQ to predict specific BISs, rather than examining overlap only with the broad, higher-order domains.

Before turning to the SII-MPQ studies by Larson and Borgen (2002) and Staggs et al. (2003), relevant results of three earlier empirical studies (i.e., Waller et al., 1995; Blake & Sackett, 1999; Morfitt, 1998) that reported some actual and suggested correlations between interest scales and MPQ scales are discussed. Each of these studies addressed I-P convergence using interest and MPQ scales, but reported results in somewhat different manners. Waller et al. (1995) measured interests using non-

SII scales, Blake and Sackett (1999) reported correlations for only five of the MPQ scales, and Morfitt (1998) reported correlations for males and females separately as part of a larger unpublished dissertation. Available results from these studies are reported independently below and then incorporated with the findings from Larson and Borgen (2002) and Staggs et al. (2003) in the synthesis that follows.

Waller et al.'s (1995) Heritability Study

Waller et al. (1995) used correlations, factor analysis, and multidimensional scaling in order to examine I-P convergence, and to provide estimates of the stability and heritability of interest variables. Waller et al. collected their data from a sample of middle-aged twins and their spouses. (This sample was associated with the Minnesota Twin Registry, and is described in detail in the previous section—*Heritability of Personality and Interests*.) Waller et al. measured interests by writing 100 items that they believed tapped 25 interest factors they identified from existing reviews of the interest literature. Unique to this interest measure, about 40% of the items refer to jobs that do not require post-secondary education. In addition, the measure instructs participants to pretend that all jobs yield equal pay and status. These instructions were designed in effort to avoid confounds of talents, abilities, education, or status needs of respondents.

From their analyses, Waller et al. (1995) reported that only two of the eleven MPQ primary factors—Social Potency (SP) and Harm Avoidance (HA)—correlated “strongly” with occupational interests (i.e., had substantial relations with several interest scales and at least one $r > .40$). Social Potency correlated meaningfully ($r \geq .25$) with the following interests: Politics (.46), Law (.37), Personal Service (-.32), Sales (.30), and Numbers (-.26). Harm Avoidance correlated meaningfully ($r \geq .25$) with the following interests: Personal Service (.47), Numbers (.31), Explorer-Scientist (-.38), and Blue Collar (-.25). For six of the MPQ primary factors (i.e., Well Being, Achievement, Stress Reaction, Alienation, Control, Absorption), Waller et al. found no correlations .25 or greater with any interest factors. In total, they reported 17 correlation estimates .25 or greater, 10 of which involved Social Potency and Harm Avoidance (listed above). The remaining seven correlations $\geq .25$ were: Social Closeness with Blue Collar (-.30) and Personal Service (.25); Aggression with Personal Service (-.29) and Religion (-.25); and Traditionalism with Writer (-.27), Explorer-Scientist (-.27), and Religion (.26).

Although Waller et al.'s (1995) occupational interest scales were not designed nor discussed according to the RIASEC model, many of the scale descriptions allow comparison and categorization with RIASEC domains. First, the Blue Collar (i.e., skilled trades such as appliance repair, auto mechanic, carpenter, electrician, and plumber), Athletics, Military, and Farmer scales correspond with

the Realistic (R) domain. Next, the Explorer-Scientist scale (i.e., physical sciences such as astronomy, chemistry, geology, physics) fits with the Investigative (I) domain. Third, the Arts and Crafts (i.e., making hand-worked items), Writer (e.g., novelist, scriptwriter, playwright), and Performing Arts (e.g., singer, actor, dancer) scales fit with the Artistic (A) domain. Fourth, the Religion scale corresponds with the Social (S) domain. Fifth, the Politics, Sales, and Law scales clearly fit with the Enterprising (E) domain. And finally, the Numbers scale (i.e., bookkeeping, accounting, auditing) corresponds with the Conventional (C) domain. Waller et al.'s remaining occupational interest scales—Personal Service, Animals, and Food Service—are more difficult to categorize with one of the RIASEC domains.

In order to facilitate comparison with results from studies in which RIASEC interest scales and personality scales have been correlated, meaningful correlations ($r_s \geq .25$) reported by Waller et al. (1995) between their interest scales and MPQ scales are summarized below in context of the most fitting RIASEC domains.

1. Realistic: Blue Collar with Harm Avoidance (-.25) and Social Closeness (-.25);
2. Investigative: Explorer-Scientist with Harm Avoidance (-.38) and Traditionalism (-.27);
3. Artistic: Writer with Traditionalism (-.27);
4. Social: Religion with Aggression (-.25) and Traditionalism (.26);
5. Enterprising: Politics, Law, and Sales with Social Potency (.46, .37, .30);
6. Conventional: Numbers with Harm Avoidance (.31) and Social Potency (-.26).

In addition to the meaningful correlations highlighted above, the Personal Service scale (e.g., barber, masseur, cosmetician) correlated with Harm Avoidance (.47), Social Potency (-.32), Aggression (-.29), and Social Closeness (.25). The Personal Service scale is more difficult to categorize with one RIASEC domain, but would likely fit best with the Social domain.

Once again, the above RIASEC domains are only suggested as reference points for Waller et al.'s (1995) correlations, as the authors did not themselves relate their occupational interest scales to specific RIASEC domains. Of the correlations listed above, the inverse correlations between the Harm Avoidance and Social Closeness personality scales with the Blue Collar occupational interest scale were particularly noteworthy because they suggested meaningful correlations involving the Realistic domain. Previous Big 6-Big 5 studies had not identified any significant correlations between FFM personality scales with the Realistic GOT. The Waller et al. study is also noteworthy for being the first published study to explore I-P relations using measures other than those developed from FFM and RIASEC models.

For the factor analysis and multidimensional scaling portions of their study, Waller et al. (1995) included only the two “strongly correlated” personality traits—Social Potency (SP) and Harm Avoidance (HA)—in their analyses investigating a higher-order structure for the 17 occupational interest categories. From their results, Waller et al. concluded that interests affiliated with SP and HA are directly trait-related, and also that people’s perceptions of occupations requiring these traits tend to be consensual. They remind readers that low correlations between interest and personality dimensions may indicate that either interests are not relevant to personality, or that people have different perceptions about what personality traits the occupations. Waller et al. concluded that interest and personality domains are relatively independent, with the exception of interest overlap with Social Potency and Harm Avoidance personality traits

Blake and Sackett’s (1999) Select SII-MPQ Correlations

As described in the previous section, *Scale Comparisons of the MPQ, EPQ, CPI, and NEO-PI-R*, Blake and Sackett (1999) examined non-FFM personality scales as markers for FFM factors. They selected one MPQ scale as a marker for each of the FFM factors, and thus they reported correlations between SII scales and only five MPQ scales. Specifically, they reported correlations between the RIASEC General Occupational Themes and the following five primary factors of the MPQ: Social Potency, Aggression, Control, Absorption, and Stress Reaction. For a sample of 457 individuals, they reported the following five correlations as significant ($p < .01$):

1. Absorption with Artistic (.37);
2. Social Potency with Enterprising (.32);
3. Control with Conventional (.22);
4. Social Potency with Social (.20);
5. Control inversely with Artistic (-.16).

The first two relations listed above (Absorption-Artistic and Social Potency-Enterprising) were similarly emphasized as substantial by Larson and Borgen (2002) and Staggs et al. (2003). However, the remaining three correlations were not emphasized by Larson and Borgen nor Staggs et al., and are weaker ($r_s < .25$) than the correlations discussed as substantial in those studies.

Morfitt’s (1998) SII-MPQ Correlations

As part of his dissertation, Morfitt (1998) reported correlations between MPQ scales and scales of the 1985 SII for a sample of 420 non-student adults who received services at a university vocational assessment clinic. Morfitt used principal axis factoring and varimax rotation to identify factors underlying the domains of interests, personality, ability, and needs. Among these four domains, Morfitt found that the I-P trans-domain relations were the strongest in the study. In the

factor analyses for the two samples, trans-domain factors accounted for about 20% of the variance among the scales of the MPQ and the SII.

Morfitt (1998) emphasized three points of I-P convergence. First, he reported his most notable correlations (r s ranging from .29 to .57) as those between Social Potency and the BISs associated with the Enterprising GOT (i.e., Public Speaking, Law/Politics, Merchandising, Sales, and Business Management). Second, Morfitt highlighted the strong negative correlation (-.55) between the Adventure BIS and Harm Avoidance, which was the other MPQ scale that Waller et al. (1995) found considerably related to interests. Although he did not emphasize them in his discussion, Morfitt also found substantial correlations between Absorption and the Artistic GOT and BISs, which were all above .24 (ranging from .27 to .47) except for Writing in men (.18). As discussed below, these findings are similar to those of Larson and Borgen (2002) and Staggs et al. (2003).

Morfitt's (1998) third main conclusion involved a meaningful correlation between Constraint of the MPQ with the Conventional GOT ($r = .27$). This correlation was not reported as meaningful by Larson and Borgen (2002) nor Staggs et al. (2003). Other substantial correlations between GOTs and MPQ higher-order factors reported by Morfitt (1998) but not emphasized by either Staggs et al. (2003) or Larson and Borgen (2002) were the correlations between Positive Affectivity (PA) and two GOTs—namely Social (.30 F; .32 M) and Enterprising (.32 F, M). Finally, Morfitt reported a unique meaningful negative correlation between Constraint and the Artistic GOT for men (-.28).

Larson and Borgen's (2002) Seminal I-P Study

Larson and Borgen (2002) examined relations between SII Basic Interest Scales (BISs) and specific scales of two reputable personality measures—the NEO-PI-R and the MPQ—in a sample of 323 gifted adolescent students. This was a landmark study in that the authors not only used a non-FFM measure of personality to study I-P convergence, but also explicitly tested the value of using specific interest and personality scales rather than only broad/higher-order dimensions. Larson and Borgen were the first to publish and discuss a full correlation matrix between the 14 MPQ scales with both the GOTs and the BISs of the SII. They also were the first to use hierarchical regression in order to determine specific increases in explained interest variance that result from using specific personality scales in addition to higher-order scales. The authors predicted that specific facet scales of the NEO-PI-R and primary (i.e., lower-order) scales of the MPQ would increase meaningful variance in the prediction of 14 hypothesized SII BISs after variation due to the respective higher-order factors had been removed.

Results of Larson and Borgen's (2002) study largely supported their predictions. For example, they found that the higher-order MPQ scale, Positive Affectivity (PA), contributed only 7%

of the variance in the prediction of the Law/Politics BIS, whereas Social Potency (an MPQ primary scale affiliated with PA) contributed an additional 13% variance to the prediction of the Law/Politics BIS (after accounting for variance due to PA). Similarly, the MPQ primary scale, Absorption, accounted for an additional 20% of the variance in the prediction of the Music/Dramatics BIS beyond variance due to higher-order factors Negative Affectivity (2%) and Positive Affectivity (8%). In this manner, Larson and Borgen documented the increasing clarity of I-P overlap that is possible by using more specific scales.

In relation to previous I-P studies using FFM and RIASEC measures, the findings of Larson and Borgen (2002) confirmed overall conclusions regarding broad-domain convergence of these models—namely, that the Enterprising, Social, Artistic, and Investigative domains seem to overlap most with major FFM personality constructs. These specific results are not further discussed here because this data was included in the FFM/RIASEC meta-analyses discussed previously. The strengths of the relations Larson and Borgen found in their adolescent sample, however, were somewhat different than those reported for the meta-analyses. In particular, the correlation between Artistic interests and Openness was stronger, and Extraversion correlated more strongly with Social interests than with Enterprising interests.

Regarding possible gender differences, Larson and Borgen's male sample was too small to warrant analyses by gender. Although they reported that only 17 of 943 correlation differences by gender were significant ($p < .001$) in their study, they acknowledged that previous researchers (e.g., Tokar et al., 1992; Tokar & Swanson, 1995) had identified important gender differences that warrant further investigation.

Some of the most noteworthy findings from Larson and Borgen's (2002) study were meaningful correlations that resulted from use of the MPQ as a measure of personality. Specifically, they reported unexpected negative correlations between MPQ primary factor, Harm Avoidance, with the Realistic GOT and several Realistic BISs. The usefulness of an alternative personality measure was thus demonstrated, as previous FFM/RIASEC studies had not reported any substantial correlations between the Realistic GOT and personality scales. Given the novelties of their study, Larson and Borgen (2002) suggested that similar analyses be conducted in other samples. Staggs et al. (2003) followed this recommendation by administering the MPQ and the SII to a group of college students, and examining the increases in prediction made possible by the use of specific scales. In the following section, the SII-MPQ findings of these two studies are discussed jointly.

Synthesis of Larson and Borgen (2002) and Staggs et al. (2003) Findings

Staggs et al. (2003) examined I-P convergence using the SII and the MPQ, and further tested Larson and Borgen's (2002) assertion that a dramatic increase in variance occurs in the prediction of interests by personality if one examines the overlap using specific scales. In the Staggs et al. study, a sample of 200 college students completed the 1994 Strong Interest Inventory (SII; Harmon et al.) and the Multidimensional Personality Questionnaire (MPQ; Tellegen, 1982; Tellegen & Waller, in press). Both the correlation data and the hierarchical regressions from the Staggs et al. study confirmed the benefit of using specific scales rather than broad scales alone in the examination of interest-personality overlap.

The Staggs et al. (2003) findings corroborated 7 out of 10 specific multivariate hypotheses supported by Larson and Borgen (2002), and also provided support for the general hypothesis that specific MPQ primary factors would contribute significantly to the prediction of SII Basic Interest Scales (BISs) beyond the contribution of the related MPQ higher-order factors. In addition, Staggs et al. (2003) found support for four multivariate predictions that were derived from Larson and Borgen's (2002) correlation data. In sum, 11 multivariate predictions received substantial support—defined by R^2 change values significant at $p < .002$. The increase in variance accounted for in these successful predictions ranged from 5% to 26%. These 11 predictions, and the corresponding findings from Larson and Borgen (2002), are listed in Table 1.7 below. The benefit of using specific scale predictors was illustrated with several MPQ primary factors (i.e., Absorption, Harm Avoidance, Social Closeness, Social Potency, Stress Reaction, Achievement, and Traditionalism) and represented all three major MPQ domains (i.e., Negative Affectivity, Positive Affectivity, and Constraint).

Table 1.7

Substantial Increases in Prediction of Interests by Specific Personality Scales—from Larson and Borgen (2002) and Staggs et al. (2003)

Higher Order Predictor(s)	Primary Factor Predictor	Criterion	Staggs et al. R ² Change	<i>p</i>	Larson & Borgen R ² Change
NA, PA	Absorption	Art (A)	.26	<.001	.19
NA, PA	Absorption	Music/Dramatics (A)	.21	<.001	.20
CT	Harm Avoidance	Mechanical Act. (R) ^a	.17	<.001	--
NA, PA	Absorption	Writing (A)	.16	<.001	--
CT	Harm Avoidance	Science (I) ^a	.10	<.001	--
PA	Social Closeness	Mechanical Act.(R) ^a	.09	<.001	.04
PA	Social Potency	Public Speaking (E)	.09	<.001	.11
NA	Stress Reaction	Athletics (R) ^a	.06	<.001	--
PA	Achievement	Science (I)	.06	<.001	.05
CT	Traditionalism	Religious Activ. (S)	.05	.001	.11
PA	Social Potency	Sales (E)	.05	.001	.05

Note. Dashes indicate hypotheses not tested by Larson and Borgen (2002). ^aNegative correlations.

For bivariate correlations between the Strong and the MPQ, Staggs et al. (2003) established a conservative level of significance at $p < .0001$ by dividing alpha (.05) by the total number of correlations (31 SII scales*14 MPQ scales = 434). Correlations (r_s) .25 and greater were statistically significant at this level. Although Larson and Borgen (2002) reported correlations greater than .20 as statistically significant ($p < .001$) in their study, they emphasized only correlations .30 and greater in their discussion of their results. In the following discussion, correlations .25 and greater in either study are reported and compared across the two studies. Findings of these two studies are emphasized here because they are the only two published reports to date that focus primarily on interest-personality convergence and provide full correlation matrices for all MPQ scales with both GOTs and BISs of the SII for combined samples of males and females. The following integrated discussion of the results of these two studies, along with select findings from aforementioned interest-MPQ studies, serves to highlight both similarities and differences across studies, and thus conveys the need for a comprehensive synthesis of the existing data.

In general, the meaningful correlations between SII and MPQ scales reported by Larson and Borgen (2002) and Staggs et al. (2003) followed similar trends. Larson and Borgen reported a total of 33 correlations $\geq .25$, and Staggs et al. reported a total of 37 correlations $\geq .25$. Of these correlations, 21 were $\geq .25$ in both studies: three involving SII Scales from the Realistic domain; five from the Investigative domain; four from the Artistic domain; three from the Social domain; and six from the Enterprising domain. (Due to changes from the 1985 to the 1994 version of the SII, some correlations could not be compared across the two studies.) For the remaining significant correlations, some notable differences occurred. These differences were not accounted for by one study consistently yielding stronger correlations than the other study. However, of the correlations that were $\geq .25$ in one of the two studies, a greater number of correlations were stronger for Larson and Borgen (i.e., 29 total) than were stronger for Staggs et al. (i.e., 16 total). Of these differences, 24 involved correlations that differed by .10 or more—10 of which were larger for Staggs et al., and 14 of which were larger for Larson and Borgen. For each of the six major SII domains, correlations that were $\geq .25$ in either study are reported below, with particular emphasis on correlations that were $\geq .25$ in both studies.

Correlations with the Realistic GOT and BISs. Table 1.8 (below) lists simple bivariate correlations (r s) involving Realistic scales that were meaningful ($r \geq .25$) in either the Larson and Borgen (2002) study or the Staggs et al. (2003) study. Within the Realistic domain, the correlations were generally somewhat stronger for the Staggs et al. college sample (listed second) than for the Larson and Borgen gifted adolescent sample (listed first). Three correlations were meaningful in both studies, and all involved the MPQ primary factor Harm Avoidance (HA). Namely, HA correlated meaningfully with the Realistic GOT (-.37, -.51), the Mechanical Activities BIS (-.33, -.48), and the Agriculture BIS (-.25, -.29). In addition, HA correlated meaningfully with the Military Activities BIS for Staggs et al. (-.28), but the correlation was slightly weaker for Larson and Borgen (-.24). Harm Avoidance is an MPQ primary factor affiliated with the higher-order factor Constraint (CT). Although the Realistic GOT and the Mechanical Activities BIS also shared meaningful correlations with CT in Staggs et al. (-.39, -.25, respectively), these correlations were weaker than those with the more specific scale, Harm Avoidance, and were not $\geq .25$ in the Larson and Borgen study (i.e., -.21, -.17, respectively).

Table 1.8

Comparison of SII-MPQ Bivariate Correlations $\geq .25$ within the Realistic Domain for Larson and Borgen (2002) and Staggs et al. (2003)

SII Scale	MPQ Scale	Larson & Borgen (2002)	Staggs et al. (2003)
R	Harm Avoidance	-37	-51*
Mechan Act.	Harm Avoidance	-33	-48*
Agriculture	Harm Avoidance	-25	-29
Military Act.	Harm Avoidance	-24	-28
R	CT	-21	-39*
Mechan Act.	CT	-17	-25
R	Achievement	10	27*
Mechan Act.	Achievement	12	27*
Agriculture	PA	09	25*
Athletics	PA	--	25
Athletics	Social Potency	--	26
Nature	Absorption	33	18*

Note. Decimals omitted. For the SII GOTs and the MPQ higher-order factors, scale names are abbreviated: R = Realistic; CT = Constraint; PA = Positive Affectivity. Correlations $\geq .25$ in both studies are shaded. The stronger of the two correlations is in bold print. Correlation differences $>.10$ are marked with an asterisk (*). Correlations not available due to changes from the 1985 to the 1994 SII are marked with dashes (--).

Aside from the negative correlations of several Realistic scales with Harm Avoidance, the MPQ primary factor, Achievement, also correlated meaningfully with the Realistic GOT (.27) and the Mechanical Activities BIS (.27) for Staggs et al. (2003); for Larson and Borgen (2002), however, these correlations were relatively weak (i.e., .10, .12). Similarly, the Agriculture BIS correlated .25 with the MPQ higher-order factor, Positive Affectivity (PA), in the college sample, but only .09 in the gifted adolescent sample. The only correlation involving a Realistic interest scale that was stronger for Larson and Borgen than for Staggs et al. was the correlation between the Nature BIS and the Absorption primary scale (.33 vs. .18). Finally, the Athletics BIS correlated .25 with PA and .26 with

Social Potency in Staggs et al., but values were not available from Larson and Borgen due to changes from the 1985 to the 1994 versions of the SII.

Correlations with the Investigative GOT and BISs. Table 1.9 (below) lists simple bivariate correlations involving Investigative scales that were meaningful ($r \geq .25$) in either the Larson and Borgen (2002) gifted adolescent sample or the Staggs et al. (2003) college sample. Five correlations were meaningful in both studies, and these correlations involved three MPQ scales: the primary factor, Harm Avoidance; the higher-order factor, Positive Affectivity (PA); and the PA-affiliated primary factor, Achievement. (When not otherwise specified, the Larson and Borgen correlation is listed first, followed by the Staggs et al. correlation.) The Investigative GOT correlated similarly with Achievement across the two studies (.34, .33). Achievement also correlated strongly with the Science BIS (.34) and the Math BIS (.36) in the college student sample, and slightly less substantially in the gifted adolescent sample (.29, .21, respectively). In addition, the MPQ higher-order factor PA correlated similarly with the Investigative GOT in the two samples (.29, .27). Also similar were the negative correlations for Harm Avoidance with the Investigative GOT (-.29, -.25) and with the Science BIS (-.31, -.30). The difference across the two studies in the correlation between the Math BIS and Harm Avoidance is marked, with a strong -.39 correlation for the college sample, compared with a weak -.08 correlation for the gifted adolescent sample. The similarity (in both studies) in the way the Realistic and Investigative domains correlated with MPQ scales is notable, and provides support for the adjacent positions of the R and I themes in the Holland hexagon.

Table 1.9

Comparison of SII-MPQ Bivariate Correlations $\geq .25$ within the Investigative Domain for Larson and Borgen (2002) and Staggs et al. (2003)

SII Scale	MPQ Scale	Larson & Borgen (2002)	Staggs et al. (2003)
I	Achievement	34	33
Science	Achievement	29	34
Mathematics	Achievement	21	36*
I	Harm Avoidance	-29	-25
Science	Harm Avoidance	-31	-30
Mathematics	Harm Avoidance	-08	-39*
I	PA	29	27

Note. Decimals omitted. For the SII GOTs and the MPQ higher-order factors, scale names are abbreviated: I = Investigative; PA = Positive Affectivity. Correlations $\geq .25$ in both studies are shaded. The stronger of the two correlations is in bold print. Correlation differences $>.10$ are marked with an asterisk (*). Correlations not available due to changes from the 1985 to the 1994 SII are marked with dashes (--).

Correlations with the Artistic GOT and BISs. Table 1.10 (below) lists simple bivariate correlations (r s) involving Artistic scales that were meaningful ($\geq .25$) in either the Larson and Borgen (2002) gifted adolescent sample or the Staggs et al. (2003) college sample. Four correlations were $\geq .25$ or greater in both studies, and all involved one MPQ primary factor—Absorption. The correlations between Artistic interest scales and Absorption were generally somewhat stronger for the gifted adolescent sample than for the college sample, although all were meaningful at $r \geq .25$. In both studies (with correlations from Larson and Borgen listed first), Absorption correlated meaningfully with the Artistic GOT (.55, .43), as well as with three BISs—Music/Dramatics (.53, .40), Art (.45, .40), and Writing (.45, .36). In addition, Absorption correlated .39 with Applied Arts (a BIS new to the 1994 SII) in the Staggs et al. study. The correlations between Artistic scales and Absorption were the strongest interest-personality correlations reported by Larson and Borgen, and were second in strength only to negative correlations between Harm Avoidance and Realistic interest scales in the Staggs et al. study (See Table 1.8 above). In addition to correlations with Absorption, Culinary Arts (a new BIS in the 1994 SII) also correlated meaningfully with Well-Being (.26), an MPQ primary factor affiliated with Positive Affectivity (PA), in the Staggs et al. college sample. Finally, a

substantial discrepancy occurred across the two studies in the correlation between the Music/Dramatics BIS and PA—with a meaningful .27 correlation in the gifted adolescent sample, compared with a mere .08 correlation in the college sample.

Table 1.10

Comparison of SII-MPQ Bivariate Correlations $\geq .25$ within the Artistic Domain for Larson and Borgen (2002) and Staggs et al. (2003)

SII Scale	MPQ Scale	Larson & Borgen (2002)	Staggs et al. (2003)
A	Absorption	55	43*
Music/Drama	Absorption	53	40*
Art	Absorption	45	40
Applied Arts	Absorption	--	39
Writing	Absorption	45	36
Music/Drama	PA	27	08*
Culinary Arts	Well-Being	--	26

Note. Decimals omitted. For the SII GOTs and the MPQ higher-order factors, scale names are abbreviated: A = Artistic; PA = Positive Affectivity. Correlations $\geq .25$ in both studies are shaded. The stronger of the two correlations is in bold print. Correlation differences $>.10$ are marked with an asterisk (*). Correlations not available due to changes from the 1985 to the 1994 SII are marked with dashes (--).

Correlations with the Social GOT and BISs. Table 1.11 (below) lists simple bivariate correlations (*rs*) involving SII scales from the Social domain that were meaningful ($\geq .25$) in either the Larson and Borgen (2002) gifted adolescent sample or the Staggs et al. (2003) college sample. Three correlations were .25 or greater in both studies (with correlations from Larson and Borgen listed first): the Religious BIS with Traditionalism (.45, .30); the Social GOT with Well-Being (.33, .25); and the Social GOT with Social Closeness (.27, .26). Traditionalism is a primary scale affiliated with the higher-order factor Constraint (CT). Well-Being and Social Closeness are primary factors affiliated with the higher-order factor Positive Affectivity (PA). In the Staggs et al. sample, Traditionalism also shared meaningful overlap with the Social GOT (.25), and Social Closeness also correlated with the Social Service BIS (.25); these values were slightly weaker in the Larson and

Borgen sample (.23 and .21, respectively). The remaining six correlations were stronger in the adolescent sample (listed first) than in the college sample (listed second): PA with the Social GOT (.41, .21); PA with the Social Service BIS (.32, .21); PA with the Teaching BIS (.25, .16); the Religious Activities BIS with CT (.32, .19); and Religious Activities with two primary factors affiliated with NA—Aggression (-.28, -.17) and Stress Reaction (-.28, .07). The correlations between Religious Activities and Stress Reaction in the two studies are particularly noteworthy for the wide difference between them.

Table 1.11

Comparison of SII-MPQ Bivariate Correlations $\geq .25$ within the Social Domain for Larson and Borgen (2002) and Staggs et al. (2003)

SII Scale	MPQ Scale	Larson & Borgen (2002)	Staggs et al. (2003)
Religious	Traditionalism	45	30*
S	Traditionalism	23	25
S	Well-Being	33	25
S	Social Closeness	27	26
Social Service	Social Closeness	21	25
S	PA	41	21*
Social Service	PA	32	21*
Teaching	PA	25	16
Religious	CT	32	19*
Religious	Aggression	-28	-17*
Religious	Stress Reaction	-28	07*

Note. Decimals omitted. For the SII GOTs and the MPQ higher-order factors, scale names are abbreviated: S = Social; PA = Positive Affectivity; CT = Constraint. Correlations $\geq .25$ in both studies are shaded. The stronger of the two correlations is in bold print. Correlation differences $>.10$ are marked with an asterisk (*). Correlations not available due to changes from the 1985 to the 1994 SII are marked with dashes (--).

Correlations with the Enterprising GOT and BISs. Table 1.12 (following page) lists simple bivariate correlations (*rs*) involving Enterprising scales that were meaningful ($\geq .25$) in either the Larson and Borgen (2002) gifted adolescent sample or the Staggs et al. (2003) college sample. Six correlations were .25 or greater in both studies—all of which involved the MPQ higher-order factor Positive Affectivity (PA) or the PA-affiliated primary factor Social Potency. For these six correlations, the relations were stronger for the gifted adolescent sample (listed first) than for the college sample (listed second). Social Potency was clearly most robustly correlated with Enterprising scales, and it correlated meaningfully in both studies with the Public Speaking BIS (.48, .39), the Enterprising GOT (.36, .27), the Organizational Management BIS (.35, .28), and the Sales BIS (.28, .27). In addition, Social Potency correlated meaningfully with the remaining two Enterprising BISs—Law/Politics (.45) and Merchandising (.30)—in the gifted adolescent sample, although these correlations were weaker in the college sample (.22, .20, respectively). Three of the remaining correlations listed in Table 1.12 involve the MPQ higher-order factor Positive Affectivity (PA). Although PA correlated $\geq .25$ with the Enterprising GOT and with the Public Speaking and Law/Politics BISs in one or both of the studies, these correlations were weaker than the correlations between the PA-affiliated primary factor Social Potency with the respective SII Scales. Finally, Social Closeness, another MPQ primary factor affiliated with PA, correlated meaningfully with the Enterprising GOT and the Sales BIS in the college sample, but not in the adolescent sample. (See Table 1.12 for exact values.)

Table 1.12

Comparison of SII-MPQ Bivariate Correlations $\geq .25$ within the Enterprising Domain for Larson & Borgen (2002) and Staggs et al. (2003)

SII Scale	MPQ Scale	Larson & Borgen (2002)	Staggs et al. (2003)
Public Speaking	Social Potency	48	39
E	Social Potency	36	27
Organiz Mgmt	Social Potency	35	28
Sales	Social Potency	28	27
Public Speaking	PA	36	26*
Organiz Mgmt	PA	29	25
Law/Politics	Social Potency	45	22*
Merchandising	Social Potency	30	20*
E	PA	29	23
Law/Politics	PA	27	20
E	Social Closeness	14	25*
Sales	Social Closeness	11	26*

Note. Decimals omitted. For the SII GOTs and the MPQ higher-order factors, scale names are abbreviated: E = Enterprising; PA = Positive Affectivity. Correlations $\geq .25$ in both studies are shaded. The stronger of the two correlations is in bold print. Correlation differences $>.10$ are marked with an asterisk (*). Correlations not available due to changes from the 1985 to the 1994 SII are marked with dashes (--).

Correlations with the Conventional GOT and BISs. Neither Larson and Borgen (2002) nor Staggs et al. (2003) reported any correlations (r_s) $\geq .25$ between Conventional interest scales and MPQ factors. For Staggs et al., the strongest correlations within the Conventional domain were Office Services with Constraint (.19) and Computer Activities with Harm Avoidance (-.19). The strongest correlations with Conventional scales reported by Larson and Borgen were Office Services with Harm Avoidance (.19), and the Conventional GOT with Positive Affectivity (.19). The opposite trend in the correlations between Conventional BISs with Harm Avoidance is noteworthy, indicating that those expressing interests in Computer Activities may, on average, be notably different in personality than those reporting interests in more general Office Services.

Summary and Synthesis of Meaningful Interest-MPQ Correlates

Based on convergent meaningful correlations found by Staggs et al. (2003) and Larson and Borgen (2003) regarding overlap of interests with specific personality dimensions, at least seven MPQ primary factors seem to be meaningfully related to expressions of interest—Absorption, Social Potency, Harm Avoidance, Achievement, Traditionalism, Well-Being, and Social Closeness. Findings from related MPQ studies are incorporated in the summary below, which is organized by MPQ dimension.

Absorption (ABS). For both Larson and Borgen (2002) and Staggs et al. (2003), the strongest group of correlations involved the robust positive relations between Absorption (ABS) with the Artistic GOT (.55, .43, respectively) and with four Artistic BISs (r s ranging from .36 to .53). These results are consistent with those of Blake and Sackett (1999), who reported a .37 correlation between ABS and the Artistic GOT. Although he did not emphasize them in his discussion, Morfitt (1998) similarly found substantial correlations between ABS and the Artistic GOT and BISs, which were all above .24 (r s ranging from .27 to .47) except for Writing in men ($r = .18$).

Waller et al.'s (1995) findings for correlations between MPQ scales and non-SII interest scales are somewhat discrepant in that the correlations between ABS and three Artistic-related interest scales were somewhat weaker than other personality-interest correlations in their study, and were also weaker than the comparable correlations found by Larson and Borgen (2002) and Staggs et al. (2003). Specifically, ABS correlated modestly with Writer (.16), Arts & Crafts (.16), and Performing Arts (.22) in the Waller et al. study. The strongest correlation Waller et al. reported with an Artistic-related interest scale was the negative correlation between Writer and Traditionalism (-.27).

Social Potency (SP). Based on findings of Larson and Borgen (2002) and Staggs et al. (2003), Social Potency (SP) appears to be substantially related to Enterprising interests. This finding is consistent with the results of Blake and Sackett (1999), who reported a .32 correlation between SP and the Enterprising GOT, and is also consistent with the comparable correlations reported by Waller et al. (1995), who reported meaningful correlations between SP and three non-SII occupational interest scales: Politics (.46), Law (.37), and Sales (.30). In both the Larson and Borgen and Staggs et al. studies, SP correlated meaningfully with the Enterprising GOT (.27, .36) and with three Enterprising BISs—Public Speaking (.39, .48), Organizational Management (.28, .35), and Sales (.27, .28). In addition, Social Potency correlated substantially with the remaining two Enterprising BISs—Law/Politics (.45) and Merchandising (.30)—in the Larson and Borgen sample, although these correlations were slightly weaker in the Staggs et al. sample (.22, .20, respectively).

Morfitt (1998) similarly reported that his most notable correlations (r s ranging from .29 to .57) were those between SP and the BISs associated with business activities (i.e., Public Speaking, Law/Politics, Merchandising, Sales, and Business Management). For Larson and Borgen (2002), the correlations between SP and Enterprising interest scales were the second strongest cluster of personality-interest correlations in their study after the cluster of substantial correlations between ABS and Artistic interest scales.

In addition to the correlations between SP and Enterprising-type interest scales, Waller et al. (1995) reported a meaningful negative correlation (-.26) between SP and their Numbers scale (i.e., bookkeeping, accounting, auditing)—an interest scale that corresponds with Conventional-type interests on the SII. In contrast, neither Larson and Borgen (2002) nor Staggs et al. (2003) reported any meaningful correlations between SP and the Conventional GOT or BISs within the Conventional domain (strongest $r = .12$).

Harm Avoidance (HA). Those who express the opposite of Harm Avoidance (HA) may generally prefer vocational pursuits within the Realistic (R) and Investigative (I) domains—specifically Mechanical Activities (R), Agriculture (R), and Science (I). In Larson and Borgen (2002) and Staggs et al. (2003), the correlations between HA and the Realistic GOT, the Mechanical Activities BIS, and the Agriculture BIS ranged from -.25 to -.51; and correlations between HA with the Investigative GOT and the Science BIS ranged from -.25 to -.31 (See Tables 1.8 and 1.9 above). Aside from indication in Waller et al.'s (1995) study that HA may be negatively correlated with occupational interests related to Realistic and Investigative GOTs (i.e., $r = -.25$ for HA with Blue Collar; $r = -.38$ for HA with Explorer-Scientist), it appears that these new findings emphasized by Staggs et al. had not been hypothesized in any previously published vocational literature.

The substantial correlations between HA and the Realistic GOT are particularly noteworthy given that previous FFM research on the convergence of interests and personality had not reported any substantial interest-personality correlations involving Realistic scales. Aside from the relation between Artistic interests and Absorption, the negative correlations between Realistic scales and HA formed the most substantial cluster of correlations in the Staggs et al. (2003) study. Larson and Borgen (2002) and Morfitt (1998) had similarly emphasized the substantial negative correlations they found between HA and the Adventure BIS on the 1985 version of the SII (-.62 and -.55, respectively). As a further testament to the shared underlying dimension indicated by these correlations, the Adventure BIS was shifted from a Realistic Basic Interest Scale to one of four Personal Style Scales in the 1994 Strong.

The finding regarding the vocational pursuit of Science as an expression of risk-taking and excitement-seeking in one's personality was also a relatively new and intriguing idea. As previously noted, Larson and Borgen (2002) did not anticipate the unique contribution of HA in the prediction of the Science BIS. Staggs et al. (2003) and Larson and Borgen reported similar correlations between HA and the Science BIS (-.30 and -.31, respectively), and between HA and the Investigative GOT (-.25 and -.29, respectively). An interesting difference in the cluster of correlations between HA and interest scales in the Investigative domain was the -.29 correlation between HA and the Mathematics BIS in the Staggs et al. college sample, compared with only a -.08 correlation in Larson and Borgen's gifted adolescent sample. Also noteworthy is the finding that the third Investigative BIS, Medical Science, correlated with HA quite differently in the Staggs et al. study (.03) than in the Larson and Borgen study (-.20).

In addition to the connection between HA and certain Realistic and Investigative-type occupational interest scales, Waller et al. (1995) reported a .31 correlation between HA and Numbers—an interest scale that is reflective of Conventional-type interests. Although neither Staggs et al. (2003) nor Larson and Borgen (2002) reported substantial correlations between HA and the Conventional GOT (.04 and .05, respectively), they did each report a modest correlation between HA and the Office Services BIS (.17 and .19, respectively).

Achievement (ACH). Both Larson and Borgen (2002) and Staggs et al. (2003) reported a substantial correlation between Achievement (ACH) and the Investigative GOT (.34 and .33, respectively), as well as between ACH and one Investigative BIS—Science (.29, .34, respectively). This relation was not previously suggested by Blake and Sackett (1999) nor Waller et al. (1995), nor emphasized by Morfitt (1998) in the discussion of his findings. A notable difference in the findings of Staggs et al. and Larson and Borgen was the correlation between ACH and the Medical Science BIS, which was -.31 for Larson and Borgen versus .18 for Staggs et al.

Traditionalism (TRA). The idea that those who identify Traditional preferences often express interests in Religious Activities was supported by both Larson and Borgen (2002) and Staggs et al. (2003). The simple correlations between TRA and the Religious Activities BIS were .30 for Staggs et al. and .45 for Larson and Borgen. This correlation was not emphasized by Morfitt (1998) or Blake and Sackett (1999), but was suggested in Waller et al. (1995) by the .26 correlation between TRA and the Religion occupational interest scale. Although these specific correlations are meaningful, they do not represent part of a larger cluster of correlations between TRA and other Social BISs.

In the Waller et al. (1995) study, TRA was also meaningfully correlated with the Explorer-Scientist scale (-.27). However, no meaningful correlations between TRA and the Investigative GOT or any of the Investigative BISs were identified by Staggs et al. (2003) or Larson and Borgen (2002).

Well-Being (WB). Both Larson and Borgen (2002) and Staggs et al. (2003) reported a meaningful correlation between Well-Being (WB) and the Social GOT (.33 and .25, respectively). The WB-Social correlation is somewhat different from many of those discussed above in that the correlation with the GOT is stronger than that with any of the specific BISs within the Social domain. A connection between WB and the Social GOT was not suggested or emphasized by Blake and Sackett (1999), Waller et al. (1995), or Morfitt (1998). Instead, Blake and Sackett (1999) selected Social Potency as the MPQ scale they expected to be most strongly correlated with the Social GOT (.20).

Social Closeness (SC). Given that vocational theorists have described interest in Mechanical Activities (and other Realistic BISs) as a preference for working with objects more than with people, Larson and Borgen (2002) hypothesized that interest in Mechanical Activities would be inversely associated with SC, and a finding of Waller et al. (1995) similarly suggested a negative correlation between SC and certain Realistic interests (i.e., $r = -.25$ between SC and the Blue Collar occupational interest scale). The relation between SC and the Mechanical Activities BIS was not, however, indicated as meaningful by Staggs et al. (2003) or Larson and Borgen (2002), although a modest relation did exist (-.23 and -.15, respectively).

Social Closeness did, however, have a meaningful positive correlation with the Social GOT in both the Staggs et al. (2003) college sample and the Larson and Borgen (2002) gifted adolescent sample (.26 and .27, respectively). In the gifted adolescent sample, this correlation appeared to represent a broader, more general connection between Positive Affectivity (PA) and Social interests. The correlations between the Social GOT and each of the PA-affiliated MPQ primary factors (WB, SP, ACH, SC) ranged from .24 to .33, and the strongest correlation in this cross-domain cluster was the one between the MPQ higher-order factor PA and the Social GOT (.41). Morfitt (1998) similarly reported substantial correlations between PA and the Social GOT (.30 females, .32 males). In the Larson and Borgen sample, PA also correlated meaningfully with the Social Service BIS (.32) and the Teaching BIS (.25).

In Staggs et al. (2003), however, the correlation between PA and the Social GOT was only .21, and the correlations of the Social GOT with PA-affiliated primary scales were as follows: .25 with Well-Being; .07 with Social Potency; .02 with Achievement; and .26 with Social Closeness (SC). In the Staggs et al. college sample, meaningful correlations between Social interest scales and

PA-affiliated primary scales of the MPQ were generally specific to correlations involving Well-Being and SC of the MPQ with the Social GOT and a couple of specific Social BISs of the SII (See Table 1.11 above). In sum, the strong higher-order correlation between the Social GOT and the MPQ higher-order factor Positive Affectivity (PA) indicated in Larson and Borgen's study was considerably weaker in the Staggs et al. study, in which the strongest correlations between these two domains were instead the correlations involving the lower-order (i.e., primary) scales of the MPQ.

Higher-order factors (PA, NA, CT). Regarding correlations found to be meaningful by both Larson and Borgen (2002) and Staggs et al. (2003) between interest scales and MPQ higher-order factors (i.e., Positive Affectivity, Negative Affectivity, and Constraint), PA was positively correlated with the Investigative GOT (.29 and .27, respectively) and two Enterprising BISs—Public Speaking (.36, .26) and Organizational Management (.29, .25). As noted above, PA did not correlate as strongly with these interest scales as did the PA-affiliated primary factors of Achievement and Social Potency. (See Tables 1.09 and 1.12 above for exact values). A notable difference between the two studies involved the correlations reported between PA and the Social GOT: Larson and Borgen reported a considerably stronger correlation (.41) than that found by Staggs et al. (.21).

The higher-order factor Constraint (CT) correlated inversely with the Realistic GOT and the Mechanical Activities BIS in the Staggs et al. (2003) study, but did not predict as much variation in those interest scales as did the CT-affiliated primary factor Harm Avoidance. Furthermore, the correlations with CT were not $\geq .25$ in the Larson and Borgen (2002) study. (See Table 1.08 above.)

The third MPQ higher-order factor, Negative Affectivity (NA), was particularly noteworthy for not correlating above .10 with any interest scales in Staggs et al. (2003), and with only two interest scales in Larson and Borgen (2002)—namely, .12 with the Enterprising GOT and .15 with the Artistic GOT. These findings are consistent with Blake and Sackett (1999), Waller et al. (1995), and Morfitt (1998). Thus, it appears from individual studies that NA relates minimally to vocational interests in general.

Discrepancies among findings. The above discussion reveals that, in spite of considerable agreement across recent studies, a number of discrepancies also exist and warrant further investigation. Several correlation differences were quite substantial between Larson and Borgen (2002) and Staggs et al. (2003). Some examples of the 24 correlations that differed by .10 or more across these two studies include Achievement with the Realistic GOT (.10, .27), Harm Avoidance with the Mathematics BIS (-.08, -.39), PA with the Music/Dramatics BIS (.08, .27), Stress Reaction with the Religious Activities BIS (.07, -.28), Social Potency with the Law/Politics BIS (.22, .45), and PA with the Social GOT (.41, .21). In the discussion of their results, Staggs et al. speculate about the

influence of several apparent gender-based personality differences in their sample that may have influenced these differences. Differences between the college student and gifted adolescent samples may also have influenced the results.

Furthermore, a number of relations were posited or supported by Blake and Sackett (1999), Waller et al. (1995), or Morfitt (1998) that were not indicated as meaningful by the combined results of Larson and Borgen (2002) and Staggs et al. (2003). Several of these proposed relations involve Conventional interests. The findings of Waller et al. suggested a positive correlation between certain Conventional-type interests and Harm Avoidance, and a negative correlation between Conventional-type interests and Social Potency. Blake and Sackett also suggested a correlation between the Conventional GOT and Control (.22). However, none of these correlations were indicated as meaningful by the combined results of Staggs et al. (2003) and Larson and Borgen (2002). One of three main correlations Morfitt emphasized in the discussion of his results was the correlation he found between the Conventional GOT and the MPQ higher-order factor, Constraint (.27). This correlation was only modest in the studies conducted by Larson and Borgen (.13) and Staggs et al. (.09), and was particularly weak in comparison with other more substantial interest-personality correlations.

Other discrepancies across studies in proposed MPQ/interest scale correlations involve Artistic interests, the MPQ higher-order scale Constraint (CT), and CT-affiliated primary factors of Traditionalism and Control. Morfitt (1998) reported a meaningful negative correlation between CT and the Artistic GOT ($r = -.28$) for men in his sample. Blake and Sackett (1999) similarly proposed an inverse correlation between MPQ primary factor Control and the Artistic GOT—but the actual correlation reported was modest (-.16). In addition, Waller et al. (1995) reported a meaningful negative correlation between Traditionalism and their Writer scale (-.27). However, with the exception of a .17 correlation between Traditionalism and the Culinary BIS for Staggs et al. (2003), the correlations between the Artistic GOT and all the Artistic BISs with the three MPQ scales mentioned above—Constraint, Control, and Traditionalism—were mostly negative and all less than .15 in both Larson and Borgen (2002) and Staggs et al. (2003).

Additional divergence in findings involves the MPQ Aggression and Stress Reaction scales. Larson and Borgen (2002) found substantial negative correlations between the Religious Activities BIS with Stress Reaction (-.28) and Aggression (-.28). Similarly, Waller et al. (1995) reported an inverse relation between Aggression and their Religious occupational interest scale (-.25). However, the correlations of the Religious Activities BIS with Stress Reaction and Aggression were

considerably weaker in the Staggs et al. (2003) sample (.07 and -.17, respectively) than in the Larson and Borgen sample (-.28, -.28, respectively).

Finally, Morfitt (1998) reported a substantial correlation between PA and the Enterprising GOT (.32 for females and males), as well as between PA and the Social GOT (.30 F, .32 M). As discussed above, Social Potency was more strongly correlated with Enterprising scales than was PA in both Staggs et al. (2003) and Larson and Borgen (2002). In Larson and Borgen's sample, however, PA was meaningfully correlated with both the Social GOT (.41) and the Enterprising GOT (.29), but was more strongly correlated with Social. On the other hand, both correlations were less substantial in the Staggs et al. sample, but the correlation between PA and Enterprising (.23) was slightly stronger than the correlation between PA and Social (.21). The nature and distinction of correlations between PA and the Social and Enterprising themes is an area that warrants further clarification.

Examination of findings across these studies suggests that differences in the demographics (i.e., age, employed vs. student, IQ) of the samples might be cause for differences in findings. It is also noteworthy that both Larson and Borgen (2002) and Staggs et al. (2003) found substantial support for several strong links of interests with MPQ personality factors beyond the two emphasized by Waller et al. (1995; i.e., Social Potency and Harm Avoidance); however, the three studies did produce many similar correlations, which is especially meaningful given the alternative nature of Waller et al.'s use of non-RIASEC interest scales.

Summary of I-P Empirical Studies

In sum, the number of meaningful interest-personality correlations found in the empirical studies that incorporated the MPQ as an alternative measure of personality is a notable increase over the number reported in studies using only measures of FFM traits and RIASEC themes. The use of more specific scales for measuring both interests and personality has advanced understanding of these constructs and provided greater clarification of interest-personality convergence beyond that indicated by five broad personality factors and six broad interest domains. Although the existing studies using the MPQ and the SII have yielded considerable agreement about several major correlations between personality and interest scales, a considerable number of noteworthy discrepancies also have been indicated. Thus, the substantial amount of published and unpublished MPQ/SII data warrants the kind of synthesis and analysis that was contributed by Larson et al.'s (2002) and Barrick et al.'s (2003) meta-analyses of FFM/SII studies. Meta-analyses of the existing MPQ/SII studies would contribute more precise estimates of effect sizes and would allow conclusions to be drawn across a large sample and a wide range of demographic variables.

The Present Study

The primary objective of the present study was to use meta-analytic techniques to synthesize data on I-P convergence from recent SII/MPQ studies, and in this manner advance general understanding of linkages between the domains of interest and personality. As revealed by the examination of results across several existing MPQ/SII studies, some conclusions about the strengths and loci of interest-personality linkages have been similar, and others divergent. Possible explanations for these differences could include variation in the testing environment, or in the sex, age, and intelligence of the participants. Thus, the present meta-analyses aimed to draw conclusions across studies, and also provided an ample sample size for examining the specific influence of sex and age as possible moderating variables.

Another goal of the meta-analyses was to solidify and clarify recent findings from RIASEC/MPQ studies regarding interest-personality links that were not identified by RIASEC/FFM studies. Individual studies using the MPQ have revealed substantial loci of overlap (e.g., the negative correlation between Harm Avoidance and Realistic interests) that were not identified by the Big 5/Big 6 meta-analyses. The present study furthers knowledge of interest-personality overlap by integrating findings from studies that used the MPQ as an alternative to the FFM as a measure of personality. In pursuit of the above objectives, the present study aimed to clarify areas of both convergence and divergence between specific domains of interest and personality. As emphasized by Larson et al. (2002), both types of knowledge are important for career counseling. For example, a previous FFM study (Blake & Sackett, 1999) suggested a meaningful link between the Conventional interest construct and the Conscientious personality type, but Larson et al.'s (2002) meta-analyses did not support this link. For applied purposes, it is important for career counselors to be aware of the variety of interest preferences that are possible for varying personality types, and it is helpful for them to be aware of strong I-P linkages found in group research that might fit for specific individuals.

A final aim of this study was to integrate findings with proposed models and theories regarding the nature of shared dimensions underlying personality and interests, and regarding the causal order of development and expression of both domains. A goal for the present study was to contribute data valuable for evaluating and refining proposed hypotheses and models of this nature, as discussed by authors such as Betsworth et al., 1994; Waller et al., 1995; Ackerman and Heggstad, 1997; Swanson, 1999; Larson and Borgen, 2002; and Mount et al., 2004. Perhaps interests and personality are largely separate constructs and genetic in nature (e.g., Waller et al.). Perhaps interests and personality develop in tandem and are equally fundamental to one's person, but personality and other factors (e.g., ability) continue to shape interests over time (e.g., Lent et al., 1994; Swanson &

Gore, 2000). Or perhaps interests are a “surface” expression of more fundamental personality traits (e.g., Kuhl, 1985; 1987; Corno & Kanfer, 1993). Data from this study is hoped to contribute to broader understanding of the nature, development, and expression of interest and personality domains.

II. METHOD

Literature Search Procedure

An exhaustive search of the literature was conducted in order to identify published and unpublished studies in which participants' vocational interests were measured according to Holland's RIASEC model, and participants' personality traits were measured using the Multidimensional Personality Questionnaire (MPQ; Tellegen, 1982; Tellegen & Waller, in press). The primary computer search was conducted through PsychLit and ERIC databases (no restrictions) using keywords *MPQ* and *Multidimensional Personality Questionnaire*. Each title and abstract of the identified MPQ studies ($n = 163$) was examined in order to identify studies that administered both the MPQ and an interest measure. A second computer search was conducted of PsychLit and ERIC databases using the pairing of keywords for interests, vocation, and personality (i.e., *int** and *personal**). In this manner, all studies including pairings of any form of these key words were identified. This list of studies was reviewed in order to identify any studies possibly missed in the initial search. In addition, reference lists in relevant review articles, chapters, and books were reviewed.

As a result of these searches, in addition to attaining a recent unpublished raw data sample (i.e., Larson, 2003), a total of eight studies was identified for possible inclusion—three published journal articles, three dissertations, one conference paper, and one unpublished raw data set. One relevant study, the 1995 book chapter by Waller, et al. (discussed previously in this document) was excluded because the authors developed a unique occupational interest measure in which scales were not connected directly with Holland's code types. All the studies located that reported administration of the MPQ and a RIASEC interest measure had administered the Strong Interest Inventory (SII) specifically—either the 1985 (Hansen & Campbell) or the 1994 (Harmon et al.) version. Thus, the studies were homogeneous in terms of the interest measure administered.

Excluded Studies

Several of the studies (i.e., Heiss, 1995; Blake & Sackett, 1999; Losoff, 2000) reported administration of the MPQ and the SII, but did not provide complete correlation matrices for the two groups of scales. Thus, the final step was to attempt contact with these authors and request the desired data. Successful contact was made with Sackett and with Heiss, but not with Losoff. Neither Sackett nor Heiss was able to supply complete correlation data. However, examination of the data and discussion with authors revealed that each of these three studies reported data from the same data pool as another of the studies that had been identified. This overlap in samples is explained below in

the section, *Description of Included Studies*. In order to avoid such overlap, correlation data from 37 participants were sacrificed by excluding these three studies, and bias that would have resulted in the meta-analyses by including the same data more than once was avoided. The three excluded studies are listed below in Table 2.1. Explication of the overlapping data pools is provided in the final column of Table 2.1, as well as in the discussion of included studies that follows.

Table 2.1
Studies Excluded from the Meta-Analyses

Citation	N (F, M)	Sample Description	SII Form	Reasons for Exclusion
Heiss, 1995 <i>Dissertation</i>	331 (127, 204)	Gifted adolescents. Mean age not reported.	1985	Same data pool as Schmidt, 1998; complete correlation matrices not attainable.
Blake & Sackett, 1999 <i>Published article, Study 2</i>	457 (206, 251)	Adult career clients. Age range 18-65. Mean age: M = 34.3; F = 33.2.	1985	Same data pool as Morfitt, 1998; complete correlation matrices not attainable.
Losoff, 2000 <i>Dissertation</i>	199 (104, 95)	Adult career clients. Mean age = 34.1.	1985	Same data pool as Morfitt, 1998; complete correlation matrices not attainable.

Included Studies

A total of five studies was retained from the original eight studies identified. These five studies are listed in Table 2.2 below.

Table 2.2

Studies Included in the Meta-Analyses

Author(s)	N Tot	N M, F	Sample Description	SII Form
Morfitt, 1998 <i>Dissertation</i>	420	231, 189	Adult career clients; 75% in age range 29-48	1985
Schmidt, 1998 <i>Dissertation</i>	790	460, 324 6 unreported	Gifted adolescents; 7 th -10 th graders	1985 & 1994
Larson & Borgen, 2002 <i>Published article</i>	323	127, 197	Gifted adolescents; Mean age = 16.39	1985
Staggs, Larson, & Borgen, 2003 <i>Published article</i>	200	63, 137	College students; Mean age = 20.23; SD = 1.8	1994
Larson, 2003 <i>Unpublished data</i>	290	101, 185 4 unreported	College students; Mean age = 19.25; SD = 1.7	1994

Note. Studies that are listed in the table but not discussed in the previous literature review are studies that administered both the MPQ and the SII as part of their research, but convergence of interest and personality domains was not a focus of their report.

First, the Morfitt (1998) study reports data for 420 adult clients who sought vocational assessment and counseling services at the University of Minnesota's Vocational Assessment Clinic (beginning in 1985). This data pool is the same as that reported on by Blake and Sackett (1999; $n = 457$), as well as by Losoff (2000; $n = 99$). Although this researcher communicated with the individual authors and with the current director of the Minnesota clinic in an effort to clarify sample overlap and attain complete MPQ/SII correlation data for each individual study, these efforts were unsuccessful.

Consequently, the present meta-analyses included only the Morfitt study from among these three, as it was the only document providing a complete correlation matrix for MPQ scales with SII scales.

Although the Morfitt (1998) sample ($n = 420$) is slightly smaller than the Blake and Sackett sample ($n = 457$) and likely did not include more recent data available to Blake and Sackett (1999) and to Losoff (2000), the Morfitt sample appears to provide a reasonably good representation of the data set from the Minnesota Vocational Assessment Clinic. Data collection for this sample was reported to span years 1985-1995. Morfitt (1998) reported that the sample was 96% Caucasian, and that 75% of the clients were in the age range of 29-48. Specific percentages for other ethnic groups and the exact statistics for age (i.e., mean and standard deviation) were not reported. Participants were administered the 1985 SII.

Second, the Schmidt (1998) study reports data for 790 intellectually gifted adolescents identified by the Study of Mathematically Precocious Youth (SMPY) conducted by the Office of Precollegiate Programs for Talented and Gifted (OPPTAG) at Iowa State University (ISU). These students qualified for the OPPTAG program by meeting, at age 13, one of three scoring criteria on standardized tests: 1) scoring above 390 on the SAT-Mathematical; 2) scoring above 370 on the SAT-Verbal; 3) scoring at or above 20 on at least one American College Test (ACT) subtest. (On the SAT tests, scores range from 200 to 800; the ACT consists of four subtests: Math, Science Reasoning, English, and Reading, with scores ranging from 1 to 36 on each subtest.) According to Lubinski and Benbow (1992), these students represent approximately the top 1% of intellectual ability among students their age (as cited in Schmidt, 1998).

The MPQ and SII questionnaires were mailed to students, who completed them voluntarily before attending the OPPTAG summer program at ISU in the years 1992, 1993, 1994, 1995, and 1996. Data from this sample represents the same data pool discussed by Heiss (1995), although the Heiss sample represents less than half of the sample ($n = 331$) reported by Schmidt ($n = 790$). The Heiss dissertation also did not contain complete MPQ/SII correlation data, and this data was not attainable upon communication with the author. Thus, the Schmidt sample was chosen for inclusion in the present meta-analyses.

A limitation of the Schmidt (1998) sample was the lack of demographic data reported, as Schmidt did not report age or ethnicity for the sample, nor provide correlations for males and females separately. Thus, the best estimate for these variables is that provided by Heiss (1995), who reported that the gifted adolescents who participated in the program were in 7th-10th grade and were “predominantly White.” In the earlier years of data collection, participants were administered the

1985 SII, and in latter years, the 1994 SII. Thus, Schmidt reported correlation data for the 21 BISs shared in common by the 1985 SII and 1994 SII.

The third study, Larson and Borgen (2002), also reports data for intellectually gifted adolescents ($n = 323$). Larson and Borgen reported that these participants were predominantly White, with a mean age of 16.39. For data collection, gifted coordinators from all of the high schools in an upper Midwest state were contacted by the Counseling Psychology program in the Department of Educational Psychology at a large state university in the same state. The gifted coordinators were asked to nominate gifted juniors and seniors who would benefit from a career exploration workshop to be hosted at the university. These students were sent and asked to complete the SII (1985) and the MPQ (as well as the NEO-PI-R) in preparation for the workshops, at which time a vocational counselor was to discuss the results with them individually.

The Staggs, Larson, and Borgen (2003) study is one of two included studies that report data for college students. In this study, a sample of 200 students with an average age of 20.23 ($SD = 1.8$) was recruited from two undergraduate psychology courses at a large Midwest state university. These students were administered the MPQ and the 1994 SII at one of several evening sessions held during the Spring 2000 and Summer 2000 semesters. The students participated voluntarily and received course extra credit for their participation. The ethnicity of the majority of the students was Caucasian (78%), with Asian/Pacific Islanders forming the next largest ethnic group (11%). The participants represented seven different colleges within the university and 55 different majors.

Finally, the fifth study (Larson, 2003) also represents a sample of college students at a large Midwest state university. These participants were recruited from undergraduate psychology courses, and they received extra credit for their participation. The MPQ and the SII (1994) were administered to these students during the 2002-2003 academic year. The mean age of these students was 19.25 ($SD = 1.7$). The participants were predominantly Caucasian (84.5%), with each of the other ethnic groups representing between 1% and 3% of the total sample. Eight different colleges were represented, with the largest percentage of students representing the College of Liberal Arts and Sciences (28.5%).

Forms of the Strong Interest Inventory (SII)

Two samples were administered the 1985 SII, two samples were administered the 1994 SII, and one sample spanned administration of both the 1985 SII and the 1994 SII. With the 1994 revision of the SII, the total number of BISs increased from 23 to 25, with four new BISs added (i.e., Applied Arts, Culinary Arts, Computer Activities, and Data Management), one BIS dropped completely (i.e., Domestic Arts), one BIS dropped as a BIS and added as a Personal Style Scale (i.e., Adventure BIS to Risk Taking/Adventure PSS), and two BISs shifted to different General Occupational Themes (i.e.,

Medical Service was moved from Investigative to Social, and Athletics was moved from Social to Realistic). In addition, some items were changed within the existing scales in order to increase length and enhance reliability. Finally, the Business Management and Office Practices BISs were given the updated names of Organizational Management and Office Services, respectively.

In spite of these changes, Harmon et al. (1994) report that continuity with the 21 previous BISs was maintained between the 1985 and 1994 scales: All scores correlated above .94, with a median correlation of .987. Thus, analysis of the interest inventory as a possible moderator was not warranted in the present meta-analyses given the continuity between the 1984 SII and the 1994 SII. When viewing the results, however, it should be noted that the sample size is smaller for the four BISs that were new to the 1994 SII ($n = 490$ for Applied Arts, Culinary Arts, Computer Activities, and Data Management), and that these 490 individuals represent college students only (Staggs et al., 2003; Larson, 2003). In addition, data are not reported for the two BISs that were dropped in the 1994 version (i.e., Domestic Arts and Adventure). Finally, in instances of name changes, the updated 1994 names are used (i.e., Organizational Management and Office Services in place of Business Management and Office Practices, respectively).

Combined Sample Demographics

Age

Of the five studies included, two samples represent college students (combined $n = 490$), two samples represent gifted adolescents (combined $n = 1113$), and one sample represents adult career clients ($n = 420$). Thus, it is important to note that the gifted adolescents are more heavily represented than college students and working adults combined, and that analysis of age as a possible moderator is warranted. In spite of the larger number of gifted adolescents, the samples together represent a wide range of intellect and age. It is also important to note that age and intellectual ability are somewhat confounded in the present samples. This issue will be discussed further in subsequent sections.

Ethnicity

All samples were U.S. samples and predominantly White. Although precise percentages for racial/ethnic groups were not provided by several of the studies, the samples were generally 90% or more Caucasian. Of the samples that reported ethnicity, the Staggs et al. (2003) sample was the most diverse in that the Caucasian group comprised less than 90% of the total sample (i.e., 155 Caucasian (78%); 23 Asian or Pacific Islander (12%); 7 African American/Black; 7 "Other"; 6 Latino/Latina/Hispanic; and 1 Native American). Given the small numbers from non-Caucasian ethnic groups, multicultural generalizability from the results of the present meta-analyses is limited.

Analyses

Primary Meta-Analyses

Data were analyzed using the Biostat Comprehensive Meta Analysis computer program (Borenstein & Rothstein, 1999). This program was used to calculate mean effect sizes for correlations between MPQ and SII scales according to standard meta-analytic methods (Hedges & Olkin, 1985; Wang & Bushman, 1999). Although a sample size of five for both men and women is not *large* for meta-analysis, meta-analytic procedures can be successfully applied to a small number of studies (Rosenthal, 1995). Thus, 434 effect sizes were estimated for the 434 pairwise cross-correlations between 31 interest domains (SII: 6 GOTs and 25 BISs) and 14 personality dimensions (MPQ: 11 primary and 3 higher-order scales). Using the Biostat program, mean correlation estimates and 95% confidence intervals were calculated by first transforming each correlation to a Fisher's z , next calculating the mean for the z s, and finally transforming the mean z back to a mean r . Means were weighted by the sample size of each study, so that results for larger samples were weighted more heavily than results for smaller samples.

Meta-Analyses by Sex

Meta-analyses of the correlations between the 31 SII scales and the 14 MPQ scales were also run for the female and male samples separately. Separate correlations for the female and male samples were not attainable for the Schmidt (1998) sample of gifted adolescents; thus, the sex-specific meta-analyses were based on four of the five studies, for total sample sizes of 709 females and 521 males (1230 combined).

Analyses for Moderators

Sex. Analyses were conducted in order to assess the impact of sex as a moderating variable of interest-personality correlations. Using the Biostat program, Analysis of Variance (ANOVA) calculations were run, which provided estimates for the total variance for each effect, and partitioned the total variance to between- and within-groups sources of variance. Significance levels for the magnitude of between-sex variance were used to determine statistical significance of differences between females and males for each of the 434 pairwise correlations between interest (SII) and personality (MPQ) scales.

Age. Of the five samples included in the present study, two samples were comprised of college students (combined $n = 490$), two of gifted adolescents (combined $n = 1113$), and one of adult career clients ($n = 420$). Analysis of Variance (ANOVA) calculations were run to compare correlations across the three age groups. Significance levels for the magnitudes of between-group variance were used to determine statistical significance of age group differences for each of 84

pairwise correlations between SII GOTs (6) and MPQ personality scales (14). Because age as a moderator in interest-personality convergence has not been suggested or empirically investigated in any of the previous research reviewed, the decision was made to begin in the present study with broad interest domains (i.e., the six GOTs) rather than running the ANOVAs for all 434 correlations.

III. RESULTS

In this section, the primary meta-analyses of pairwise correlations between interest and personality scales are discussed first for the total sample, followed by the meta-analyses of correlations for females and males separately. Finally, analyses of two possibly moderating variables are reported—first for sex, and then for age.

Primary Meta-Analyses

Effect sizes were estimated for the 434 pairwise cross-correlations between 31 interest scales (SII: 6 GOTs and 25 BISSs) and 14 personality scales (MPQ: 11 primary and 3 higher-order scales). Table 3.1 (below) displays the meta-analytic results for the correlations between the 31 SII scales and the 14 MPQ scales for the total sample of 2023 individuals (982 F; 1032 M; 9 sex not reported). For each correlation in Table 3.1, the point estimate of the correlation (R) is listed first, followed by the lower (L) and upper (U) limits of the 95% confidence interval, and finally by the p -value (p). For each pairwise correlation, the p -value reflects the likelihood of the effect size equaling zero, such that for p -values $<.05$, there is less than 5% chance that the true correlation is zero.

Because p -values are heavily influenced by sample size, and because a correlation of .10 (i.e., 1% shared variance) is of little clinical interest even if the p -value is less than .05, the following discussion focuses on clinical meaningfulness instead of statistical significance. Thus, correlation estimates $r \geq .20$ (4% or more shared variance) are discussed as “meaningful,” with greatest emphasis on correlations .30 and greater (9% or more shared variance), which are considered “substantial.” These criterion are similar to criterion used by other meta-analyses of this type (e.g., Larson et al., 2002; Barrick et al., 2003). For the combined sample, a total of 49 of the 434 interest-personality correlations were meaningful at $r \geq .20$, and a total of 13 correlations were substantial at $r \geq .30$.

Table 3.1 *The Effect Size, Upper and Lower Limits, and p-value for Correlations between SII and MPQ Scales*

	PA				WB				SP				ACH				SC			
	<i>r</i>	L	U	<i>p</i>	<i>r</i>	L	U	<i>p</i>												
Realistic	10	06	14	<001	07	02	11	003	03	-01	08	149	12	08	16	<001	-13	-17	-08	<001
Agriculture	12	08	16	<001	13	09	18	<001	01	-04	05	802	08	03	12	001	01	-04	05	729
Nature	15	10	19	<001	16	11	20	<001	-01	-06	03	553	11	07	16	<001	01	-04	05	763
Military Act.	09	05	13	<001	04	00	09	054	10	06	15	<001	08	03	12	001	-09	-13	-05	<001
Athletics	24	20	28	<001	20	15	24	<001	20	16	24	<001	09	05	14	<001	21	17	25	<001
Mechanical Act.	06	01	10	014	03	-02	07	261	-01	-05	04	779	12	08	16	<001	-16	-20	-11	<001
Investigative	20	16	24	<001	12	08	16	<001	08	04	13	<001	27	22	31	<001	-03	-08	01	136
Science	10	05	14	<001	05	00	09	034	-02	-07	02	350	21	17	25	<001	-13	-17	-08	<001
Mathematics	12	08	16	<001	07	03	12	001	02	-02	07	320	22	18	26	<001	-03	-08	01	166
Medical Science	19	15	23	<001	12	07	16	<001	11	07	15	<001	18	14	22	<001	07	03	12	001
Artistic	17	13	21	<001	11	06	15	<001	11	06	15	<001	06	01	10	011	03	-01	08	147
Music/Dramatics	20	16	24	<001	13	08	17	<001	14	09	18	<001	05	01	09	030	09	05	14	<001
Art	11	07	16	<001	08	04	12	<001	04	-01	08	111	00	-04	05	911	03	-01	07	174
Applied Arts	14	06	23	002	08	-01	17	081	02	-07	11	660	05	-04	13	314	-06	-15	03	160
Writing	14	09	18	<001	07	02	11	002	10	06	15	<001	09	04	13	<001	-01	-05	04	690
Culinary Arts	21	12	29	<001	24	15	32	<001	08	-01	16	100	07	-02	15	147	19	11	28	<001
Social	31	27	35	<001	26	22	31	<001	17	13	22	<001	17	12	21	<001	29	25	33	<001
Teaching	21	17	26	<001	19	15	23	<001	09	05	13	<001	15	11	19	<001	18	14	22	<001
Social Service	24	20	28	<001	21	16	25	<001	13	09	18	<001	10	06	14	<001	26	22	30	<001
Medical Service	18	14	22	<001	14	10	19	<001	06	02	10	007	13	09	17	<001	13	09	18	<001
Religious Act.	16	12	21	<001	15	11	19	<001	02	-02	07	281	10	05	14	<001	12	08	17	<001
Enterprising	28	24	32	<001	17	13	21	<001	36	32	39	<001	09	04	13	<001	20	15	24	<001
Public Speaking	37	34	41	<001	19	15	23	<001	49	46	52	<001	18	13	22	<001	17	13	21	<001
Law/Politics	28	24	32	<001	11	07	15	<001	41	38	45	<001	17	12	21	<001	09	04	13	<001
Merchandising	22	18	26	<001	13	08	17	<001	29	25	33	<001	06	02	10	008	18	14	22	<001
Sales	19	15	23	<001	09	05	14	<001	29	25	33	<001	00	-04	04	995	17	12	21	<001
Organiz Mgmt.	29	25	33	<001	16	12	20	<001	35	31	39	<001	14	10	18	<001	16	12	21	<001
Conventional	15	11	19	<001	10	06	15	<001	09	04	13	<001	16	12	20	<001	06	02	10	006
Data Mgmt.	12	03	21	009	10	01	19	030	08	-01	17	074	11	02	20	016	-06	-14	03	220
Computer Act.	06	-03	15	213	05	-04	14	283	02	-07	11	601	05	-04	13	319	-08	-17	01	084
Office Services	07	02	11	003	07	02	11	003	00	-04	05	897	04	00	09	066	07	03	12	001

Note. Decimals omitted. PA = Positive Affectivity; WB = Well Being; SP = Social Potency; ACH = Achievement; SC = Social Closeness.

n = 2023 for all scales except for BISs new to the 1994 SII (i.e., ApArt, Comp, Cul, and Data), for which *n* = 490.

Table 3.1, cont.

	NA				ALI				AGG				SR				ABS			
	<i>r</i>	L	U	<i>p</i>																
Realistic	07	02	11	002	03	-02	07	240	15	11	20	<001	-04	-08	01	093	09	05	13	<001
Agriculture	02	-03	06	470	-04	-08	01	100	05	01	10	015	-07	-11	-03	002	11	06	15	<001
Nature	-04	-09	00	061	-11	-15	-06	<001	-11	-15	-06	<001	-02	-06	03	498	26	21	30	<001
Military Act.	12	07	16	<001	06	02	10	009	21	16	25	<001	-03	-07	02	270	05	01	10	020
Athletics	00	-04	05	965	-06	-10	-01	010	18	14	22	<001	-12	-16	-07	<001	-06	-11	-02	005
Mechanical Act.	08	03	12	001	06	02	10	007	15	10	19	<001	-07	-12	-03	001	04	00	08	068
Investigative	-02	-06	03	484	-05	-09	-01	023	-02	-06	03	475	-05	-09	-01	023	15	10	19	<001
Science	03	-02	07	240	00	-04	05	844	02	-03	06	459	-05	-10	-01	017	09	05	14	<001
Mathematics	-01	-06	03	570	00	-04	05	909	01	-03	05	630	-08	-13	-04	<001	-05	-09	00	038
Medical Science	00	-05	04	944	-05	-10	-01	019	02	-03	06	505	-04	-08	01	086	09	05	13	<001
Artistic	01	-03	06	567	-06	-10	-01	014	-13	-17	-08	<001	06	01	10	009	44	40	47	<001
Music/Dramatics	-01	-05	03	640	-06	-11	-02	005	-15	-19	-10	<001	07	03	12	001	40	37	44	<001
Art	01	-04	05	687	-05	-09	00	035	-12	-17	-08	<001	09	05	14	<001	39	35	43	<001
Applied Arts	05	-04	14	244	-02	-11	07	682	-05	-14	04	236	01	-08	10	859	35	27	43	<001
Writing	00	-05	04	858	-07	-11	-03	002	-15	-19	-11	<001	10	06	14	<001	35	31	39	<001
Culinary Arts	-05	-14	04	248	-13	-21	-04	005	-13	-21	-04	005	-01	-10	08	854	18	10	27	<001
Social	-10	-15	-06	<001	-10	-15	-06	<001	-22	-26	-18	<001	-04	-08	01	082	16	12	20	<001
Teaching	-11	-15	-06	<001	-10	-14	-06	<001	-22	-26	-18	<001	-01	-06	03	613	15	10	18	<001
Social Service	-08	-13	-04	<001	-09	-13	-04	<001	-23	-27	-18	<001	03	-01	08	132	20	16	24	<001
Medical Service	-01	-05	04	808	-01	-05	04	705	-06	-11	-02	005	-01	-05	04	786	09	04	13	<001
Religious Act.	-08	-13	-04	<001	-08	-12	-04	<001	-24	-28	-20	<001	-01	-06	03	553	12	07	16	<001
Enterprising	05	01	09	028	01	-03	06	517	10	06	15	<001	02	-03	06	460	10	05	14	<001
Public Speaking	01	-04	05	797	-02	-07	02	312	02	-02	06	380	-04	-09	00	055	16	12	20	<001
Law/Politics	02	-02	07	281	-02	-06	02	358	10	05	14	<001	-05	-09	00	043	09	04	13	<001
Merchandising	04	00	08	067	01	-03	06	576	04	00	09	046	03	-02	07	204	09	05	13	<001
Sales	07	02	11	003	05	01	09	028	13	08	17	<001	-01	-05	04	813	02	-02	06	375
Organiz Mgmt.	03	-01	08	158	01	-03	06	557	07	02	11	004	-03	-07	02	208	05	01	09	019
Conventional	03	-01	07	170	03	-01	08	156	03	-07	02	226	02	-02	06	360	00	-04	05	894
Data Mgmt.	06	-03	15	176	10	01	19	023	11	02	19	020	-08	-17	01	081	-01	-10	08	881
Computer Act.	08	-01	17	077	12	04	21	006	10	01	19	030	-04	-13	05	413	03	-06	12	536
Office Services	03	-01	08	165	03	-01	07	183	-08	-12	-04	<001	08	03	12	001	03	-01	07	188

Note. Decimals omitted. NA = Negative Affectivity; ALI = Alienation; AGG = Aggression; SR = Stress Reaction; ABS = Absorption.

Table 3.1, cont.

	CT				CTL				HA				TRA			
	<i>r</i>	L	U	<i>p</i>												
Realistic	-15	-20	-11	<001	-06	-11	-02	004	-31	-36	-27	<001	03	-02	07	214
Agriculture	-09	-14	-05	<001	-10	-15	-06	<001	-21	-25	-17	<001	12	08	17	<001
Nature	-03	-07	02	246	01	-04	05	776	-11	-15	-06	<001	07	03	11	002
Military Act.	-11	-15	-07	<001	-06	-10	-01	012	-24	-28	-20	<001	06	02	10	008
Athletics	-08	-12	-03	001	-10	-14	-05	<001	-15	-19	-11	<001	12	06	17	<001
Mechanical Act.	-13	-17	-08	<001	-05	-09	00	039	-28	-32	-24	<001	00	-05	04	915
Investigative	-05	-09	00	032	07	02	11	002	-19	-23	-15	<001	00	-05	04	961
Science	-05	-09	00	040	06	02	11	005	-20	-24	-16	<001	-02	-06	03	461
Mathematics	06	01	10	013	10	06	14	<001	-07	-11	-03	002	08	04	12	<001
Medical Science	-02	-06	03	425	05	01	09	025	-14	-18	-10	<001	03	-01	07	184
Artistic	-11	-15	-06	<001	-06	-11	-02	005	-06	-10	-01	011	-10	-14	-05	<001
Music/Dramatics	-07	-11	-03	002	-04	-09	00	055	-03	-07	02	215	-04	-09	00	049
Art	-09	-14	-05	<001	-06	-11	-02	005	-05	-09	00	032	-09	-13	-05	<001
Applied Arts	-14	-23	-06	002	-08	-17	01	075	-15	-24	-07	001	-09	-17	00	057
Writing	-06	-10	-01	021	-02	-06	03	479	-01	-05	04	764	-10	-14	-06	<001
Culinary Arts	14	05	23	002	06	-03	15	187	16	07	24	001	17	08	26	<001
Social	17	13	22	<001	08	04	12	<001	11	07	15	<001	22	18	26	<001
Teaching	10	06	15	<001	06	02	11	006	08	04	13	<001	09	05	14	<001
Social Service	11	07	15	<001	05	00	09	039	12	07	16	<001	10	05	14	<001
Medical Service	05	00	09	038	05	01	10	016	-07	-12	-03	001	11	06	15	<001
Religious Act.	24	20	29	<001	13	08	17	<001	09	05	14	<001	37	33	41	<001
Enterprising	-03	-07	02	218	-06	-10	-01	013	-05	-09	00	040	07	02	11	003
Public Speaking	-06	-10	-02	007	-05	-09	-01	027	-08	-12	-04	<001	02	-03	06	453
Law/Politics	-09	-13	-04	<001	-01	-06	03	523	-11	-15	-07	<001	-07	-11	-03	002
Merchandising	01	-03	06	540	-03	-07	02	246	02	-02	07	339	05	01	10	022
Sales	-05	-09	-01	029	-09	-13	-05	<001	-05	-09	00	032	05	01	09	030
Organiz Mgmt.	05	00	09	032	04	-01	08	105	00	-05	04	931	09	05	14	<001
Conventional	19	14	23	<001	17	13	22	<001	08	03	12	001	14	10	18	<001
Data Mgmt.	01	-08	10	790	03	-06	12	550	-07	-16	02	114	03	-06	12	515
Computer Act.	-07	-16	02	130	-05	-14	04	271	-12	-21	-04	006	-03	-12	06	540
Office Services	20	15	24	<001	14	10	18	<001	16	12	21	<001	12	08	16	<001

Note. Decimals omitted. CT = Constraint; CTRL = Control; HA = Harm Avoidance; TRA = Traditionalism.

Table 3.2

Pearson Product-Moment Correlations for Strong Scales with MPQ Scales—Total Sample (n=2023)

	PA	WB	SP	ACH	SC	NA	ALI	AGG	SR	CT	CTL	HA	TRA	ABS
R	10	07	03	12	-13	07	03	15	-04	-15	-06	-31	03	09
Ag	12	13	01	08	01	02	-04	05	-07	-09	-10	-21	12	11
Nat	15	16	-01	11	01	-04	-11	-11	-02	-03	01	-11	07	26
Mil	09	04	10	08	-09	12	06	21	-03	-11	-06	-24	06	05
Ath	24	20	20	09	21	00	-06	18	-12	-08	-10	-15	12	-06
Mech	06	03	-01	12	-16	08	06	15	-07	-13	-05	-28	00	04
I	20	12	08	27	-03	-02	-05	-02	-05	-05	07	-19	00	15
Sci	10	05	-02	21	-13	03	00	02	-05	-05	06	-20	-02	09
Math	12	07	02	22	-03	-01	00	01	-08	06	10	-07	08	-05
MedSci	19	12	11	18	07	00	-05	02	-04	-02	05	-14	03	09
A	17	11	11	06	03	01	-06	-13	06	-11	-06	-06	-10	44
MuDra	20	13	14	05	09	-01	-06	-15	07	-07	-04	-03	-04	40
Art	11	08	04	00	03	01	-05	-12	09	-09	-06	-05	-09	39
AppArt	14	08	02	05	-06	05	-02	-05	01	-14	-08	-15	-09	35
Wri	14	07	10	09	-01	00	-07	-15	10	-06	-02	-01	-10	35
Cul	21	24	08	07	19	-05	-13	-13	-01	14	06	16	17	18
S	37	26	17	17	29	-10	-10	-22	-04	17	08	11	22	16
Tea	21	19	09	15	18	-11	-10	-22	-01	10	06	08	09	15
SocSer	24	21	13	10	26	-08	-09	-23	03	11	05	12	10	20
MedSer	18	14	06	13	13	-01	-01	-06	-01	05	05	-07	11	09
Rel	16	15	02	10	12	-08	-08	-24	-01	24	13	09	37	12
E	28	17	36	09	20	05	01	10	02	-03	-06	-05	07	10
PubSpk	37	19	49	18	17	01	-02	02	-04	-06	-05	-08	02	16
LawPol	28	11	41	17	09	02	-02	10	-05	-09	-01	-11	-07	09
Merch	22	13	29	06	18	04	01	04	03	01	-03	02	05	09
Sale	19	09	29	00	17	07	05	13	-01	-05	-09	-05	05	02
OrgMgmt	29	16	35	14	16	03	01	07	-03	05	04	00	09	05
C	15	10	09	16	06	03	03	03	02	19	17	08	14	00
Data	12	10	08	11	-06	06	10	11	-08	01	03	-07	03	-01
Comp	06	05	02	05	-08	08	12	10	-04	-07	-05	-12	-03	03
OffSer	07	07	00	04	07	03	03	-08	08	20	14	16	12	03

Note. Decimals omitted. For BISs new to the 1994 SII (i.e., ApArt, Comp, Cul, and Data), $n = 490$ college students. Correlations .20 and greater are in bold. Correlations .30 and greater are also italicized.

Abbreviations: R = Realistic; I = Investigative; A = Artistic; S = Social; E = Enterprising; C = Conventional.

PA = Positive Affectivity; WB = Well Being; SP = Social Potency; ACH = Achievement; SC = Social

Closeness; NA = Negative Affectivity; ALI = Alienation; AGG = Aggression; SR = Stress Reaction;

ABS = Absorption; CT = Constraint; CTRL = Control; HA = Harm Avoidance; TRA = Traditionalism.

See Table 1.5 for a list of all BISs.

Table 3.2 (above) displays the point estimates for correlations of the 31x14 matrix, with estimates .20 and greater in bold, and estimates .30 and greater also italicized. (Because Table 3.2 fits

onto one page of text, the reader will subsequently be referred to Table 3.2 rather than the more comprehensive Table 3.1). Examination of Table 3.2 reveals that meaningful correlations generally group together more strongly by MPQ scale (vertical columns) than by SII scale (horizontal rows). Thus, correlations discussed below are organized according to the structure of the MPQ, starting with the broad domains converging most robustly with interest scales. As an additional aid, all correlations .30 and greater are listed in descending rank order in Table 3.3 below. Table 3.3 reveals that the strongest links between interest and personality scales occurred with four primary MPQ scales and one higher-order MPQ scale—namely, Social Potency (primary factor affiliated with Positive Affectivity), Absorption (primary factor affiliated with Positive Affectivity and Negative Affectivity), Positive Affectivity (higher-order factor), Traditionalism (primary factor affiliated with Constraint), and Harm Avoidance (primary factor affiliated with Constraint).

Table 3.3

Substantial SII//MPQ Correlations ($r_s \geq .30$), In Descending Order of r

SII Scale	MPQ Scale	r
Public Speaking (E)	Social Potency (PA)	.49
A	Absorption	.44
Law/Politics (E)	Social Potency (PA)	.41
Music/Dramatics (A)	Absorption	.40
Art (A)	Absorption	.39
Public Speaking (E)	PA	.37
Religious Activities (S)	Traditionalism (CT)	.37
E	Social Potency (PA)	.36
Organizational Management (E)	Social Potency (PA)	.35
Applied Art (A)	Absorption	.35
Writing (A)	Absorption	.35
S	PA	.31
R	Harm Avoidance (CT)	-.31

Note. $n = 2023$ except for Applied Art, for which $n = 490$ college students.

Higher-order scales are abbreviated. E = Enterprising; A = Artistic; S = Social; R = Realistic; PA = Positive Affectivity; CT = Constraint.

Positive Affectivity (PA) and Interests

The MPQ higher-order factor, Positive Affectivity (PA), is the personality scale that correlated most widely with interest scales. Positive Affectivity correlated meaningfully with a total of 12 interest scales. With r s ranging from .20 to .37, PA shared overlap with interest scales affiliated with five of the six GOTs (i.e., all but Conventional). Scales within the Enterprising theme were the group of interest scales most strongly connected with PA: The Enterprising GOT and all affiliated BISs (except Sales) correlated above .20 with PA. Specifically, the Enterprising GOT correlated .28 with PA, and the four BISs correlated with PA as follows: Public Speaking (.37), Organizational Management (.29), Law/Politics (.28), and Merchandising (.22). From the Realistic theme, the Athletics BIS correlated .24 with PA. In the Investigative theme, the GOT itself correlated .20 with PA. Among Artistic scales, two BISs—Music/Dramatics and Culinary Arts—correlated .20 and .21 with PA, respectively. Finally, within the Social theme, the Social GOT (.31), the Teaching BIS (.21), and the Social Service BIS (.24) all shared meaningful overlap with PA.

Primary scales affiliated with PA (i.e., Well Being, Social Potency, Achievement, Social Closeness) yielded an additional 17 meaningful correlations with SII scales, with r s ranging from .20 to .29. Most notable of these is the robust relation between Social Potency (SP) and the Enterprising theme—with the Enterprising GOT and all five Enterprising BISs correlating .29 and above with SP. Listed in descending order of magnitude, these scales correlated with SP as follows: Public Speaking BIS (.49), Law/Politics BIS (.41), Enterprising GOT (.36), Organizational Management BIS (.35), Merchandising BIS (.29), and Sales BIS (.29). In addition, SP correlated meaningfully with one Realistic BIS—Athletics (.20). These correlations illustrate that, although meaningful overlap was indicated with the higher-order scale, PA, the nature and magnitude of the connection between Enterprising interests and personality was more clear via examination of the primary (lower-order) personality scale, Social Potency.

Aside from the strong-hitting Social Potency scale, the remaining three PA-affiliated primary factors each had three or four meaningful correlations with interest scales. Achievement is discussed first, followed by Well-Being and Social Closeness. Achievement (ACH) is unique among the PA-affiliated primary factors in that it correlated meaningfully with Investigative scales. Specifically, ACH correlated .27 with the Investigative GOT, .21 with the Science BIS, and .22 with the Mathematics BIS. These correlations are also noteworthy for revealing a relation trend not identified by the higher-order factor, PA.

The Investigative GOT and the affiliated BISs of Science and Mathematics correlated more substantially with the PA-affiliated primary factor, ACH, than with PA itself (r s with PA = .20 with

Investigative GOT, .10 with Science BIS, and .12 with Mathematics BIS). The Medical Science BIS was an exception among the Investigative scales, as it correlated similarly but less substantially with both PA (.19) and ACH (.18). The correlation between these Investigative scales and ACH is also unique in that ACH did not correlate meaningfully ($\geq .20$) with any other interest scales.

Meaningful correlations for the PA-affiliated primary factors of Well Being (WB) and Social Closeness (SC) with SII scales were more widely dispersed across the RIASEC code than those with the ACH scale. Well Being correlated $\geq .20$ with one Realistic BIS—Athletics (.20); one Artistic BIS—Culinary Arts (.24); the Social GOT (.26); and one Social BIS—Social Service (.21). Social Closeness correlated meaningfully with one Realistic BIS—Athletics (.21); the Social GOT (.29); one Social BIS—Social Service (.26); and the Enterprising GOT (.20). It is noteworthy that the Athletics BIS (R theme) correlated $\geq .20$ with all but one PA-affiliated personality scale (i.e., ACH). Specifically, Athletics correlated .24 with PA, .20 with WB, .20 with SP, and .21 with SC.

The connection between the Athletics BIS (Realistic theme) and several PA scales (specific correlations listed above) is unique in the correlation matrix, as none of the other BISs have correlations $\geq .20$ with more than two MPQ primary factors within one of the broad personality domains. In addition, none of the other Realistic BISs correlated positively above .15 with any PA-affiliated scales. In this sense, the Athletics BIS is more similar to the Social BISs than to the other Realistic BISs in the way it correlates with personality. This observation is not surprising given that the Athletics BIS was categorized in the Social domain in the 1985 version of the SII.

The exception to the affiliation of the Athletics BIS with Social scales in the way it correlates with personality is the following: Whereas the Athletics BIS also correlated positively with the MPQ primary factor, Aggression (.18), Aggression (AGG) was negatively correlated with the Social GOT and the Social BISs (specifically, -.22 with the Social GOT; -.22 with the Teaching BIS; -.23 with the Social Service BIS; -.06 with the Medical Service BIS; and, -.24 with the Religious Activities BIS). Furthermore, AGG is grouped within the MPQ with the Negative Affectivity (NA) higher-order factor. In the correlation matrix, interest scales that share a meaningful positive correlation with PA typically share a weak or negative correlation with NA and NA-affiliated primary scales. The Athletics BIS is unique in that it correlated meaningfully with PA, yet also shared a modest positive correlation with NA-affiliated AGG (whereas $r = .00$ between Athletics and NA).

Absorption (ABS) and Interests

Absorption (ABS) is an MPQ primary factor associated with both Negative Affectivity (NA) and Positive Affectivity (PA). Because ABS, unlike the other primary factors, does not clearly fit with one higher-order factor over the other two, it is considered separately in this report. Individuals

high in ABS are described as responsive to evocative sights and sounds, and readily captured by entrancing stimuli (Tellegen, 1982). Absorption yielded seven meaningful correlations with interest scales, and it boasted three of the five largest correlations within the entire correlation matrix.

Five of these correlations represent the substantial overlap between ABS and Artistic scales. Absorption correlated above .30 with all but one (Culinary Arts) of the SII scales within the Artistic theme. Specifically, ABS correlated .44 with the Artistic GOT, .40 with the Music/Dramatics BIS, .39 with the Art BIS, .35 with the Applied Arts BIS, .35 with the Writing BIS. In addition, ABS shared a .26 correlation with the Nature BIS (R theme) and a .20 correlation with the Social Service BIS (S theme). In terms of how Absorption correlates with interest scales, the general trends that are obvious from a glance at Table 3.2 reveal that ABS clearly appears to have more in common with PA personality scales (i.e., mostly positive correlations) than with NA personality scales (i.e., many negligible or negative correlations).

Constraint (CT) and Interests

Constraint (CT) and CT-affiliated MPQ primary factors pertain to individuals' styles of behavior regulation. Individuals high in CT are described as cautious, planful, and conservative (Tellegen, 1982). Affiliated with CT are the primary factors of Control (CTL), Harm Avoidance (HA), and Traditionalism (TRA).

Nine correlations were .20 or greater between interest scales and CT or CT-affiliated scales. Five of these nine correlations were with HA, which had a substantial negative relation with the Realistic GOT, as well as meaningful overlap with several of the Realistic BISs. Individuals scoring high on the Realistic GOT are characterized by an affinity for building, repairing, and outdoor activities (Harmon et al., 1994). These individuals tend to like occupations such as auto mechanic, groundskeeper, plumber, police officer, electrician, engineer, and building contractor. Harm Avoidance correlated -.31 with the Realistic GOT, -.28 with the Mechanical Activities BIS, -.24 with the Military Activities BIS, and -.21 with the Agriculture BIS. These correlations are noteworthy given that the previous FFM meta-analyses (i.e., Larson et al., 2002; Barrick et al., 2003) reported no meaningful overlap between Realistic interests and personality.

In addition to its overlap with Realistic interests, HA correlated -.20 with the Science BIS (I theme). The Science BIS is the first BIS to follow the Realistic BISs in the order of SII scales (See Table 3.2)—suggesting that this interest-personality link reveals an underlying structure shared by both the MPQ and the RIASEC models.

Only two of the nine correlations .20 or greater between interests and CT-affiliated scales were with CT itself. The higher-order CT scale correlated .24 with the Religious Activities BIS

(S theme) and .20 with the Office Services BIS (C theme). (The relation between Religious Activities and CT is discussed in the following paragraph, in conjunction with discussion of the Traditionalism scale.) The .20 correlation between CT and Office Services is noteworthy in that this correlation appears to account for most of the relation found between CT and the broader Conventional GOT (.19). Thus, individuals with interests in the two Conventional BISs new to the 1994 SII—Data Management ($r = .01$) and Computer Activities ($r = -.07$)—may not share as much in common with the individuals having high interests in the older Office Services BIS and general Conventional activities.

Furthermore, examination of the more specific scales reveals that the Conventional GOT and the affiliated BISs did not correlate meaningfully with any of the CT-affiliated primary scales (i.e., Control, Harm Avoidance, Traditionalism). Thus, results of this study do not support a general meaningful connection between Conventional interests and a constrained or conscientious personality style as suggested by Blake and Sackett (1999) and FFM-SII meta-analyses by Larson et al. (2002) and Barrick et al. (2003).

Both Constraint (CT) and the affiliated primary factor, Traditionalism (TRA), shared meaningful overlap with Religious Activities. Traditionalism refers to the desire for a conservative social environment and the endorsement of high moral standards (Tellegen, 1982). Not surprisingly, TRA correlated substantially (.37) with the Religious Activities BIS (S theme). In addition, it shared modest overlap with the Social GOT (.22). Aside from its link with those reporting high interests in Religious Activities, the TRA personality construct does not appear to share a strong connection with any of the other interest domains.

Negative Affectivity (NA) and Interests

The final higher-order MPQ domain, Negative Affectivity (NA), is affiliated with the primary factors of Alienation (ALI), Aggression (AGG), and Stress Reaction (SR). Individuals scoring high on NA are described as easily stressed, often involved in adversarial relationships, and prone to respond to everyday hassles with anxiety and anger (Tellegen, 1982). Within the NA domain, only five correlations with interest scales were .20 or greater, and none reached .30. Furthermore, correlations with AGG accounted for all five of the meaningful correlations. Thus, there were no meaningful correlations between interest scales and NA, ALI, or SR.

Aggression correlated negatively with four scales within the Social theme: the Religious Activities BIS (-.24); the Social Service BIS (-.23); the Social GOT (-.22); and the Teaching BIS (-.22). In addition, AGG correlated positively with the Military Activities BIS (.21; R theme). The lack of substantial correlations between interests and NA-affiliated scales in the present study is

consistent with previous FFM meta-analyses (i.e., Larson et al., 2002; Barrick et al, 2003), which similarly reported no substantial overlap between Neuroticism (or Emotional Stability) and interests.

Summary of Substantial I-P Correlations

Among the MPQ higher-order dimensions, PA was clearly most strongly connected with interests in general. Positive Affectivity correlated .20-.29 with 10 interest scales, and $\geq .30$ with two interest scales (i.e., Social GOT, Public Speaking BIS). Adding in correlations with PA-affiliated primary scales, a total of 24 correlations between the PA domain and SII scales were .20-.29, and six correlations were .30 or greater. Overall, PA-affiliated scales were connected most strongly with Enterprising interests, followed by Social interests.

At a more specific level, the primary factors of Social Potency (SP) and Absorption (ABS) shared the most substantial overlap with interests. Namely, SP correlated $\geq .30$ with four Enterprising scales (i.e., Enterprising GOT, Public Speaking BIS, Law/Politics BIS, and Organizational Management BIS), and ABS correlated $\geq .30$ with four Artistic scales (i.e., Artistic GOT, Music/Dramatics BIS, Art BIS, Applied Arts BIS, and Writing BIS). In addition, Traditionalism (affiliated with the CT higher-order factor) correlated .37 with Religious Activities (a Social BIS); and, Harm Avoidance (also affiliated with CT) correlated -.31 with the Realistic GOT. Thus, the higher-order dimension of CT followed PA in overall convergence with interests, whereas NA and affiliated scales yielded no correlations $\geq .30$ with interests.

Among the SII scales, the Enterprising and Artistic domains were the leading interest domains for yielding substantial correlations with personality scales, with each domain yielding five correlations .30 or greater. The correlations with Artistic interest scales were primarily confined to connections with one MPQ scale, Absorption, whereas Enterprising and Social interests were connected with a slightly wider range of personality scales. Specifically, Enterprising interest scales were robustly convergent with PA and Social Potency (SP), whereas Social scales shared more scattered correlations with PA, Well-Being (WB), Social Closeness (SC), and Traditionalism (TRA; See Table 3.2). Within the Realistic domain, meaningful convergence was concentrated among the negative correlations between several interest scales with Harm Avoidance (HA). Finally, Conventional interests shared no substantial correlations with a personality factor, with only one correlation reaching a modest .20 (i.e., Office Services with CT).

The number of interest-personality correlations .30 and greater contained within broad SII and MPQ domains are summarized in Table 3.4 below. As illustrated in the table, PA (MPQ), Absorption (MPQ), Artistic (SII), and Enterprising (SII) were the broad domains that accounted for the majority (11 out of 13) of the substantial correlations ($r_s \geq .30$) between interest and personality

scales. The NA (MPQ), Investigative (SII), and Conventional (SII) domains are notable for yielding no substantial correlations between interest and personality scales.

Table 3.4

*Count of Substantial Interest-Personality Correlations ($r_s \geq .30$)
Between Scales within Major SII and MPQ Domains*

	PA	NA	CT	ABS	TOT
R	0	0	1	0	1
I	0	0	0	0	0
A	0	0	0	5	5
S	1	0	1	0	2
E	5	0	0	0	5
C	0	0	0	0	0
TOT	6	0	2	5	13

Note. $n = 2023$. Counts refer to correlations between GOTs and BISs of the SII with primary and higher-order factors of the MPQ.

Scale abbreviations: R=Realistic; I=Investigative; A=Artistic; S=Social; E=Enterprising; C=Conventional. PA=Positive Affectivity; NA=Negative Affectivity; CT=Constraint; ABS=Absorption.

Meta-Analyses by Sex

Table 3.5 (following page) displays the meta-analytic results for the correlations between the 31 SII scales and the 14 MPQ scales for the female and male samples separately. Separate correlations for females and males were not attainable for the Schmidt (1998) sample; thus, the sex-specific meta-analyses were based on four of the five studies, for total sample sizes of 709 females and 521 males (1230 combined). Due to the larger sample size ($n = 2023$) for the combined sex analyses, some correlation effect sizes are larger for the total sample analyses discussed previously (Table 3.1) than for either females or males alone in the sex-specific analyses (Table 3.5).

Table 3.5

Effect Sizes with Lower and Upper Limits for Correlations between MPQ and SII Scales for Female and Male Samples, with ANOVA Test Results for Sex Differences

	Positive Affectivity									Well-Being							
	Females			Males			ANOVA			Females			Males			ANOVA	
	L	<i>r</i>	U	L	<i>r</i>	U	Var	<i>p</i>	L	<i>r</i>	U	L	<i>r</i>	U	Var	<i>p</i>	
R	05	12	19	10	19	27	1.33	.25	-03	04	12	06	15	23	3.43	.06	
Ag	04	11	18	06	14	23	.33	.57	05	12	19	03	11	20	.02	.90	
Nat	04	11	18	01	10	18	.05	.83	-04	04	11	04	13	21	2.39	.12	
Mil	00	07	15	08	17	25	2.75	.10	-06	01	09	04	12	21	3.51	.06	
Ath	14	21	28	16	24	32	.33	.56	12	19	26	13	21	29	.17	.68	
Mech	02	10	17	06	15	23	.81	.37	-04	04	11	02	11	20	1.57	.21	
I	11	19	26	11	19	27	.01	.92	-02	05	13	02	11	19	.80	.37	
Sci	04	11	18	03	11	20	.00	.96	-07	01	08	-04	05	13	.47	.49	
Math	08	15	22	01	10	18	.84	.36	05	12	19	-04	05	14	1.43	.23	
MedSci	03	11	18	11	19	27	2.34	.13	-06	01	09	03	12	21	3.35	.07	
A	12	19	26	02	11	19	2.12	.15	-01	07	14	-05	03	12	.33	.57	
MuDra	15	23	30	04	12	21	3.22	.07	03	11	18	-02	07	15	.53	.47	
Art	04	12	19	-03	06	15	.95	.33	-05	03	10	-07	02	11	.02	.88	
ApArt	03	14	25	-02	13	28	.01	.91	-07	04	15	-02	13	28	.87	.35	
Wri	09	17	24	-06	03	11	5.66	.07	-04	03	11	-10	-01	08	.48	.49	
Cul	11	22	32	13	28	41	.46	.50	10	20	31	11	26	40	.34	.56	
S	25	31	38	23	31	38	.02	.88	18	25	32	15	23	31	.14	.71	
Tea	13	20	27	09	18	26	.18	.67	09	16	23	06	15	23	.06	.81	
SocSer	18	25	32	14	23	31	.22	.64	10	17	25	11	19	28	.12	.74	
MedSer	02	09	16	08	16	25	1.60	.21	-01	07	14	00	09	18	.15	.70	
Rel	12	19	26	06	15	23	.57	.45	10	17	25	00	09	17	2.23	.14	
E	21	28	34	24	32	39	.61	.43	09	16	23	14	23	31	1.42	.23	
PubSpk	35	41	47	28	36	43	1.18	.28	14	21	28	12	21	29	.00	.95	
LawPol	24	31	38	17	26	34	1.12	.29	05	12	19	04	13	21	.02	.90	
Merch	16	23	30	14	22	31	.00	.95	06	13	21	07	16	24	.21	.65	
Sale	09	17	24	18	26	34	2.97	.08	03	10	17	11	19	28	2.72	.10	
OrgMgmt	24	31	37	23	31	38	.00	1.00	12	19	26	13	21	29	.13	.72	
C	03	11	18	03	12	20	.03	.87	03	10	17	-01	08	16	.17	.68	
Data	03	14	25	-10	06	21	.81	.37	05	16	26	-08	07	22	.81	.37	
Comp	-09	03	13	-07	08	23	.34	.56	-03	08	18	-09	06	21	.02	.89	
OffSer	-08	-01	07	-06	03	11	.35	.55	-01	06	14	-09	00	08	1.20	.27	

Note. Decimals omitted for correlations (U, *r*, L). *n* = 709 females; *n* = 521 males except for BISs new to the

1994 SII (ApArt, Comp, Cul, Data), for which *n* = 322 F and 164 M college students. Abbreviations:

R=Realistic; I=Investigative; A=Artistic; S=Social; E=Enterprising; C=Conventional. See Table 1.5 for a complete list of SII BISs. Significance testing: *p*-values <.01 are in bold.

(table continues)

Table 3.5, cont.

	Social Potency									Achievement							
	Females			Males			ANOVA			Females			Males			ANOVA	
	L	r	U	L	r	U	Var	p	L	r	U	L	r	U	Var	p	
R	-12	-.05	03	00	08	17	5.00	.03	08	16	23	09	18	26	.18	.67	
Ag	-09	-.02	06	-05	04	13	.97	.33	-01	06	14	02	11	19	.61	.43	
Nat	-14	-.06	01	-10	-.02	07	.65	.42	03	10	18	-05	04	13	1.14	.29	
Mil	-02	05	13	06	14	23	2.32	.13	05	13	20	-04	05	14	1.76	.18	
Ath	09	16	23	16	25	33	2.27	.13	07	14	21	03	12	20	.21	.64	
Mech	-15	-.08	00	-05	04	13	4.13	.04	09	16	23	12	20	28	.46	.50	
I	-06	01	09	04	13	21	3.92	.05	19	26	33	11	19	28	1.37	.24	
Sci	-14	-.07	01	-08	01	10	1.75	.19	14	21	28	12	20	28	.06	.80	
Math	-09	-.02	06	-04	05	13	1.05	.30	14	21	28	10	19	27	.18	.67	
MedSci	-05	03	10	10	19	27	7.58	<.01	07	15	22	06	15	23	.00	.96	
A	-01	06	14	04	13	21	1.20	.27	01	09	16	-15	-.07	02	7.15	<.01	
MuDra	03	11	18	06	14	23	.39	.53	00	07	15	-19	-10	-.02	9.19	<.01	
Art	-09	-.02	06	-02	06	15	1.98	.16	-05	03	10	-16	-.08	01	3.28	.07	
ApArt	-16	-.05	06	02	17	32	5.18	.02	01	12	23	-26	-11	04	5.92	.02	
Wri	02	09	16	-02	07	15	.18	.67	06	13	20	-16	-.08	01	12.65	<.001	
Cul	-05	06	16	12	27	41	5.04	.02	04	14	25	-15	01	16	1.98	.16	
S	08	15	22	19	27	35	4.90	.03	12	19	26	02	10	19	2.64	.10	
Tea	01	09	16	02	11	20	.16	.69	08	15	22	-01	08	16	1.70	.19	
SocSer	06	13	20	14	23	31	2.96	.09	07	15	22	-07	01	10	5.22	.02	
MedSer	-13	-.05	02	07	16	24	12.62	<.001	04	11	18	00	08	17	.20	.66	
Rel	-09	-.02	06	-03	05	14	1.51	.22	06	14	21	-03	06	15	1.74	.19	
E	27	34	40	34	42	49	2.70	.10	04	11	18	-01	08	16	.32	.57	
PubSpk	46	51	57	43	49	56	.21	.65	17	24	31	02	11	19	5.38	.02	
LawPol	34	40	46	33	40	47	.00	.99	17	24	31	01	09	18	6.79	<.01	
Merch	20	27	34	26	34	41	1.45	.23	03	10	17	-06	03	11	1.61	.20	
Sale	20	27	33	29	36	44	3.52	.06	-06	01	09	-07	02	11	.01	.91	
OrgMgmt	29	36	42	31	39	46	.37	.54	11	18	25	02	11	19	.28	.60	
C	-08	-.01	07	01	09	18	2.89	.09	05	12	20	06	14	23	.13	.72	
Data	-06	05	16	-12	04	19	.02	.88	-03	08	19	-05	10	25	.03	.86	
Comp	-16	-.06	06	-09	07	22	1.50	.22	-11	00	11	-08	08	23	.62	.43	
OffSer	-17	-10	-.02	-09	00	08	2.58	.11	-08	00	07	-04	05	13	.80	.37	

Note. Decimals omitted for correlations (U, r, L). $n = 709$ females; $n = 521$ males except for BISs new to the

1994 SII (ApArt, Comp, Cul, Data), for which $n = 322$ F and 164 M college students. Abbreviations:

R=Realistic; I=Investigative; A=Artistic; S=Social; E=Enterprising; C=Conventional. See Table 1.5 for a complete list of SII BISs. Significance testing: p -values $<.01$ are in bold.

(table continues)

Table 3.5, cont.

	Social Closeness									Negative Affectivity								
	Females			Males			ANOVA			Females			Males			ANOVA		
	L	r	U	L	r	U	Var	p	L	r	U	L	r	U	Var	p		
R	-.25	-.18	-.11	-.15	-.07	.02	4.06	.04	-.03	.05	.12	-.04	.04	.13	.01	.93		
Ag	-.10	-.03	.05	-.11	-.02	.07	.02	.89	-.10	-.03	.05	-.01	.08	.16	3.03	.08		
Nat	-.16	-.09	-.01	-.18	-.10	-.01	.06	.81	-.02	.05	.13	-.07	.02	.10	.41	.52		
Mil	-.20	-.12	-.05	-.10	-.01	.07	3.50	.06	.02	.09	.16	-.02	.07	.15	.14	.71		
Ath	.10	.17	.25	.12	.20	.29	.28	.60	-.14	-.07	.00	-.09	-.01	.08	1.26	.26		
Mech	-.26	-.19	.12	-.16	-.08	.01	3.76	.05	-.01	.07	.14	-.03	.05	.14	.07	.80		
I	-.11	-.04	.03	-.17	-.08	.00	.54	.46	-.07	.01	.08	-.06	.03	.11	.11	.74		
Sci	-.19	-.12	-.04	-.24	-.16	-.07	.52	.47	-.02	.05	.13	-.04	.05	.13	.01	.91		
Math	-.01	.06	.14	-.14	-.05	.03	4.04	.04	-.13	-.06	.02	-.08	.00	.09	1.09	.30		
MedSci	-.05	.03	.10	-.12	-.03	.05	1.02	.31	-.07	.01	.08	-.02	.07	.15	1.12	.29		
A	-.17	-.10	-.03	-.12	-.04	.05	1.14	.28	.00	.07	.15	.03	.12	.21	.66	.42		
MuDra	-.07	.00	.08	-.08	.00	.09	.00	.99	-.03	.04	.11	-.02	.07	.16	.28	.59		
Art	-.15	-.08	-.01	-.14	-.06	.03	.13	.72	.03	.10	.17	.01	.10	.18	.00	.97		
ApArt	-.18	-.07	.04	-.23	-.08	.08	.00	.95	-.11	.00	.11	.00	.16	.31	2.72	.10		
Wri	-.18	-.11	-.03	-.16	-.07	.02	.44	.51	-.04	.04	.11	-.02	.07	.16	.31	.58		
Cul	.03	.14	.24	-.08	.07	.22	.48	.49	-.22	-.11	.00	.00	.15	.30	7.63	<.01		
S	.21	.28	.34	.15	.23	.31	.72	.40	-.18	-.10	-.03	-.09	.00	.08	2.94	.86		
Tea	.10	.17	.24	.05	.13	.22	.55	.46	-.18	-.10	-.03	-.11	-.02	.07	2.02	.16		
SocSer	.16	.23	.30	.10	.19	.27	.50	.48	-.13	-.05	.02	-.09	.00	.08	.69	.41		
MedSer	.00	.08	.15	-.07	.01	.10	1.10	.30	-.06	.01	.09	.01	.10	.18	2.12	.15		
Rel	.01	.08	.16	.04	.12	.21	.47	.49	-.14	-.07	.01	-.12	-.03	.06	.38	.54		
E	.16	.23	.30	.08	.16	.25	1.55	.21	-.07	.00	.07	.01	.10	.19	3.04	.08		
PubSpk	.12	.19	.26	.07	.16	.24	.28	.60	-.14	-.07	.00	-.01	.08	.16	6.36	.01		
LawPol	.05	.12	.20	.00	.08	.17	.48	.49	-.14	-.06	.01	-.01	.08	.16	5.74	.02		
Merch	.14	.21	.28	.02	.10	.19	3.69	.05	-.06	.02	.09	.01	.10	.19	1.93	.17		
Sale	.14	.21	.28	.07	.16	.24	.90	.34	-.05	.02	.09	-.02	.07	.15	.70	.40		
OrgMgmt	.14	.21	.28	.07	.16	.24	.78	.38	-.11	-.03	.04	-.02	.06	.15	2.72	.10		
C	.00	.07	.15	-.07	.01	.10	1.02	.31	-.06	.02	.09	-.03	.06	.15	.58	.44		
Data	-.03	.08	.19	-.23	-.08	.07	2.83	.09	-.15	-.04	.07	-.05	.11	.26	2.30	.13		
Comp	-.14	-.03	.08	-.15	.00	.16	.11	.75	-.12	-.01	.10	-.01	.14	.29	2.56	.11		
OffSer	-.03	.04	.12	-.11	-.02	.07	1.27	.26	-.05	.02	.09	.00	.09	.17	1.25	.26		

Note. Decimals omitted for correlations (U, r, L). $n = 709$ females; $n = 521$ males except for BISs new to the

1994 SII (ApArt, Comp, Cul, Data), for which $n = 322$ F and 164 M college students. Abbreviations:

R=Realistic; I=Investigative; A=Artistic; S=Social; E=Enterprising; C=Conventional. See Table 1.5 for a complete list of SII BISs. Significance testing: p -values $<.01$ are in bold.

(table continues)

Table 3.5, cont.

	Alienation							Aggression								
	Females			Males			ANOVA		Females			Males			ANOVA	
	L	r	U	L	r	U	Var	p	L	r	U	L	r	U	Var	p
R	-.08	.00	.07	-.08	.01	.09	.02	.88	-.04	.04	.11	-.01	.08	.16	.41	.52
Ag	-.11	-.04	.04	-.07	.01	.10	.70	.40	-.08	-.01	.07	.00	.09	.17	2.60	.11
Nat	-.12	-.05	.03	-.14	-.06	.03	.02	.89	-.11	-.03	.04	-.13	-.04	.05	.03	.87
Mil	-.06	.02	.09	-.06	.03	.11	.02	.89	.04	.12	.19	.07	.16	.24	.50	.48
Ath	-.17	-.09	-.02	-.09	.00	.09	2.67	.10	-.03	.05	.12	.10	.19	.27	5.72	.02
Mech	-.04	.04	.11	-.06	.02	.11	.08	.78	-.06	.01	.09	-.02	.06	.15	.73	.39
I	-.10	-.03	.05	-.10	-.02	.07	.05	.82	-.16	-.08	-.01	-.09	.00	.09	2.02	.16
Sci	-.07	.01	.08	-.07	.02	.10	.02	.88	-.14	-.07	.00	-.10	-.01	.07	.98	.32
Math	-.13	-.06	.02	-.09	.00	.09	.90	.34	-.16	-.09	-.01	-.07	.02	.10	3.24	.07
MedSci	-.11	-.04	.04	-.06	.03	.11	1.14	.29	-.09	-.02	.06	.01	.09	.18	3.55	.06
A	-.13	-.06	.02	-.05	.04	.13	2.71	.10	-.11	-.03	.04	-.10	-.01	.08	.15	.70
MuDra	-.14	-.07	.01	-.07	.02	.10	2.08	.15	-.12	-.04	.03	-.10	-.02	.07	.22	.64
Art	-.09	-.01	.06	-.06	.03	.12	.50	.48	-.09	-.02	.06	-.09	-.01	.08	.03	.87
ApArt	-.19	-.08	.03	-.06	.09	.25	3.08	.08	-.22	-.11	.00	-.11	.04	.20	2.58	.11
Wri	-.12	-.05	.03	-.14	-.05	.03	.01	.93	-.14	-.07	.00	-.14	-.05	.03	.09	.77
Cul	-.31	-.21	-.10	-.01	.14	.29	13.08	<.001	-.21	-.10	.01	-.01	.14	.29	6.26	.01
S	-.16	-.08	-.01	-.08	.01	.09	2.30	.13	-.27	-.20	-.12	-.16	-.07	.02	4.82	.03
Tea	-.16	-.09	-.02	-.12	-.04	.05	.78	.38	-.26	-.19	-.11	-.19	-.10	-.02	2.20	.14
SocSer	-.11	-.04	.04	-.08	.01	.10	.60	.44	-.22	-.15	-.07	-.17	-.08	.01	1.32	.25
MedSer	-.05	.02	.10	.02	.10	.19	1.82	.18	-.14	-.06	.01	-.01	.08	.16	5.73	.02
Rel	-.15	-.08	.00	-.13	-.04	.05	.39	.53	-.31	-.24	-.17	-.29	-.21	-.12	.37	.54
E	-.09	-.02	.06	.02	.11	.19	4.44	.04	.01	.08	.16	.11	.20	.28	4.02	.04
PubSpk	-.15	-.08	.00	-.04	.05	.13	4.52	.03	-.07	.01	.08	-.02	.07	.16	1.19	.27
LawPol	-.17	-.10	-.02	-.03	.06	.14	7.19	<.01	-.02	.06	.13	.01	.10	.18	.43	.51
Merch	-.08	.00	.07	.02	.11	.19	3.72	.05	.00	.07	.14	.09	.17	.26	3.10	.08
Sale	-.03	.04	.12	-.01	.07	.16	.24	.62	.02	.09	.17	.10	.19	.27	2.69	.10
OrgMgmt	-.11	-.04	.04	.00	.09	.17	4.66	.03	-.03	.04	.12	.04	.12	.21	1.91	.17
C	-.07	.00	.07	.02	.11	.20	3.57	.06	-.10	-.02	.05	-.09	.00	.09	.13	.72
Data	-.15	-.04	.07	.01	.17	.31	4.36	.04	-.11	-.01	.11	-.12	.03	.19	.16	.69
Comp	-.10	.01	.12	.03	.18	.33	3.18	.07	-.09	.02	.13	-.17	-.01	.14	.10	.76
OffSer	-.06	.01	.08	.04	.13	.21	3.99	.05	-.10	-.02	.05	-.10	-.02	.07	.01	.92

Note. Decimals omitted for correlations (U, r, L). $n = 709$ females; $n = 521$ males except for BISs new to the

1994 SII (ApArt, Comp, Cul, Data), for which $n = 322$ F and 164 M college students. Abbreviations:

R=Realistic; I=Investigative; A=Artistic; S=Social; E=Enterprising; C=Conventional. See Table 1.5 for a complete list of SII BISs. Significance testing: p -values $<.01$ are in bold.

(table continues)

Table 3.5, cont.

	Stress Reaction									Constraint								
	Females			Males			ANOVA			Females			Males			ANOVA		
	L	r	U	L	r	U	Var	p	L	r	U	L	r	U	Var	p		
R	-15	-.08	00	-16	-.07	02	.02	.90	-21	-.14	-06	-14	-.05	04	2.28	.13		
Ag	-19	-.11	-04	-10	-.01	07	3.02	.08	-21	-.14	-06	-12	-.04	05	2.91	.09		
Nat	-.08	-.01	07	-16	-.08	01	1.39	.24	-17	-.10	-02	-17	-.08	00	.07	.79		
Mil	-.06	01	09	-13	-.04	05	.83	.36	-12	-.05	03	-13	-.05	04	.00	.98		
Ath	-18	-.11	-03	-18	-.10	-01	.02	.89	-16	-.08	-01	-11	-.02	06	1.04	.31		
Mech	-13	-.05	02	-13	-.04	05	.06	.81	-15	-.08	00	-.09	00	09	1.83	.18		
I	-12	-.05	02	-15	-.07	02	.06	.81	-10	-.02	05	-14	-.06	03	.32	.57		
Sci	-.09	-.01	06	-12	-.03	05	.16	.69	-.08	-.01	06	-12	-.03	06	.10	.75		
Math	-17	-.09	-02	-14	-.06	03	.44	.51	01	08	16	00	09	17	.01	.94		
MedSci	-.09	-.02	06	-14	-.06	03	.47	.49	-.09	-.02	06	-16	-.07	02	.82	.36		
A	-.06	02	09	03	12	20	2.95	.09	-23	-.16	-08	-32	-.24	-16	2.50	.11		
MuDra	-.09	-.02	06	-.03	05	14	1.46	.23	-19	-.12	-04	-33	-.25	-16	5.32	.02		
Art	-.03	05	12	00	09	17	.39	.53	-20	-.13	-06	-30	-.22	-14	2.55	.11		
ApArt	-14	-.03	08	-.07	09	24	1.62	.20	-24	-.14	-03	-35	-.21	-05	.55	.46		
Wri	-.08	-.01	07	04	13	21	5.47	.02	-19	-.12	-04	-25	-.16	-08	.67	.41		
Cul	-19	-.08	03	-18	-.03	13	.24	.62	-.04	07	18	-17	-.01	14	.64	.42		
S	-17	-.10	-02	-.09	00	09	2.91	.09	05	13	20	-.03	06	15	1.24	.27		
Tea	-15	-.08	00	-11	-.02	06	.85	.36	-.03	05	12	-.08	01	09	.46	.50		
SocSer	-13	-.05	02	-11	-.02	06	.25	.62	00	07	15	-10	-.01	08	1.87	.17		
MedSer	-.09	-.01	06	-10	-.02	07	.01	.92	01	09	16	-15	-.07	02	6.94	<.01		
Rel	-14	-.07	00	-12	-.03	06	.54	.46	17	24	31	15	23	31	.03	.87		
E	-13	-.06	02	-15	-.06	03	.00	.98	-13	-.05	02	-11	-.02	06	.25	.61		
PubSpk	-23	-.16	-08	-10	-.01	08	6.55	.01	-19	-.11	-04	-13	-.05	04	1.31	.25		
LawPol	-19	-.11	-04	-.09	00	09	3.74	.05	-19	-.12	-04	-13	-.04	05	1.74	.19		
Merch	-.09	-.01	06	-12	-.03	05	.14	.71	-.08	-.01	07	-10	-.02	07	.02	.88		
Sale	-11	-.03	04	-14	-.06	03	.18	.67	-10	-.03	04	-15	-.06	03	.27	.60		
OrgMgmt	-15	-.08	-01	-15	-.06	02	.08	.78	-.05	03	10	-.04	05	13	.12	.73		
C	-.07	00	07	-10	-.02	07	.08	.78	09	16	23	14	22	30	1.23	.27		
Data	-17	-.07	04	-16	00	15	.45	.50	-.06	05	16	05	20	34	2.40	.12		
Comp	-15	-.04	07	-.08	08	23	1.61	.20	-15	-.04	07	-.05	10	25	2.22	.14		
OffSer	-.04	04	11	-.04	04	13	.01	.91	09	17	24	08	16	24	.01	.92		

Note. Decimals omitted for correlations (U, r, L). $n = 709$ females; $n = 521$ males except for BISs new to the

1994 SII (ApArt, Comp, Cul, Data), for which $n = 322$ F and 164 M college students. Abbreviations:

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(table continues)

Table 3.5, cont.

	Control									Harm Avoidance								
	Females			Males			ANOVA			Females			Males			ANOVA		
	L	r	U	L	r	U	Var	p	L	r	U	L	r	U	Var	p		
R	-10	-.03	.04	-.09	.00	.09	.26	.61	-.36	-.29	-.22	-.36	-.28	-.20	.03	.86		
Ag	-.19	-.11	-.04	-.15	-.06	.03	.79	.37	-.29	-.22	-.15	-.30	-.22	-.14	.00	.98		
Nat	-.11	-.03	.04	-.10	-.02	.07	.11	.74	-.29	-.22	-.15	-.28	-.20	-.11	.25	.61		
Mil	-.11	-.03	.04	-.07	.02	.10	.68	.41	-.20	-.13	-.05	-.30	-.22	-.14	2.74	.10		
Ath	-.19	-.12	-.05	-.12	-.04	.05	2.07	.15	-.21	-.14	-.07	-.20	-.12	-.03	.17	.68		
Mech	-.07	.00	.08	-.06	.02	.11	.12	.73	-.29	-.22	-.15	-.29	-.21	-.12	.08	.78		
I	-.01	.06	.14	-.06	.03	.12	.33	.56	-.26	-.19	-.12	-.31	-.23	-.14	.41	.52		
Sci	.02	.09	.17	-.04	.05	.14	.56	.45	-.25	-.18	-.11	-.31	-.23	-.14	.56	.45		
Math	.01	.09	.16	.02	.10	.19	.07	.79	-.12	-.05	.03	-.15	-.06	.03	.06	.81		
MedSci	-.01	.06	.14	-.11	-.02	.07	2.06	.15	-.24	-.17	-.09	-.30	-.22	-.13	.76	.38		
A	-.16	-.08	-.01	-.24	-.16	-.07	1.80	.18	-.22	-.15	-.08	-.20	-.12	-.03	.36	.55		
MuDra	-.13	-.05	.02	-.25	-.17	-.08	3.92	.05	-.20	-.12	-.05	-.20	-.11	-.03	.04	.84		
Art	-.16	-.08	-.01	-.22	-.14	-.05	.87	.35	-.21	-.14	-.07	-.21	-.13	-.04	.04	.85		
ApArt	-.17	-.06	.05	-.30	-.16	.00	1.02	.31	-.29	-.19	-.08	-.30	-.16	.00	.12	.73		
Wri	-.11	-.04	.04	-.17	-.09	.00	.69	.41	-.17	-.09	-.02	-.12	-.03	.06	1.09	.30		
Cul	-.08	.03	.14	-.20	-.04	.11	.52	.47	-.06	.05	.16	-.21	-.06	.10	1.22	.27		
S	-.07	.01	.08	-.06	.03	.11	.09	.76	-.03	.05	.12	-.11	-.02	.07	1.30	.25		
Tea	-.12	-.05	.03	-.07	.02	.11	1.28	.26	-.03	.04	.12	-.11	-.02	.06	1.26	.26		
SocSer	-.08	.00	.07	-.10	-.01	.08	.02	.88	-.05	.02	.09	-.08	.01	.09	.06	.81		
MedSer	.03	.10	.18	-.16	-.07	.02	9.00	<.01	-.07	-.09	-.02	-.29	-.20	-.12	3.71	.05		
Rel	.06	.14	.21	.05	.13	.22	.00	.95	.01	.08	.15	-.02	.07	.16	.02	.90		
E	-.16	-.08	-.01	-.13	-.05	.04	.36	.55	-.11	-.03	.04	-.17	-.08	.01	.66	.42		
PubSpk	-.16	-.08	-.01	-.16	-.07	.02	.03	.86	-.18	-.11	-.04	-.14	-.05	.04	1.09	.30		
LawPol	-.11	-.04	.04	-.09	-.01	.08	.30	.58	-.19	-.12	-.04	-.15	-.06	.03	.85	.36		
Merch	-.13	-.06	.02	-.11	-.03	.06	.27	.60	-.06	.02	.09	-.13	-.05	.04	1.23	.27		
Sale	-.15	-.08	.00	-.18	-.09	-.01	.10	.76	-.06	.02	.09	-.17	-.08	.01	2.90	.09		
OrgMgmt	-.06	.01	.09	-.06	.03	.12	.09	.77	-.08	.00	.07	-.13	-.05	.04	.60	.44		
C	.09	.16	.23	.09	.18	.26	.13	.72	-.03	.05	.12	-.02	.07	.15	.12	.73		
Data	-.03	.08	.19	-.10	.05	.21	.08	.78	-.09	.02	.13	-.04	.11	.26	.96	.33		
Comp	-.10	.01	.12	-.20	-.05	.10	.43	.51	-.14	-.03	.08	-.15	.01	.16	.14	.71		
OffSer	.07	.15	.22	.02	.11	.19	.37	.54	.05	.12	.20	.00	.08	.17	.49	.49		

Note. Decimals omitted for correlations (U, r, L). $n = 709$ females; $n = 521$ males except for BISs new to the

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(table continues)

Table 3.5, cont.

	Traditionalism									Absorption								
	Females			Males			ANOVA			Females			Males			ANOVA		
	L	r	U	L	r	U	Var	p	L	r	U	L	r	U	Var	p		
R	-13	-.05	02	05	14	22	1.77	<.01	17	24	31	-.01	08	17	7.77	<.01		
Ag	-.03	05	12	12	20	28	7.36	<.01	05	13	20	02	11	20	.07	.79		
Nat	-.08	-.01	07	-.03	06	14	1.08	.30	23	30	37	13	21	29	2.76	.10		
Mil	-.04	04	11	07	16	24	4.54	.03	-.01	07	14	-.04	05	14	.08	.78		
Ath	04	11	18	07	15	24	.56	.46	-.10	-.03	05	-.13	-.05	04	.13	.72		
Mech	-.14	-.06	01	03	11	12	8.94	<.01	14	21	28	-.04	05	14	7.52	<.01		
I	-.12	-.04	03	-.08	01	09	.68	.41	15	22	29	05	13	22	2.36	.12		
Sci	-.15	-.07	00	-.07	02	10	2.31	.13	14	21	28	02	11	19	3.54	.06		
Math	02	10	17	-.01	08	16	.10	.76	-.03	04	12	-.14	-.06	03	2.80	.09		
MedSci	-.08	-.01	07	-.02	07	16	1.88	.17	02	09	16	01	10	19	.03	.86		
A	-.20	-.13	-.06	-.30	-.22	-.14	2.61	.11	40	46	51	34	42	49	.78	.38		
MuDra	-.14	-.07	00	-.27	-.19	-.11	4.36	.04	35	42	48	31	39	46	.32	.57		
Art	-.17	-.10	-.03	-.29	-.21	-.13	3.87	.05	35	42	48	27	35	42	1.88	.17		
ApArt	-.22	-.12	-.01	-.20	-.05	11	.51	.47	25	35	44	20	34	47	.01	.93		
Wri	-.23	-.16	-.09	-.30	-.22	-.13	.90	.34	29	35	42	21	30	37	1.25	.26		
Cul	03	14	25	00	15	30	.01	.93	03	14	24	11	26	40	1.63	.20		
S	17	24	31	04	12	21	4.47	.03	02	09	17	07	15	24	1.09	.30		
Tea	02	10	17	-.10	-.01	08	3.47	.06	01	09	16	07	15	24	1.33	.25		
SocSer	05	12	19	-.10	-.01	08	5.14	.02	06	13	20	10	19	27	1.06	.30		
MedSer	05	12	20	00	08	17	.50	.48	-.03	04	12	05	14	22	2.58	.11		
Rel	30	36	43	24	32	39	.81	.37	03	11	18	01	10	18	.03	.87		
E	-.03	05	12	04	12	21	1.73	.19	01	08	16	00	09	17	.00	.95		
PubSpk	-.11	-.03	04	-.04	04	13	1.71	.19	04	12	19	09	17	26	.94	.33		
LawPol	-.20	-.12	-.05	-.10	-.02	07	3.45	.06	-.02	06	13	-.02	07	16	.04	.84		
Merch	-.02	06	13	-.02	07	15	.01	.91	00	08	15	-.02	06	15	.05	.83		
Sale	-.03	04	11	03	11	20	1.56	.21	-.08	00	07	-.03	06	15	1.18	.28		
OrgMgmt	01	09	16	05	14	22	.84	.36	-.06	01	09	-.04	05	13	1.74	.19		
C	05	13	20	06	15	23	.14	.71	-.06	01	08	-.13	-.05	04	.98	.32		
Data	-.09	02	13	-.03	13	28	1.33	.25	-.06	05	16	-.23	-.08	08	1.86	.17		
Comp	-.19	-.08	03	-.02	14	29	5.13	.02	-.07	04	15	-.12	04	19	.00	.99		
OffSer	05	12	20	-.01	08	16	.63	.42	-.11	-.03	04	-.07	02	10	.70	.40		

Note. Decimals omitted for correlations (U, r, L). $n = 709$ females; $n = 521$ males except for BISs new to the

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R=Realistic; I=Investigative; A=Artistic; S=Social; E=Enterprising; C=Conventional. See Table 1.5 for a complete list of SII BISs. Significance testing: p -values $<.01$ are in bold.

For easier viewing, Table 3.6 (Females) and Table 3.7 (Males) display the correlation point estimates only. In these tables (as in Table 3.2 for the combined sample), correlation estimates $\geq .20$ and greater (considered “meaningful”) are in bold print, and correlations $\geq .30$ and greater (considered “substantial”) are also italicized. In addition, correlations listed with an asterisk (*) indicate locations of statistical significance for sex differences ($p < .01$).

For the females (see Table 3.6 below; $n = 709$), 51 correlations were considered meaningful at $r \geq .20$ (in bold print). Of these 51 correlations, 15 were considered substantial at $r \geq .30$ (in italics). For the males (see Table 3.7 below; $n = 521$), 60 correlations were considered meaningful at $r \geq .20$ (in bold print). Of these 60 correlations, 16 were considered substantial at $r \geq .30$ (in italics). At a glance, one can see from Table 3.6 and Table 3.7 that the number and locations of the most substantial interest-personality correlations (i.e., $r_s \geq .30$) are similar for the males and females, and are consistent with the substantial correlations previously discussed for the combined sample (e.g., Absorption with Artistic interest scales, Social Potency with Enterprising interest scales, Positive Affectivity with the Social GOT, and Traditionalism with the Religious Activities BIS). For less substantial meaningful correlations (r_s ranging from $.20$ to $.29$), the male sample yielded a slightly greater number of interest-personality correlations than did the women (44 versus 36). Four main areas of female-male differences in the occurrence of moderate correlations ($.20 - .29$) are suggested by visual observation of the tables. For the men (but not women), Harm Avoidance (HA) was negatively correlated with several Investigative (I) interests; Constraint (CT) was negatively correlated with several Artistic (A) interests; and Traditionalism (TRA) was negatively correlated with several Artistic (A) interests. For the women (but not men), Social Closeness (SC) was positively correlated with several Enterprising (E) interests. In spite of these observable differences, the discussion in the subsequent section, *Meaningful Sex Differences among SII-MPQ Correlations*, reveals that none of the correlations in these four areas was statistically significant at $p < .01$. Thus, these differences are not considered to be indicators of meaningful overall sex differences in the way interests and personality converge.

Table 3.6

Pearson Product-Moment Correlations for SII Scales and MPQ Scales—Female Sample (n = 709)

	PA	WB	SP	ACH	SC	NA	ALI	AGG	SR	CT	CTL	HA	TRA	ABS
R	12	04	-05	16	-18	05	00	04	-08	-14	-03	-29	*-05	*24
Ag	11	12	-02	06	-03	-03	-04	-01	-11	-14	-11	-22	*05	13
Nat	11	04	-06	10	-09	05	-05	-03	-01	-10	-03	-22	-01	<i>30</i>
Mil	07	01	05	13	-12	09	02	12	01	-05	-03	-13	04	07
Ath	21	19	16	14	17	-07	-09	05	-11	-08	-12	-14	11	-03
Mech	10	04	-08	16	-19	07	04	01	-05	-08	00	-22	-06	*21
I	19	05	01	26	-04	01	-03	-08	-05	-02	06	-19	-04	22
Sci	11	01	-07	21	-12	05	01	-07	-01	-01	09	-18	-07	21
Math	15	12	-02	21	06	-06	-06	-09	-09	08	09	-05	10	04
MedSci	11	01	*03	15	03	01	-04	-02	-02	-02	06	-17	-01	09
A	19	07	06	*09	-10	07	-06	-03	02	-16	-08	-15	-13	46
MuDra	23	11	11	*07	00	04	-07	-04	-02	-12	-05	-12	-07	42
Art	12	03	-02	03	-08	10	-01	-02	05	-13	-08	-14	-10	42
AppArt	14	04	-05	12	-07	00	-08	-11	-03	-14	-06	-19	-12	35
Wri	17	03	09	*13	-11	04	-05	-07	-01	-12	-04	-09	-16	35
Cul	22	20	06	14	14	*-11	*-21	-10	-08	07	03	05	14	14
S	31	25	15	19	28	-10	-08	-20	-10	13	01	05	24	09
Tea	20	16	09	15	17	-10	-09	-19	-08	05	-05	04	10	09
SocSer	25	17	13	15	23	-05	-04	-15	-05	07	00	02	12	13
MedSer	09	07	*-05	11	08	01	02	-06	-01	*09	*10	-09	12	04
Rel	19	17	-02	14	08	-07	-08	-24	-07	24	14	08	36	11
E	28	16	34	11	23	00	-02	08	-06	-05	-08	-03	05	08
PubSpk	41	21	51	24	19	-07	-08	01	-16	-11	-08	-11	-03	12
LawPol	31	12	40	*24	12	-06	*-10	06	-11	-12	-04	-12	-12	06
Merch	23	13	27	10	21	02	00	07	-01	-01	-06	02	06	08
Sale	17	10	27	01	21	02	04	09	-03	-03	-08	02	04	00
OrgMgmt	31	19	36	18	21	-03	-04	04	-08	03	01	00	09	01
C	11	10	-01	12	07	02	00	-02	00	16	16	05	13	01
Data	14	16	05	08	08	-04	-04	-01	-07	05	08	02	02	05
Comp	03	08	-06	00	-03	-01	01	02	-04	-04	01	-03	-08	04
OffSer	-01	06	-10	00	04	02	01	-02	04	17	15	12	12	-03

Note. Decimals omitted. For BISs new to the 1994 Strong (ApArt, Comp, Cul, and Data), $n = 322$ college students. Correlations .20 and greater are in bold print. Correlations .30 and greater are also italicized.

*Indicates correlation that is significantly different than the correlation in the male sample (ANOVA $p < .01$).

For BISs that received a new name in the 1994 Strong, the 1994 name was used above. Abbreviations for SII Scales: R=Realistic; I=Investigative; A=Artistic; S=Social; E=Enterprising; C=Conventional. See Table 1.5 for a complete list of BISs. Abbreviations for MPQ Scales: PA = Positive Affectivity; WB = Well Being; SP = Social Potency; ACH = Achievement; SC = Social Closeness; NA = Negative Affectivity; ALI = Alienation; AGG = Aggression; SR = Stress Reaction; ABS = Absorption; CT = Constraint; CTRL = Control; HA = Harm Avoidance; TRA = Traditionalism.

Table 3.7

Pearson Product-Moment Correlations for SII Scales and MPQ Scales—Male Sample (n = 521)

	PA	WB	SP	ACH	SC	NA	ALI	AGG	SR	CT	CTL	HA	TRA	ABS
R	.19	.15	.08	.18	-.07	.04	.01	.08	-.07	-.05	.00	-.28	*.14	*.08
Ag	.14	.11	.04	.11	-.02	.08	.01	.09	-.01	-.04	-.06	-.22	*.20	.11
Nat	.10	.13	-.02	.04	-.10	.02	-.06	-.04	-.08	-.08	-.02	-.20	.06	.21
Mil	.17	.12	.14	.05	-.01	.07	.03	.16	-.04	-.05	.02	-.22	.16	.05
Ath	.24	.21	.25	.12	.20	-.01	.00	.19	-.10	-.02	-.04	-.12	.15	-.05
Mech	.15	.11	.04	.20	-.08	.05	.02	.06	-.04	.00	.02	-.21	.11	*.05
I	.19	.11	.13	.19	-.08	.03	-.02	.00	-.07	-.06	.03	-.23	.01	.13
Sci	.11	.05	.01	.20	-.16	.05	.02	-.01	-.03	-.03	.05	-.23	.02	.11
Math	.10	.05	.05	.19	-.05	.00	.00	.02	-.06	.09	.10	-.06	.08	-.06
MedSci	.19	.12	*.19	.15	-.03	.07	.03	.09	-.06	-.07	-.02	-.22	.07	.10
A	.11	.03	.13	*.07	-.04	.12	.04	-.01	.12	-.24	-.16	-.12	-.22	.42
MuDra	.12	.07	.14	*.10	.00	.07	.02	-.02	.05	-.25	-.17	-.11	-.19	.39
Art	.06	.02	.06	-.08	-.06	.10	.03	-.01	.09	-.22	-.14	-.13	-.21	.35
AppArt	.13	.13	.17	-.11	-.08	.16	.09	.04	.09	-.21	-.16	-.16	-.05	.34
Wri	.03	-.01	.07	*.08	-.07	.07	-.05	-.05	.13	-.16	-.09	-.03	-.22	.30
Cul	.28	.26	.27	.01	.07	.15	*.14	.14	-.03	-.01	-.04	-.06	.15	.26
S	.31	.23	.27	.10	.23	.00	.01	-.07	.00	.06	.03	-.02	.12	.15
Tea	.18	.15	.11	.08	.13	-.02	-.04	-.10	-.02	.01	.02	-.02	-.01	.15
SocSer	.23	.19	.23	.01	.19	.00	.01	-.08	-.02	-.01	-.01	.01	-.01	.19
MedSer	.16	.09	*.16	.08	.01	.10	.10	.08	-.02	*.07	*.07	-.20	.08	.14
Rel	.15	.09	.05	.06	.12	-.03	-.04	-.21	-.03	.23	.13	.07	.32	.10
E	.32	.23	.42	.08	.16	.10	.11	.20	-.06	-.02	-.05	-.08	.12	.09
PubSpk	.36	.21	.49	.11	.16	.08	.05	.07	-.01	-.05	-.07	-.05	.04	.17
LawPol	.26	.13	.40	*.09	.08	.08	*.06	.10	.00	-.04	-.01	-.06	-.02	.07
Merch	.22	.16	.34	.03	.10	.10	.11	.17	-.03	-.02	-.03	-.05	.07	.06
Sale	.26	.19	.36	.02	.16	.07	.07	.19	-.06	-.06	-.09	-.08	.11	.06
OrgMgmt	.31	.21	.39	.11	.16	.06	.09	.12	-.06	.05	.03	-.05	.14	.05
C	.12	.08	.09	.14	.01	.06	.11	.00	-.02	.22	.18	.07	.15	-.05
Data	.06	.07	.04	.10	-.08	.11	.17	.03	.00	.20	.05	.11	.13	-.08
Comp	.08	.06	.07	.08	.00	.14	.18	-.01	.08	.10	-.05	.01	.14	.04
OffSer	.03	.00	.00	.05	-.02	.09	.13	-.02	.04	.16	.11	.08	.08	.02

Note. Decimals omitted. For BISs new to the 1994 Strong (ApArt, Comp, Cul, and Data), $n = 164$ college students. Correlations .20 and greater are in bold print. Correlations .30 and greater are also italicized.

*Indicates correlation that is significantly different than the correlation in the female sample (ANOVA $p < .01$).

For BISs that received a new name in the 1994 Strong, the 1994 name was used above—i.e., OrgMgmt

(previously BusMgmt) and OffSer (previously OffPrac). Abbreviations for SII Scales: R=Realistic;

I=Investigative; A=Artistic; S=Social; E=Enterprising; C=Conventional. See Table 1.5 for a complete list of

BISs. Abbreviations for MPQ Scales: PA = Positive Affectivity; WB = Well Being; SP = Social Potency; ACH

= Achievement; SC = Social Closeness; NA = Negative Affectivity; ALI = Alienation; AGG = Aggression; SR

= Stress Reaction; ABS = Absorption; CT = Constraint; CTRL = Control; HA = Harm Avoidance; TRA =

Traditionalism.

Analysis of Sex as a Moderator

Analysis of Variance (ANOVA) calculations were run to assess the impact of sex as a possible moderator of interest-personality correlations. Significance levels for the magnitude of between-sex variance were used to determine statistical significance of differences between females and males for each of the 434 pairwise correlations between interest (SII) and personality (MPQ) scales. The ANOVA p -values are listed in the final (far right) column under each MPQ scale listed in Table 3.5 (above). Using $p < .01$ as the criterion for statistical significance, only 15 of the 434 correlations were significantly different for females and males. These p -values are in bold print in Table 3.5, and correlation estimates affiliated with ANOVA p -values $< .01$ for significant sex differences are also indicated with an asterisk (*) in Table 3.6 (F) and Table 3.7 (M) above. For additional clarity, Table 3.8 (below) lists the 15 statistically significant ($p < .01$) female/male differences in descending order by the larger effect size (in bold) of the two sex groups.

Meaningful Sex Differences among SII-MPQ Correlations

For the first five correlations listed in Table 3.8 (below), the correlation estimate for one of the sex groups is $r \geq .20$, indicating a correlation that could be considered meaningful (i.e., sharing 4% or more variation). Although these sex differences warrant discussion, it should be noted that none of these differences reflects interest-personality overlap that exceeds 6% for either sex group; thus, substantial clinical meaningfulness for sex differences is not indicated.

Three of the correlations that equal or exceed .20 for one sex group but not the other involve Realistic interests. Of these three, the two largest effect sizes involve correlations between Realistic interest scales and the Absorption (ABS) personality scale. First, the strongest of these correlations was between the Realistic GOT and ABS for females (.24). For males, this correlation was .08. The correlation estimate for the total sample was .09, indicating that the weak relation for males rendered the moderate relation for females undetectable in the combined analyses. Secondly, ABS was also positively correlated with the Mechanical Activities BIS (R theme) for females. Once again, the moderate correlation for females (.21) was not revealed in the combined analyses (.04) due to the influence of the weak correlation for the males (.05). The third correlation involving Realistic interests was the positive correlation between the Agriculture BIS with Traditionalism (TRA), which was significantly stronger for males than females. For males, the correlation between Agriculture and TRA was .20, compared with .05 for females. Thus, the meaningful correlation for the males is not discernable by viewing only the correlation for the total sample (.12).

Table 3.8

*Significant Sex Differences among Correlations between SII and MPQ Scales—
In Descending Order of the Larger Effect Size (r) of the Two Sex Groups*

SII Scale	MPQ Scale	Females			Males		
		<i>r</i>	L	U	<i>r</i>	L	U
Law/Politics (E)	Achievement (PA)	.24	.17	.31	.09	.01	.18 *
-R-	Absorption	.24	.17	.31	.08	-.01	.17 *
Culinary Arts (A)	Alienation (NA)	-.21	-.31	-.10	.14	-.01	.29 **
Mechanical Activities (R)	Absorption	.21	.14	.28	.05	-.04	.14 *
Agriculture (R)	Traditionalism (CT)	.05	-.03	.12	.20	.12	.28 *
Medical Science (I)	Social Potency (PA)	.03	-.05	.10	.19	.10	.27 *
Medical Service (S)	Social Potency (PA)	-.05	-.13	.02	.16	.07	.24 **
Culinary Arts (A)	NA	-.11	-.22	.00	.15	.00	.30 *
-R-	Traditionalism (CT)	-.05	-.13	.02	.14	.05	.22 *
Writing (A)	Achievement (PA)	.13	.06	.20	-.08	-.16	.01 **
Music/Dramatics (A)	Achievement (PA)	.07	.00	.15	-.10	-.19	-.02 *
Medical Service (S)	Control (CT)	.10	.03	.18	-.07	-.16	.02 *
Law/Politics (E)	Alienation (NA)	-.10	-.17	-.02	.06	-.03	.14 *
-A-	Achievement (PA)	.09	.01	.16	-.07	-.15	.02 *
Medical Service (S)	CT	.09	.01	.16	-.07	-.15	.02 *

Note. The larger effect size (*r*) of the female and male group is in bold. Sample size: *n* = 709 F, 521 M, except for BISs new to the 1994 SII (ApArt, Comp, Culinary, Data), for which *n* = 322 F, 164 M college students. Higher-order scales are abbreviated: A=Artistic; NA=Negative Affectivity; R=Realistic; CT=Constraint; I=Investigative; PA=Positive Affectivity; S=Social; E=Enterprising.

** *p* < .001; * *p* < .01.

The fourth and fifth sex differences listed in Table 3.8 (above) reflect the correlation of Law/Politics (E Theme) with Achievement (ACH), and the correlation of Culinary Arts (A Theme) with Alienation (ALI). First, a moderate connection between interests in law and politics and an achieving personality style appears to exist among females (.24) but not males (.09). (The correlation estimate for the total sample was .17.) The widest sex difference among correlations between interest scales and personality scales was for the correlation between the Culinary Arts BIS and ALI. For females, there was a meaningful negative relation (-.21) between culinary interests and an alienated personality style. For males, however, the correlation was positive (.14), and the moderate negative

correlation for females was thus not detectable by viewing the combined sample correlation (-.14). (Note: Because Culinary Arts is a BIS new to the 1994 SII, this sex difference reflects only 322 female and 164 male college students. Consequently, this sex difference may not necessarily generalize to the adolescents and adults in the larger sample.)

In spite of the statistically significant ANOVA p -values for the remaining 10 correlations listed in Table 3.8 (above), these differences are less meaningful given that the correlation is not particularly strong for either sex. For example, the ANOVA test for the correlation of the Music/Dramatics BIS with the MPQ Achievement scale indicates that the difference between .07 (F) and -.10 (M) is statistically significant at $p < .01$. However, this difference is not interesting clinically because both estimates are nearly an equal distance from zero, and neither indicates a meaningful relation in either the positive or negative direction (i.e., sharing .5% overlap for females and 1% overlap for males.) For this reason, these 10 sex differences will not be discussed further.

Summary of Sex as a Moderator

Overall, sex was not a substantial moderator of interest-personality relations. Of the 434 total pairwise comparisons, only 15 statistically significant differences ($p < .01$) were found between females and males. Of these 15, only five involved a correlation that was $\geq .20$ for one sex group but not the other. Of these five correlations, none reached the .30 criteria used to indicate substantial convergence.

The Realistic domain is notable for containing three of the five meaningful SII-MPQ correlations that were moderated by sex. For females, the Realistic GOT and the Mechanical Activities BIS were positively associated with Absorption (ABS), whereas this was not the case for males. For males, the Realistic GOT was positively affiliated with Traditionalism (TRA), which was not the case for females. In addition, interests in the Law/Politics BIS (Enterprising domain) related positively with Achievement (ACH) for females, but minimally for males. And finally, interests in Culinary Arts (Artistic domain) were affiliated negatively with Alienation (ALI) in female college students, but positively in male college students.

Analysis of Age as a Moderator

Analysis of Variance (ANOVA) calculations were run to evaluate age as a possible moderator of interest-personality correlations. Three age groups were compared: (1) gifted adolescents ($n = 1113$; Schmidt, 1998; Larson & Borgen, 2002); (2) college students ($n = 490$; Staggs et al., 2003; Larson, 2003); and, (3) adult career clients ($n = 420$; Morfitt, 1998). Significance levels for the magnitude of between-group variance were used to determine statistical significance of age group differences for each of 84 pairwise correlations between SII GOTs (6) and MPQ personality

scales (14). Using $p < .01$ as the criterion for statistical significance, only nine of the 84 correlations were significantly different between age groups. These nine correlations are listed in Table 3.9 below, in descending order by the size of the total variance.

Table 3.9

*Significant Age Group Differences among Correlations (r) between SII GOTs and MPQ Scales—
In Descending Order of Variance*

SII GOT	MPQ Scale	Variance		Adol	Coll	Adult	Total
R	Stress Reaction (NA)	15.34	**	.02	-.19	-.01	-.04
R	Harm Avoidance (CT)	13.95	**	-.25	-.44	-.28	-.31
R	Social Closeness (PA)	13.58	*	-.06	-.26	-.14	-.13
E	Stress Reaction (NA)	13.90	*	.09	-.06	-.09	.02
A	Aggression (NA)	12.41	*	-.18	-.12	.02	-.13
I	Achievement (PA)	11.79	*	.33	.21	.16	.26
A	Traditionalism (CT)	11.91	*	-.04	-.11	-.23	-.10
A	CT	10.48	*	-.05	-.11	-.24	-.11
S	Harm Avoidance (CT)	9.39	*	.14	.16	-.02	.11

Note. $n = 1113$ gifted adol, 490 college students, 420 adult career clients, 2023 total. Correlations $\geq .20$ are in bold. Correlations $\geq .30$ are also italicized. Rows that contain $r \geq .20$ for at least one age group are shaded. MPQ higher-order factors are abbreviated: NA=Negative Affectivity; CT = Constraint; PA = Positive Affectivity. SII GOTs are abbreviated: R = Realistic; E = Enterprising; A = Artistic; I = Investigative; S = Social.

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

Meaningful Age Differences among SII/MPQ Correlations

Consistent with the previous discussion of sex differences, only significant age differences that involve a correlation estimate (r) of .20 or greater for at least one age group are discussed as meaningful. These five correlations are shaded in Table 3.9 (above), and are discussed below in the order they are listed in the table. Although the three groups may legitimately be compared based on age differences, it should be noted that these groups also represent distinct samples (i.e., two samples of gifted adolescents, two samples of college students, and one sample of adult career clients). Thus, the present comparison is distinct from an age analysis of all individuals from a single randomized

sample or from a large combined sample in which demographic variables other than age are controllable. Consequently, the reader should bear in mind that differences observed among the three groups may conceivably be partially attributable to factors other than the obvious age differences (e.g., IQ, work experience, socio-economic status).

Realistic GOT with Harm Avoidance. The negative correlation between the Realistic GOT and Harm Avoidance (HA) was significantly stronger for the college student sample (-.44) than for the gifted adolescent sample (-.25) or the adult career client sample (-.28). This meaningful negative correlation was observable in the combined sample (-.31) without consideration of age, but was particularly strong among the college students sampled.

Realistic GOT with Social Closeness. Whereas a meaningful negative correlation (-.26) was indicated between the Realistic GOT and Social Closeness (SC) for the college student sample, the correlations for the gifted adolescent sample (-.06) and the adult career client sample (-.14) were significantly weaker. The correlation for the combined sample was a modest -.13.

Investigative GOT with Achievement. For the correlation between the Investigative GOT and Achievement (ACH), the strongest correlation was for the gifted adolescent sample (.33), followed by the college student sample (.21), and then by the adult career client sample (.16). Whereas the correlation for the total sample (.26) indicates a meaningful relation between Investigative interests and an achieving personality style, this correlation was particularly substantial for the gifted adolescents, but was not meaningful for the adult career clients.

Artistic GOT with Traditionalism. Among the adult career clients surveyed, a meaningful negative correlation (-.23) was observed between the Artistic GOT and a traditional personality style. This correlation was unique to the adults sampled, and was not indicated by the correlation for the total combined sample (-.10). The correlations for the gifted adolescent sample (-.04) and the college student sample (-.11) were significantly weaker than the correlation for the adult career clients.

Artistic GOT with Constraint. Constraint (CT) is the MPQ higher-order scale affiliated with the Traditionalism scale (TRA) discussed above. Similar to the negative correlation between the Artistic GOT and TRA, the adult group yielded a unique negative correlation between the Artistic GOT and CT (-.24). This correlation was significantly weaker in the gifted adolescent sample (-.05) and in the college student sample (-.11), and thus in the total sample (-.11) as well.

Summary of Age as a Moderator

In general, age did not appear to moderate substantially correlations between interests and personality. Of the three age groups compared, no one age group consistently yielded I-P correlations that were stronger or weaker than the other two groups, and no instances of one age group yielding a

strong correlation in the opposite direction of the other age groups were observed. Although nine of the 84 correlations indicated a statistically significant effect for age, only three of these effects revealed a meaningful correlation for one age group that was not already indicated as a meaningful correlation for the total sample. These three correlations were the Realistic GOT with Social Closeness for the college student sample (-.26), the Artistic GOT with Traditionalism for the adult career client sample (-.23), and the Artistic GOT with Constraint for the adult career client sample (-.24). Although they are worth noting, none of these three effects are considered clinically substantial using the $r \geq .30$ criteria.

Summary of Results

Of the 434 pairwise correlations between 31 interest scales (SII: 6 GOTs and 25 BISs) and 14 personality scales (MPQ: 11 primary and 3 higher-order scales) for a sample of 2023 individuals, a total of 13 correlations were .30 and greater (9% or more shared variance, considered substantial), and a total of 38 correlations were .20-.29 (4%-8% shared variance, considered meaningful). Among the three higher-order personality domains, PA and its affiliated primary scales were most strongly connected with interests in general (24 correlations .20-.29, and six correlations $\geq .30$). Although PA correlated meaningfully with both the Social and Enterprising GOTs, the examination of the specific scales within these broad domains defined these relations more clearly: Well Being and Social Closeness were more strongly affiliated with Social interests (i.e., Social GOT and Social Service BIS), whereas Social Potency yielded substantial, robust correlations with Enterprising interests ($r_s \geq .30$ with the GOT and three BISs).

Aside from the correlations between Social Potency and Enterprising interests, the other most substantial group of correlations in the matrix occurred between the Absorption primary scale (affiliated with both NA and PA) and Artistic interests ($r_s \geq .30$ with the GOT and four BISs). The remaining substantial correlations in the study were the .37 correlation between Traditionalism (affiliated with CT) and Religious Activities (a Social BIS), and the -.31 correlation between Harm Avoidance (also affiliated with CT) and the Realistic GOT. Among the three higher-order MPQ domains, NA yielded the fewest meaningful correlations with interest scales (i.e., five correlations $\geq .20$), and each of these correlations involved the Aggression primary factor. Aggression correlated negatively (-.22 to -.24) with four Social BISs, and positively with the Athletics BIS (.21).

Among the six major SII themes, the Conventional and Investigative domains yielded fewer meaningful correlations with personality scales than the other four RIASEC domains. The Conventional domain yielded only one correlation $\geq .20$ with a personality scale (i.e., $r = .20$ for Office Services with CT). The Investigative domain yielded five correlations $\geq .20$ with personality

scales, but none were .30 or stronger. Namely, the Investigative GOT correlated .20 with PA and .27 with Achievement; the Science and Math BISs correlated .21 and .22 with Achievement, respectively; and, the Science BIS correlated -.20 with Harm Avoidance.

Overall, neither sex nor age was a substantial moderator of interest-personality correlations. Of the 434 total correlations compared for females and males, five statistically significant differences ($p < .01$) involved a correlation that was $\geq .20$ for one sex group but not for the other, but none involved more substantial correlations of .30 or greater. For females, the Realistic GOT and the Mechanical Activities BIS were positively associated with Absorption (.24, .21, respectively), whereas this was not the case for males (.08, .05, respectively). For males, the Agriculture BIS (R theme) was positively affiliated with Traditionalism (.20), which was not the case for females (.05). Interests in Law/Politics correlated positively with Achievement for females (.24), but minimally for males (.09). And finally, Culinary interests were affiliated negatively with Alienation in female college students (-.21), but positively in male college students (.14).

Of the three age groups compared (gifted adolescents, college students, and working adults), no one age group consistently yielded interest-personality associations that were stronger or weaker than the other two groups, and there were no instances of one age group yielding a substantial correlation in the opposite direction of the other age groups. Although nine of the correlations indicated a statistically significant effect for age, only three of these effects revealed a meaningful correlation ($r \geq .20$) for one age group that was not already indicated as a meaningful correlation for the total sample. These three correlations were Realistic with Social Closeness for college students (-.26), Artistic with Traditionalism for adult career clients (-.23), and Artistic with Constraint for adult career clients (-.24). None of these correlations were considered substantial using the $r \geq .30$ criterion.

Table 3.10 (below) presents a synthesis of the combined analyses with findings from the sex and age group analyses. In Table 3.10, the correlation estimate for the combined sample is replaced with the correlation estimate of a specific sex group or age group in instances of a statistically significant difference ($p < .01$) that involves a correlation $\geq .20$ for one group that is otherwise not indicated as $\geq .20$ by the estimate for the total sample. (In other words, the four sex differences and three age differences detailed in the previous two summary paragraphs are noted in the table.) For example, the .24 correlation between the Realistic GOT and Absorption for females is entered in place of the .09 correlation indicated for the total sample. Substituted values that indicate age or sex differences are italicized in Table 3.10.

Table 3.10

Synthesis of Pearson Product-Moment Correlations for Strong Scales with MPQ Scales—With Meaningful Age and Sex Group Differences Noted

	PA	WB	SP	ACH	SC	NA	ALI	AGG	SR	CT	CTL	HA	TRA	ABS
R	10	07	03	12	-26C	07	03	15	-04	-15	-06	-31	03	24F
Ag	12	13	01	08	01	02	-04	05	-07	-09	-10	-21	20M	11
Nat	15	16	-01	11	01	-04	-11	-11	-02	-03	01	-11	07	26
Mil	09	04	10	08	-09	12	06	21	-03	-11	-06	-24	06	05
Ath	24	20	20	09	21	00	-06	18	-12	-08	-10	-15	12	-06
Mech	06	03	-01	12	-16	08	06	15	-07	-13	-05	-28	00	21F
I	20	12	08	27	-03	-02	-05	-02	-05	-05	07	-19	00	15
Sci	10	05	-02	21	-13	03	00	02	-05	-05	06	-20	-02	09
Math	12	07	02	22	-03	-01	00	01	-08	06	10	-07	08	-05
MedSci	19	12	11	18	07	00	-05	02	-04	-02	05	-14	03	09
A	17	11	11	06	03	01	-06	-13	06	-24A	-06	-06	-23A	44
MuDra	20	13	14	05	09	-01	-06	-15	07	-07	-04	-03	-04	40
Art	11	08	04	00	03	01	-05	-12	09	-09	-06	-05	-09	39
AppArt	14	08	02	05	-06	05	-02	-05	01	-14	-08	-15	-09	35
Wri	14	07	10	09	-01	00	-07	-15	10	-06	-02	-01	-10	35
Cul	21	24	08	07	19	-05	-21F	-13	-01	14	06	16	17	18
S	31	26	17	17	29	-10	-10	-22	-04	17	08	11	22	16
Tea	21	19	09	15	18	-11	-10	-22	-01	10	06	08	09	15
SocSer	24	21	13	10	26	-08	-09	-23	03	11	05	12	10	20
MedSer	18	14	06	13	13	-01	-01	-06	-01	05	05	-07	11	09
Rel	16	15	02	10	12	-08	-08	-24	-01	24	13	09	37	12
E	28	17	36	09	20	05	01	10	02	-03	-06	-05	07	10
PubSpk	37	19	49	18	17	01	-02	02	-04	-06	-05	-08	02	16
LawPol	28	11	41	24F	09	02	-02	10	-05	-09	-01	-11	-07	09
Merch	22	13	29	06	18	04	01	04	03	01	-03	02	05	09
Sale	19	09	29	00	17	07	05	13	-01	-05	-09	-05	05	02
OrgMgmt	29	16	35	14	16	03	01	07	-03	05	04	00	09	05
C	15	10	09	16	06	03	03	03	02	19	17	08	14	00
Data	12	10	08	11	-06	06	10	11	-08	01	03	-07	03	-01
Comp	06	05	02	05	-08	08	12	10	-04	-07	-05	-12	-03	03
OffSer	07	07	00	04	07	03	03	-08	08	20	14	16	12	03

Note. Decimals omitted. For combined-sex correlations, $n = 2023$ except for those involving BISs new to the 1994 SII (i.e., ApArt, Comp, Cul, Data), for which $n = 490$ college students. For sex-specific correlations, $n = 709$ F and 521 M. For age-specific correlations, $n = 1113$ gifted adolescents, 490 college students, 420 adult career clients. Correlations .20 and greater are in bold print, and correlations .30 and greater are also italicized. Correlations that indicate a significant age or sex difference ($p < .01$), and involve an $r \geq .20$ that is not indicated as such in the combined sample, are indicated by the capital letter that symbolizes the specific group: F = female; M = male; G = gifted adolescents; C = college students; A = adults.

IV. DISCUSSION

The purpose of this study was to advance knowledge of convergence between interest and personality domains via synthesis of recent studies that measured this convergence using scales of the Multidimensional Personality Questionnaire (MPQ) and the Strong Interest Inventory (SII). In addition to the increased statistical precision achievable by any meta-analytic study, the present meta-analyses contribute to the body of interest-personality research in several significant ways. By synthesizing studies that administered the MPQ as an alternative to measures of the Big Five, and by including correlations between specific scales of both the SII (i.e., the 25 BISs) and of the MPQ (i.e., the 11 primary factors), a number of substantial interest-personality (I-P) correlations were confirmed that had not been previously identified by studies that assessed common variance using measures of the Big Five and the six GOTs. Furthermore, the use of lower-order scales in the present study clarified and differentiated the nature of several higher-order correlations reported by recent meta-analyses between the six GOTs and the Big Five factors (i.e., Barrick et al., 2003; Larson & Borgen, 2002).

Also noteworthy is the demographic diversity (i.e., gifted adolescents, college students, adult career clients) represented by the individual samples included in this study. When compared with each other, these samples yielded some notable differences in interest-personality correlations. The present study integrates and summarizes findings across these samples, and identifies convergence patterns that occur consistently for a large sample size across demographics such as age, IQ, and work experience. In addition, this study appears to be the first in this area of research to examine statistically both sex and age as possible moderating variables in the way interest and personality scales correlate. Although Larson et al. (2002) statistically analyzed sex differences in their meta-analyses of studies that correlated RIASEC scales with scales of the Five Factor Model (FFM), this author found no previous reports that empirically analyzed the influence of age on interest-personality convergence.

Overview of Principal Findings

The most substantial correlations found in the present study ranged from .30 to .49—reflecting between 9% and 24% shared variance. The strongest correlation (.49) occurred between Social Potency (SP) and the Public Speaking BIS. This correlation represents a larger cluster of meaningful correlations found between SP and Enterprising scales, as SP correlated .29 or above with the Enterprising GOT and all five of the Enterprising BISs. The second strongest correlation in the

study (.44) occurred between Absorption (ABS) and the Artistic GOT—and also represents a cluster of substantial correlations between ABS and four of the five Artistic BISs.

Two of the remaining substantial correlations involved SII GOTs: Harm Avoidance (HA) correlated inversely with the Realistic GOT (-.31), and Positive Affectivity (PA) correlated substantially with the Social GOT (.31). Finally, Traditionalism (TRA) correlated substantially with the Religious Activities BIS (.37). The substantial inverse correlation between HA and the Realistic GOT is particularly noteworthy given that previous Big 5/Big 6 meta-analyses had not reported any meaningful correlations between the Realistic GOT and personality factors.

Among the MPQ higher-order domains, PA and its affiliated primary scales were most strongly connected with interests in general (i.e., 24 correlations .20-.29, and six correlations \geq .30). Although PA correlated meaningfully with both the Social (S) and Enterprising (E) GOTs, the use of both higher-order and lower-order SII and MPQ scales served to define these relations more clearly, and also clarified correlations reported by RIASEC/FFM meta-analyses between Extraversion and both the Social and Enterprising GOTs (Barrick et al., 2003; Larson et al., 2002). Specifically, the Social GOT and two of the Social BISs (Teaching and Social Service) correlated most strongly with PA, Well Being (WB), and Social Closeness (SC), whereas Enterprising scales correlated most substantially with Social Potency (SP).

Regarding divergence between interest and personality domains, NA and its affiliated primary factors yielded the fewest meaningful correlations with interest scales (i.e., five correlations .20-.25). All five of these correlations involved Aggression (AGG), which correlated negatively with four Social BISs, and positively with Athletics. Among the six SII Themes, the Conventional and Investigative domains yielded fewer meaningful correlations with personality than the other four RIASEC domains. Most lacking were meaningful correlations with scales from the Conventional domain, which yielded only one meaningful correlation with a personality scale (i.e., .20 for Office Services with Constraint). Thus, the present findings do not support the idea that individuals with a conscientious, controlled personality style are generally more likely to hold Conventional career interests.

Although the Investigative domain yielded no substantial correlations with personality factors, several correlations represented between 4% and 7% shared variance. Namely, the Investigative GOT correlated with PA (.20) and Achievement (.27); the Science and Math BISs correlated with Achievement (.21 and .22, respectively); and, the Science BIS correlated with Harm Avoidance (-.20). Although moderate, these correlations are noteworthy because none of them were implicated by the previous Big 5/Big 6 meta-analyses (Barrick et al., 2003; Larson et al., 2002). Of

the four major correlations reported by the Big 5/Big 6 meta-analyses, Openness to Experience correlated most strongly with the Artistic GOT, followed by the Investigative GOT. In the present study, Absorption and Artistic interests were substantially correlated, but Absorption did not correlate meaningfully with Investigative interests.

This study also revealed that neither sex nor age appears to be a substantial moderator of interest-personality correlations. Of the 434 total correlations compared for females and males, five statistically significant differences ($p < .01$) involved a correlation that was $\geq .20$ for one sex group but not for the other, but none of these involved more substantial correlations of .30 or greater. Of the three age groups compared (gifted adolescents, college students, and working adults), no one age group consistently yielded interest-personality associations that were stronger or weaker than the other two groups, and there were no instances of one age group yielding a substantial correlation in the opposite direction of the other age groups. Although nine of the correlations indicated a statistically significant effect for age, only three of these effects revealed a meaningful correlation ($r \geq .20$) for one age group that was not already indicated as a meaningful correlation for the total sample, and none of these correlations were considered substantial using the $r \geq .30$ criteria.

Finally, it is noteworthy that some interest and personality scales correlated most strongly at the level of higher-order domains (i.e., GOTs of the SII and MPQ higher-order scales), whereas correlations between other higher-order domains revealed relatively little about the nature of shared variance in comparison with correlations between more specific lower-order scales affiliated with those domains (i.e., BISs of the SII and MPQ primary factors). Thus, the continued use of both higher-order and lower-order scales is recommended for future studies of this kind.

Synthesis of Findings with Relevant Studies of I-P Convergence

Synthesis of the RIASEC/FFM meta-analyses conducted by Larson et al. (2002) and Barrick et al. (2003) indicates clear consensus regarding meaningful convergence of several broad dimensions of interest and personality when using RIASEC and FFM measures. In review, these correlations are as follows (with r s from Larson et al., 2002, listed first, followed by r s from Barrick et al., 2003): (1) Openness with Artistic (.48, .39); (2) Extraversion with Enterprising (.41, .41); (3) Extraversion with Social (.31, .29); and, (4) Openness with Investigative (.28, .25). The broad domains paired in these four relations share between 6% and 23% of their variance.

Blake and Sackett (1999) used a study by Church (1994), as well as data from Tellegen and Waller (in press), to select one MPQ scale that seems best to represent each of the Big Five. Blake and Sackett identified the following five MPQ scales as markers for the Big Five dimensions:

1. Neuroticism—MPQ Stress Reaction;
2. Agreeableness—MPQ Aggression (inversely);
3. Extraversion—MPQ Social Potency;
4. Conscientiousness—MPQ Control;
5. Openness to Experience—MPQ Absorption.

In order to facilitate synthesis of the present results with previous literature, meaningful overlap found between SII scales and MPQ factors in the present study is compared to the primary findings of RIASEC/FFM meta-analyses (listed above), as well as with results of the relevant study by Waller et al. (1995). For a sample of 4,014 middle-aged twins and their spouses, Waller et al. reported correlations between the 11 MPQ primary factors and 25 interest factors that they developed from reviews of the interest literature. Because their interest measure was not structured according to the RIASEC model, it was not included in the current meta-analyses. Unique to the Waller et al. study, about 40% of the items in their interest measure referred to jobs that do not require post-secondary education. Furthermore, in effort to minimize confounds of education and status needs, they also instructed participants to pretend that all jobs yield equal status and pay. Due to the relevant yet diverse nature of Waller et al.'s study, correlations from their study are compared with results of the present meta-analyses when Waller et al.'s occupational interest scales could be plausibly categorized with one of the RIASEC Themes. It should also be noted that Waller et al. reported correlations between interest scales and the MPQ primary factors only; thus, correlations with MPQ higher-order factors (i.e., PA, NA, CT) from the present study could not be compared.

In the following discussion, correlation estimates are generally reported for the combined sample only, but correlations for a specific sex or age group are noted when that group differed significantly ($p < .01$) from comparison groups *and* involved a correlation .20 or greater that was not identified as such by the combined sample. (These correlations are identified in Table 3.10 in the *Results* section.)

Positive Affectivity (PA) and Interests

Of the three major MPQ dimensions, PA clearly related most strongly with interests in general. At the higher-order level, PA correlated most strongly with the Social GOT (.31), but also correlated meaningfully with the Enterprising GOT (.28). Examination of correlations between more specific scales affiliated with the PA, Enterprising, and Social domains clarified the nature of these relations.

Social Potency (SP) and Enterprising interests. The PA-affiliated primary factor, SP, correlated meaningfully (and more strongly than PA) with the Enterprising GOT (.36) and with all

five Enterprising BISs (Sales .29, Merchandising .29, Organizational Management .35, Law/Politics .41, and Public Speaking .49). High scorers on SP are described as forceful and decisive, fond of influencing others, and fond of leadership roles (Tellegen & Waller, in press). As suggested by Blake and Sackett's (1999) choice of SP as the best marker for Extraversion, the SP-Enterprising correlations are consistent with the substantial correlation ($r = .41$) reported by both Larson et al. (2002) and Barrick et al. (2003) between the Enterprising GOT and Extraversion. Meaningful SP-Enterprising correlations were also noted by Waller et al. (1995), who reported the following correlations between SP and three Enterprising-type scales: Politics (.46), Sales (.30), and Law (.37). Furthermore, the relation between Enterprising interests and SP is well-differentiated in the present study in that none of the Enterprising BISs correlated meaningfully with the other three PA-affiliated primary factors—Well Being, Achievement, or Social Closeness—with the exception of a positive meaningful correlation found for females only between Achievement (ACH) and the Law/Politics BIS (.24).

Clarification of PA-Social and Extraversion-Social correlations. In addition to the meaningful correlation between Extraversion and the Enterprising GOT, Larson et al. (2002) and Barrick et al. (2003) reported a meaningful correlation between Extraversion and the Social GOT as well (.31 and .29, respectively). Social Potency (the suggested MPQ marker for Extraversion) did not, however, correlate robustly with Social interests in the present study. Aside from a .24 correlation between SP and the Social GOT for the adult career clients only, meaningful relations between SP and the Social BISs did not occur. Instead, the Social GOT, the Teaching BIS, and the Social Service BIS correlated most strongly with the higher-order dimension of PA (.31, .21, and .24, respectively), and the Social GOT and the Social Service BIS also correlated meaningfully with the “communal” (Tellegen & Waller, in press) PA-affiliated primary factors of Well-Being and Social Closeness (ranging from .21 to .29). Well-Being (WB) is used to describe individuals who have a cheerful disposition, feel good about themselves, and see the future optimistically. The Social Closeness factor (SC) refers to individuals who are sociable, like people, and turn to others for comfort (Tellegen & Waller, in press). In contrast with the Teaching and Social Service BISs, the remaining two BISs in the Social domain—Medical Service and Religious Activities—did not correlate meaningfully with PA or any of the PA-affiliated primary factors in the present study.

The correlations between MPQ scales and Waller et al.'s (1995) occupational scales were similar in nature. Religion (e.g., missionary, medical missionary, evangelist) and Personal Service (i.e., hairdresser, barber, masseur) are the two scales used by Waller et al. that seem most similar to Holland's Social Theme. In Waller et al.'s study, the correlation between Personal Service and SC

was meaningful (.25), but the correlation between Religion and SC was not (.09). These two scales also did not correlate positively in a meaningful way with any of the other PA-affiliated primary factors, but Personal Service correlated meaningfully in the negative direction with SP (-.32). These results attest to the value of using alternative measures and more specific personality and interest scales to clarify the general relations indicated by the RIASEC/FFM meta-analyses for Extraversion with both the Social and Enterprising GOTs.

Achievement (ACH) and Investigative interests. A few other meaningful correlations between PA-affiliated primary scales and SII scales occurred in addition to the substantial correlations mentioned above between PA-affiliated primary scales and interest scales within the Social and Enterprising domains. First, ACH correlated meaningfully with the Investigative GOT (.27) and with two of the three Investigative BISs—Science (.21) and Mathematics (.22). Achievement is defined as the tendency to work hard and enjoy demanding projects (Tellegen & Waller, in press). The ACH-Investigative correlations were not indicated by findings from the RIASEC/Big Five meta-analyses (Larson et al., 2002; Barrick et al., 2003) nor from Waller et al.'s (1995) reported correlation between ACH and their Scientist scale (.03); consequently, these correlations comprise an intriguing area worthy of further investigation.

Social Closeness (SC) and Realistic interests. For the college sample only, SC and the Realistic GOT shared a meaningful negative correlation (-.26) in the present study. As mentioned above, individuals characterized by SC are described as being sociable, liking people, and tending to turn to others for comfort (Tellegen & Waller, in press). Given that vocational theorists have described interest in Realistic activities as a preference for working with objects more than with people (Harmon et al., 1994), Larson and Borgen (2002) hypothesized that high interest in Mechanical Activities (a BIS in the Realistic domain) would be inversely associated with SC in their gifted adolescent sample; their results, however, did not yield a meaningful correlation between these two scales (-.15). Similarly, the inverse correlations between SC and the Mechanical Activities BIS (-.16) and between SC and the Realistic GOT (-.13) were not meaningful in the total sample of the present study, and correlations between SC and the other Realistic BISs were .01 with Agriculture, .01 with Nature, -.09 with Military Activities, and .21 with Athletics.

Waller et al. (1995) found a meaningful negative correlation between SC and Realistic-type interests in Blue Collar occupations (-.25), described as skilled trades in appliance repair, auto mechanics, carpentry, electricity, and plumbing. Similar to the present findings, they did not, however, report meaningful negative correlations between SC and their other Realistic-type scales—Farmer (-.17), Military (-.12), and Athletics (.04). Thus, the more meaningful negative correlations

between SC and the Realistic GOT for college students (-.26) in the present study and between SC and Blue Collar interests in Waller et al.'s (1995) adult sample (-.25), indicate that, while the hypothesized tendency for relatively lower SC in individuals with Realistic interests does not hold true broadly, it is an idea that warrants further investigation and clarification in future studies.

Constraint (CT) and Interests

Harm Avoidance (HA) and Realistic interests. The most substantial and robust I-P correlations involving CT and CT-affiliated primary factors (i.e., Control, Harm Avoidance, and Traditionalism) were the negative correlations found between HA and Realistic interests. Specifically, HA correlated substantially with the Realistic GOT (-.31), and meaningfully with three Realistic BISs—Agriculture (-.21), Military Activities (-.24), and Mechanical Activities (-.28). Individual studies of I-P convergence using the MPQ were the first to report meaningful negative correlations between Realistic-type interests and a harm-avoidant personality style (e.g., Waller et al., 1995; Larson and Borgen, 2002), whereas meta-analyses of RIASEC/FFM studies (i.e., Barrick et al., 2003; Larson et al., 2002) reported no meaningful correlations between Realistic interests and personality scales. Thus, the confirmation by the present meta-analyses that, for both females and males, a risk-taking personality type tends to be affiliated with career interests that involve action and concrete problem-solving (e.g., activities of building, repairing, and working outdoors) rather than ambiguity and abstract problem-solving (Harmon et al., 1994), is an exciting advancement for this body of research. It is notable, however, that while the correlation between HA and Waller et al.'s Blue Collar scale was meaningful (-.25), correlations with their other Realistic-type scales—Farmer (-.03) and Military (-.11)—were not as meaningful as the comparable correlations between HA and Agriculture (-.21) and HA and Military Activities (-.24) were in the present analyses.

Harm Avoidance (HA) and the Science BIS. In addition to the inverse correlations between HA and Realistic interests, the present study also identified a meaningful (though less substantial) correlation between HA and the Science BIS (-.20). The Science BIS is contained within the Investigative domain of the SII, and is adjacent to the Realistic domain in Holland's hexagon; thus, the correlation between Science and HA is further indication that common underlying variance may be shared by the HA, Investigative, and Realistic dimensions. Consistent with these results, Waller et al.'s (1995) findings indicated meaningful inverse correlations between Harm Avoidance and both Realistic and Investigative-type interests. Namely, Waller et al. reported a -.25 correlation between HA and the Blue Collar scale (i.e., skilled trades such as appliance repair, auto mechanics, carpentry, electrician, plumber), and they reported an even stronger-.38 correlation between HA and an

Investigative-type interest scale, Explorer-Scientist (i.e., physical sciences such as astronomy, chemistry, geology, and physics).

Taking into account the findings for Realistic-types scales discussed above, it seems HA may be inversely affiliated with a common factor underlying both the Realistic and Investigative domains—but that this factor may primarily represent an affinity for mechanical and physical sciences more than for agriculture, nature, professional athletics, or medical and mathematical sciences. Assessment of this affiliation in future studies could serve to clarify the nature of the variance shared by these particular interest and personality domains. Furthermore, the differences between the present study and Waller et al.'s correlations suggest that further investigation into the possible influence of SES and status goals could be informative.

Traditionalism (TRA) and the Religious Activities BIS. The Constraint-affiliated primary factor of TRA correlated meaningfully with the Social GOT (.22), but this correlation appears to reflect the more substantial correlation between TRA and the Social-affiliated BIS, Religious Activities (.37). (The correlations between TRA and the other three Social BISs ranged from .09 to .11). Waller et al. (1995) similarly reported a .26 correlation between TRA and their Religion scale. In the Waller et al. study, TRA was also meaningfully correlated with the Explorer-Scientist scale (-.27). However, no meaningful correlations between TRA and the Investigative GOT or any of the three Investigative BISs were identified in the present study (*rs* ranging from -.02 to .08). Traditionalism was not considered a marker for any of the Big Five factors by Blake and Sackett (1999), and correlations with TRA do not seem directly comparable with any of the RIASEC/Big Five correlations reported in meta-analyses by Larson et al. (2002) and Barrick et al. (2003). Thus, the relation between interests in religious activities and a personality style preference for a conservative social environment and high moral standards is a unique contribution of the MPQ.

Moderators of TRA-interest correlations. Correlations between TRA and interest scales accounted for two of the seven correlations identified in the present study as noteworthy for the influence of age or sex as moderating variables. First, the Agriculture BIS had a significantly stronger positive correlation with TRA among males than females. For males, the correlation between Agriculture and TRA was modestly meaningful (.20), but was negligible for females (.05).

The second moderated correlation involving TRA reflected age group differences in the correlation between TRA and the Artistic GOT. For the adult career clients surveyed, a meaningful negative correlation (-.23) was observed between TRA and the Artistic GOT. The correlations for the gifted adolescent sample (-.04) and the college student sample (-.11), however, were not meaningful. Similarly, age was found to influence significantly the correlation between the Artistic GOT and the

higher-order scale, Constraint (CT). Whereas a meaningful negative correlation was found between CT (i.e., cautiousness, conventionality, traditionalism) and the Artistic GOT for the adult career clients (-.24), this correlation was not meaningful for the college students (-.11) or the gifted adolescents (-.05). High scorers in the Artistic GOT are described as those who create and/or enjoy art, drama, music, or writing. These individuals value aesthetic qualities, have a great need for self-expression, and are often quite comfortable in academic or intellectual environments due to a typical verbal-linguistic bent (Harmon, et al., 1994).

In the non-student, non-client, middle-aged sample of participants assessed by Waller et al. (1995), a meaningful -.27 correlation occurred between the TRA and the Writer scale, which is similar in nature to the correlation between TRA and the Artistic GOT for the adult career clients in the present study. However, Waller et al.'s other Artistic-type scales, Performing Arts and Arts and Crafts, did not correlate meaningfully with TRA (-.15, -.05, respectively), which may reflect a less intellectual nature of these interest scales. Given the differences in these correlations and samples, the stronger correlations found between Artistic interests and a traditional, constrained personality type for the adults could reflect generational or educational differences—or a combination of both. These differences are worthy of examination in future studies, and evaluation of the influence of age, sex, and education level on correlations between Artistic BISs (in addition to the GOT) and constrained, traditional personality traits would contribute to a better understanding of these findings.

Lack of support for Conscientiousness-Conventional convergence. The idea that a meaningful correlation exists between a conscientious, controlled personality style and career interests in conventional-type activities has been suggested in the literature on interest-personality convergence (e.g., Ackerman & Heggestad, 1997; Larson et al., 2002), but support for the strength and meaningfulness of this relation has varied across studies. From the Big Five/RIASEC meta-analyses, Larson et al. reported a meaningful correlation between Conscientiousness and the Conventional GOT (.25), but the same correlation reported by Barrick et al. (2003) was modest (.19). Larson et al. (2002) reported that two moderating variables affected this correlation in their study. First, they reported a significant difference between interest measures, with the SDS yielding a substantial .29 correlation, but the SII a mere .13. Secondly, they also reported a substantial difference between men and women for this correlation (i.e., .30 for men versus .20 for women).

Blake and Sackett (1999) identified the MPQ primary factor, Control (affiliated with the CT higher-order factor), as the scale most similar to the FFM Conscientiousness construct. As a personality descriptor, Control (CTL) refers to the tendency to plan ahead and be reflective, cautious, careful, and rational (Tellegen & Waller, in press). Using CTL as a marker of Conscientiousness,

Blake and Sackett reported a .22 correlation with the Conventional GOT for their sample of adult career clients. In the present study, the correlation between CTL and the Conventional GOT (using the SII) was not meaningful (.17), and the correlation values for females and males were similar (.16 F, .18 M). In addition, correlations between CTL and the three Conventional BISs (*r*s ranging from -.05 to .16) were not meaningful, either. Similarly, Waller et al. (1995) did not report a meaningful correlation (.16) between CTL and their Numbers scale—a non-SII scale that seems to fit best with the Conventional theme of the RIASEC model.

Although the primary factor of Control (CTL) was suggested by Blake and Sackett (1999) as the best marker for Conscientiousness of the FFM, the MPQ higher-order factor, Constraint (CT), is also similar to the Conscientiousness construct. In the present study, Constraint correlated more strongly than Control with the Conventional GOT (.19). The correlation between CT and the Conventional GOT in the present study was generally consistent with the moderate Big Five meta-analytic correlations reported between Conscientiousness and the Conventional GOT by Barrick et al. (2003; $r = .19$) and by Larson et al. (2002; $r = .25$). Although Larson et al. (2002) recorded meaningful sex differences for this correlation, significant systematic differences attributable to moderators of age or sex did not occur in the similar correlation between CT and the Conventional GOT in the present study.

Furthermore, the correlation between CT and the Conventional GOT in the present study appeared primarily to reflect the correlation between CT and interests in Office Services (.20), as neither of the other two Conventional BISs—Data Management (.01) and Computer Activities (-.07)—shared a meaningful positive correlation with CT. Likewise, none of the CT-affiliated primary factors (i.e., Control, Harm Avoidance, and Traditionalism) correlated meaningfully with the Conventional GOT or any of the three Conventional BISs.

Hence, findings of the present meta-analyses, as well as Waller et al.'s (1995) study, do not support the idea that individuals with a conscientious, controlled personality style are generally more likely to hold Conventional career interests. Although Larson et al. (2002) reported a meaningful correlation between Conscientiousness and the Conventional GOT (.25), they found that the SDS yielded significantly stronger correlations than the SII, which they hypothesized was due to an additional section of the SDS in which participants assess their abilities organized by interest type. The present findings support Larson et al.'s idea that the SDS, compared with other interest measures, may have yielded an inflated correlation between these constructs.

Negative Affectivity (NA) and Interests

For the final of the MPQ Big Three domains, NA, only five correlations with interest scales were meaningful for the total sample, and all five were correlations between interest scales and the MPQ primary factor, Aggression (AGG). No meaningful correlations occurred between interest scales and the higher-order factor, NA, or with the affiliated primary factors of Alienation (ALI) and Stress Reaction (SR). Stress Reaction is defined by Tellegen and Waller (in press) as the tendency for feeling nervous, vulnerable, sensitive, and prone to worry. Blake and Sackett (1999) identified SR as the best MPQ marker for Neuroticism of the FFM. The lack of meaningful correlations between SR and interest scales in the present study were, therefore, consistent with findings of RIASEC/FFM meta-analyses by Larson et al. (2002) and Barrick et al. (2003), who likewise reported no meaningful correlations between Neuroticism and interest scales. The meaningful inverse correlations found between Aggression and Social interests in the present study are, subsequently, noteworthy given the lack of meaningful correlations between interests and personality traits involving negative affect in the RIASEC/FFM meta-analyses.

Aggression (AGG) and Social interests. Aggression is defined as the tendency to hurt or frighten others for one's own advantage (Tellegen & Waller, in press). In the present study, AGG correlated inversely with the Social GOT (-.22) and three of the four Social BISs—Teaching (-.22), Social Service (-.23), and Religious Activities (-.24). Thus, there appears to be a common dimension underlying the Aggression personality construct and the domain of social interests—that is, interests in occupations that involve helping, instructing, caregiving, working in groups, discussing feelings, and being the center of attention (Harmon et al., 1994). These results are consistent with the -.25 correlation reported by Waller et al. (1995) between AGG and their Religion scale, as well as with the -.29 correlation reported between AGG and their Personal Service scale (e.g., barber, masseur, cosmetician). The exception to the strong inverse correlations between AGG and Social interests in the present study is the Medical Service BIS, which correlated -.06 with AGG.

Sex difference for Alienation (ALI) with the Culinary Arts BIS. One of the five noteworthy sex differences in this study involved the CT-affiliated primary factor, ALI. High scorers on ALI are described as having a tendency toward feeling mistreated, victimized, betrayed, and the target of false rumors (Tellegen & Waller, in press). Representing the widest sex difference of I-P correlations in the present study, the Culinary Arts BIS shared a meaningful, though modest, inverse correlation with ALI for females (-.21), compared with a positive correlation for males (.14).

Given that culinary interests have traditionally tended to be more affiliated with female gender roles than male gender roles, the sex difference in the ALI-Culinary correlation may reflect a

connection between traditional gender roles and feelings of positive adjustment versus non-traditional gender roles and feelings of alienation. It should be noted, however, that because Culinary Arts is a BIS new to the 1994 SII, its correlation with ALI reflects only college students from the Staggs et al. (2003) and Larson (2003) samples. Thus, the sex difference may not generalize to other demographic groups. The scale most similar to Culinary Arts in Waller et al.'s (1995) study is Food Service—described as careers catering or managing a cafeteria, restaurant, or bakery. Though similar, this scale may reflect more of a business than artistic bent in comparison with the SII Culinary Arts BIS. The correlation between Food Service and ALI in Waller et al.'s adult sample was not meaningful (.06).

In sum, the personality construct of Negative Affectivity appears to share little meaningful overlap with interest scales, with the exception of modest inverse correlations between Aggression and several Social interest scales for the total sample, and a modest inverse correlation between Alienation and Culinary Arts for female college students.

Absorption (ABS) and Interests

Convergence with Artistic interests. Although ABS is an MPQ primary factor, it is discussed independently throughout this report due to its equal affiliation with the higher-order factors of Negative Affectivity (NA) and Positive Affectivity (PA). Absorption—defined as responsiveness to evocative sights and sounds and the tendency to be readily captured by entrancing stimuli (Tellegen & Waller, in press)—yielded seven meaningful correlations with interest scales, and its connection with Artistic scales was the most substantial cluster of correlations in the correlation matrix. Absorption correlated above .30 with the Artistic GOT and all the Artistic BISs except Culinary Arts (i.e., Music/Dramatics, Art, Applied Arts, and Writing).

The correlations reported by Waller et al. (1995) between ABS and three Artistic-type interest scales—Performing Arts, Arts & Crafts, and Writer—were somewhat discrepant from findings of the present study. Waller et al. reported a .22 correlation between Performing Arts and ABS, a .16 correlation between Arts & Crafts and ABS, and a .16 correlation between Writer and ABS. The Performing Arts scale by Waller et al. (i.e., actor, singer, dancer) is quite similar to the Music/Dramatics scale of the SII. Whereas the correlation between ABS and the Music/Dramatics BIS was substantial (.40) and one of the strongest in the present study, the correlation between ABS and Performing Arts in Waller et al.'s study was modest (.22) and weaker than 16 more substantial interest-personality correlations in their study. Waller et al.'s Writer scale (i.e., novelist, scriptwriter, playwright) also appears quite similar to the Writing BIS of the SII, but the .16 correlation found by Waller et al. is substantially weaker than the comparable .35 correlation found in the present study. Finally, Waller et al.'s Arts & Crafts scale refers to making hand-worked items such as pottery,

embroidery, jewelry, and carvings. Given the active, hands-on nature of this scale, and the lack of a more intellectual component, it may have less in common with Holland's Artistic domain, and instead may be somewhat similar to the Realistic domain. Thus, this weaker correlation with ABS does not seem as surprising.

Differentiation between ABS and Openness to Experience. Absorption is the MPQ scale identified by Blake and Sackett (1999) as the best marker for the Openness to Experience construct of the FFM. The substantial overlap between ABS and Artistic scales in the present study is consistent with the convergence between Openness to Experience and the Artistic GOT reported by Larson et al. (2002) and Barrick et al. (2003) in the RIASEC/Big Five meta-analyses (.48, .39, respectively). Larson et al. and Barrick et al. also reported meaningful correlations between Openness and the Investigative GOT (.28, .25, respectively). In the present study, however, ABS did not correlate meaningfully with the Investigative GOT or any of the three Investigative BISs (r s ranging from -.05 to +.15). (Instead, the MPQ primary scale, Achievement, was the personality scale that correlated most meaningfully with Investigative interests.) These findings provide another excellent example of the increased clarity of interest-personality convergence that has been achieved with the use of primary scales of the MPQ model.

Other BIS Correlates. In addition to its correlation with Artistic scales, ABS correlated positively with the Nature BIS (.26; R theme) and the Social Service BIS (.20; S theme). Comparable correlations were not reported by Waller et al., 1995. Comparison with the ways Artistic, Nature, and Social Service interest scales correlate with other personality factors of the MPQ in the present study (see Table 3.10) suggests that ABS shares more common variance with PA than NA.

Sex differences. Finally, two meaningful sex differences were found in the way ABS correlated with interest scales. Specifically, ABS correlated meaningfully with the Realistic GOT (.24) and the Mechanical Activities BIS (.21; R Theme) for females, but these correlations were negligible for males (.08, .05, respectively). These correlations for females are somewhat surprising, and correlations of this type have not, to the author's knowledge, been suggested by any previous studies in this area of research.

Summary of Meaningful I-P Intersection

Whereas Larson et al. (2002) and Barrick et al. (2003) reported a total of three I-P correlations that were .30 or greater (i.e., Openness with Artistic, Extraversion with Enterprising, and Extraversion with Social), the present meta-analyses identified 13 such correlations. The most substantial areas of convergence occurred between Social Potency (SP) and Enterprising interests and between Absorption (ABS) and Artistic interests. In addition, Traditionalism (TRA) correlated

substantially with Religious Activities (a Social BIS), and Harm Avoidance (HA) shared a substantial inverse correlation with the Realistic GOT.

At the higher-order level of personality scales, Positive Affectivity (PA) correlated substantially with the Public Speaking BIS. The correlation between Public Speaking and the more specific MPQ scale, Social Potency, was even stronger. Finally, PA also correlated substantially with the Social GOT, indicating that a general shared dimension underlies these two broad domains. In addition to the 13 substantial correlations that met the criterion of .30 for substantial clinical meaningfulness, an additional 40 correlations were .20 or greater, with 11 of these between .25 and .29. Thus, the total number of noteworthy correlations clearly exceeds the number found by studies reporting only pervasive relations between higher-order FFM and SII dimensions.

Summary of I-P Distinctiveness

Several SII and MPQ scales were notable for sharing no meaningful convergence across the interest and personality domains in the combined sample. Among the MPQ scales, no correlations with interest scales reached .20 for Alienation (ALI), Stress Reaction (SR), Negative Affectivity (NA), or Control (CTL). The first two scales, ALI and SR, are primary scales affiliated with the third scale listed—the higher order dimension of NA; and CTL is a primary scale affiliated with the higher-order factor, Constraint (CT). For SII scales, no correlations with personality scales reached .20 for the Conventional GOT or two of the three Conventional BISs—Data Management and Computer Activities.

In addition, the two BISs involving medical interests did not correlate meaningfully with any personality scales. The Medical Science BIS is categorized within the Investigative domain, and Medical Service BIS is categorized within the Social domain. The lack of meaningful correlations with the medical and conventional scales suggests that individuals with interests in these areas vary widely in personality styles. Another possible explanation, however, is that there is less consensus in people's perceptions about the personality traits these occupations require (Waller et al., 1995). Further investigation of the possible reasons for lack of meaningful convergence between these constructs constitutes a worthwhile area of future study.

Influence of Moderators, Genetics, and Societal Gender Roles

As revealed in the above description of findings, neither sex nor age had a substantial effect overall on correlations across interest and personality domains, but several specific correlations reflected statistically significant differences ($p < .01$) that revealed a meaningful correlation (i.e., $r \geq .20$) for one of the demographic groups which was not meaningful for the total sample.

Summary of sex differences. In sum, sex had a significant influence on three relations in the Realistic domain—with the Realistic GOT and the Mechanical Activities BIS strongly associated with Absorption (ABS) in females, whereas this was not the case for males. For males, the Agricultural BIS was positively affiliated with Traditionalism (TRA), which was not the case for females. For females, Achievement (ACH) correlated uniquely with the Law/Politics BIS. And finally, Culinary Arts interests correlated inversely with Alienation (ALI) for females, whereas the correlation for males was positive (though not meaningful). Although these sex differences warrant discussion, it should be noted that none of these differences reflect interest-personality overlap that exceeds 6% for either sex group; thus, substantial clinical meaningfulness is not indicated. The relative lack of sex differences found in the present study is consistent with conclusions by Larson et al. (2002) and Barrick et al. (2003) in their FFM/RIASEC meta-analyses.

Genetic implications. Of particular interest is the consistency between the personality traits involved in the present study's meaningful sex differences and the specific MPQ scales reported by Finkel and McGue (1997) as noteworthy for variance from the other MPQ scales in terms of heritability. Finkel and McGue concluded that the same genetic loci appear to influence personality for both males and females, and that the amount of variance attributable to heritability is about the same across traits (i.e., 40% to 50%) when comparing traits for men and women combined. However, they reported that genetics appear to play a greater role for men than women in determining Alienation (ALI) and Control (CTL), and that genetics appear to play a greater role for women than men in determining Absorption (ABS). In other words, they reported that the environment appears to have a different level of influence on these factors depending on one's sex, and culture appears to place different expectations on men than women in these areas of personality. Considering Finkel and McGue's findings, it is noteworthy that ABS and ALI, two of the four MPQ traits involved in meaningful sex differences in the present study, are also two of the three MPQ traits identified by Finkel and McGue as being differentially influenced by the environment for women and men.

Implications for gender roles. Several of the correlations noted above for being moderated by sex are also particularly noteworthy because they involve interest areas that have historically been predominantly men's careers—the Realistic GOT, the Mechanical Activities BIS, the Agriculture BIS, and the Law/Politics BIS. It is not surprising that, for females, the Law/Politics BIS correlated meaningfully with Achievement (ACH)—the tendency to work hard and enjoy tackling demanding projects. These two scales were *not* strongly correlated for males. This sex difference may reflect an understanding by women and girls that, in American society, the commitment to hard work is more essential for women who want to succeed in law and political careers that have typically belonged to

men—where barriers to women’s advancement and fewer female role models exist. The meaningful correlations among females of ABS with the Realistic GOT and the Mechanical Activities BIS offer a novel and unexpected area of interest-personality intersection that is worthy of further examination.

Age as a moderator. Of the 84 correlations between the 11 MPQ primary scales and the six GOTs of the SII, only three correlations among the three age groups included in the study (i.e., gifted adolescents, college students, and adult career clients) reflected differences that were both statistically significant ($p < .01$) and also revealed a meaningful correlation ($r \geq .20$) for one age group that was not already indicated as such for the total sample. These three correlations were the Realistic GOT with Social Closeness (SC) for the college student sample, the Artistic GOT with Traditionalism (TRA) for the adult career client sample, and the Artistic GOT with Constraint (CT) for the adult career client sample ($-.24$). Although they are worth noting, none of these three effects are considered clinically substantial using the $r \geq .30$ criteria, but reflected shared variance between 5% and 7%.

Although Goh and Leong (1993) and Barrick et al. (2003) hypothesized that interest-personality correlations might be lower for student samples than adult samples due to students having less differentiation in their personalities and interests than working adults, this age variable did not appear to have a significant impact on findings of the present study. In their results, Barrick et al. reported that relations were “somewhat stronger” (mean increase of $.07$) for working samples than student samples, with particularly large increases for the Enterprising GOT with FFM traits and for Openness to Experience with RIASEC GOTs.

Given these findings and the instinctive expectation that younger individuals might have less sophisticated identity development than older individuals, useful future research pursuits might involve further examination of age trends in personality and interest differentiation, and further analyses of age as a moderator of interest-personality correlations. In the present study, sex differences were analyzed only for correlations between MPQ scales and the six GOTs of the SII. In addition, the age variable may have been confounded with variables of intelligence, educational level, and SES. Thus, future studies could advance knowledge in this area by examining effects of age with a single random sample, and by including correlations with the lower-order BISs in addition to the higher-order GOTs.

Occupational status and alternative interest scales. Waller et al.’s findings for I-P correlations with non-SII interest scales seemed generally concurrent with most of the meaningful correlations found in the present study—namely, Social Potency (SP) with Enterprising interests, Harm Avoidance (HA) with certain Realistic interests and Science (inversely), Social Closeness (SC) with Social interests, Traditionalism (TRA) with Religion, and Aggression (AGG) with Social

interests (inversely). Both studies also agreed on a lack of intersection between Control (CTL) and Conventional interests, and a general lack of meaningful correlations involving Stress (SR) Reaction and Alienation (ALI).

Several meaningful differences between the two studies are, however, noteworthy. In comparison with the substantial correlations between Absorption (ABS) and Artistic interests in the present study, the correlations between ABS and Artistic-type scales in Waller et al.'s (1995) study were only modest. Waller et al. also did not report correlations comparable to the meaningful intersection found in the present study between Achievement (ACH) and Investigative interests, or between HA and Agriculture and Military interests (R Theme). On the other hand, Waller et al. found meaningful inverse correlations between the following scales: SP and Personal Service (most similar to the Social domain); TRA and Scientist-Explorer (similar to Investigative); TRA and Writer (Artistic); and, SC and Blue Collar (Realistic). While correlations comparable to these were not found in the present study for the combined sample, the latter two findings are noteworthy for being relevant to two significant age group differences reported. First, the inverse correlation between SC and the Realistic GOT was meaningful for college students only (-.26), and second, the inverse correlation between the TRA and the Artistic GOT was meaningful for the adult career clients only (-.23).

In Waller et al.'s (1995) study, interest scales were not constructed according to the RIASEC model, and a larger percentage of the interest items (~40%) referred to jobs that do not require post-secondary education. Their study also differed in that participants were instructed to pretend that all jobs yield equal status and pay. Given these differences, the concurrence of SP and HA as substantial correlates with interests is striking, and so are the convergent implications for meaningful correlations involving SC, AGG, and TRA. Whereas the common variance shared by AGS and Artistic interests was one of the most substantial in the present study, the weaker correlations in Waller et al. may reflect basic construct differences in the Artistic-type scales of the two studies.

The differences noted above constitute interesting areas in which the possible influence of status needs, pay expectations, and education level on I-P correlations, and on interest assessment in general, could be evaluated in future studies. Comparison with Waller et al.'s (1995) study also highlights the usefulness of using a variety of instruments and models to measure interests (as well as personality), as well as the usefulness of assessing leisure interests as a way to avoid possible confounds of non-interest factors (e.g., status and pay expectations, knowledge of a career) in individuals' responses on career interest inventories.

*Implications and Limitations**Theory Development*

One aim of the present study was to integrate conclusions with proposed models and theories regarding the nature of shared dimensions underlying personality and interests, and with hypotheses about the causal order of development and expression of both domains. While correlation data cannot determine causation, several findings provide relevant implications for future theoretical endeavors.

Swanson (1999) articulated the question of which specific interest domains seem to share the most common genetic influence with personality. Present findings suggest that these interests include those found within the Enterprising and Artistic domains primarily, followed by the Realistic and Social domains, and then the Investigative domain. Interests categorized as Conventional appear to share the least genetic influence with personality, and MPQ primary factors Alienation (ALI), Stress Reaction (SR), and Control (CTL) do not appear to stem from dimensions that also underlie interest development/expression. In addition, correlations between Harm Avoidance (HA) and Realistic (R) and Investigative (I) interests support the adjacent location of R and I on the RIASEC hexagon, and correlations between PA and Social (S) and Enterprising (E) interests support the adjacent location of S and E on the RIASEC hexagon. The consistency in these patterns suggests the possibility of the same underlying genetic factors influencing these related dimensions.

Some theorists have hypothesized that interests are a “surface” expression of more fundamental personality traits—a theory consistent with Holland’s long-held and debated belief that interests are an *expression* of personality (Costa, McCrae, & Holland, 1984; Holland, 1959, 1966, 1997, 1999). Mount et al. (2003) cite motivational research (Kuhl, 1985; 1987; Corno & Kanfer, 1993) as the basis for differentiating between interests as “surface traits” and personality as “deep traits.” According to this line of thinking, interests are most closely aligned with wishes and wants, which influence action only when transformed into an intention. These motivational researchers hypothesize that personality traits, on the other hand, are more closely aligned with intentions and actions because they trigger volitional and/or self-regulatory processes that influence allocation of time and effort directed toward goal attainment. From their perspective, personality traits regulate competing tendencies and thus account for the individual differences in performance of people with similar knowledge, skills, abilities, and interests.

Ackerman and Heggestad (1997) hypothesized that abilities, interests, and personality develop in tandem. They suggest that ability and personality may determine the probability of success in a particular task, whereas interests determine the motivation to attempt the task. Consistent with the social cognitive career theory (Lent et al., 1994), successes in a particular area would subsequently

increase interest in that area, and failures would decrease interest (Swanson & Gore, 2000). Using this conceptualization, interests, personality, and ability are understood to develop in tandem, but personality and ability would continue to shape interests over time. Heritability data on both interests and personality may further counter the idea that personality traits are generally more proximal (or “deep”) than interests.

The heritability of personality traits has long been established, and the assumption of heritability is inherent in the definition of personality traits as individual characteristics that are stable over time. The most recent estimates of personality heritability are .44 for women and .45 for men (Finkel & McGue, 1997), and these estimates are consistent with previously reported estimates of .50 (Goldsmith, 1983; Nichols, 1978) and .48 (Tellegen et al., 1988). Using longitudinal twin data, McGue et al. (1993) reported that personality traits appear stable from adolescence through the adult years due to the strong influence of genetic factors, whereas personality change that does occur appears primarily associated with environmental factors. Finkel and McGue also reported that the same genetic loci appear to influence personality in both males and females, and they found no evidence for sex differences in the way genes influence personality. In addition, they found that the amount of variance attributable to heritability is about the same across traits (i.e., 40% to 50%) when comparing traits for men and women combined. The general lack of sex differences found in the present study appears consistent with Finkel and McGue’s findings that personality traits are generally influenced equally by genetics in men and women.

The heritability of interest variables has also been established. Most recently, Waller et al. (1995) reported that approximately 50% of the variance—and two-thirds of the stable variance—of occupational and leisure time interest scales could be attributed to genetic factors. (This estimate is somewhat larger than the 36% estimate reported in the review by Betsworth et al., 1994) While the stability of interests over time has been verified (e.g., D.P. Campbell, 1966; Strong, 1931; Johansson & Campbell, 1971), Swanson and Gore (2000) also discuss studies that indicate there are considerable individual differences in interest stability, with intraindividual correlation coefficients ranging from -.31 to .98 when examined over 3- to 12-year intervals (e.g., Hansen & Stocco, 1980; Hansen & Swanson, 1983; Lubinski et al., 1995; Rohe & Krause, 1998; Swanson & Hansen, 1988).

Waller et al. (1995) concluded that although genetic factors appear to account for at least 50% of the stable variance in both the domains of personality, these genetic factors are not the same in the two domains. Waller et al. emphasized only two personality factors—Social Potency (SP) and Harm Avoidance (HA)—as important for understanding common factors underlying interest and personality domains. Similarly, only two personality domains (Extraversion and Openness) and four

interest dimensions (Enterprising, Social, Artistic, and Investigative) were indicated as sharing meaningful common variance by two recent RIASEC/FFM meta-analyses (i.e., Barrick et al., 2003; Larson et al., 2002). Results of the present study, however, suggest additional areas of meaningful shared variance. Namely, correlations between ABS and Artistic interests, SP and Enterprising interests, HA and Realistic interests (inversely), TRA and Religious interests, and PA and Social interests, all seem relevant to further investigation of the connection between interest and personality models. In addition to these more substantial correlations, moderate yet meaningful overlap (4%-8%) appeared between AGG and Social interests (inversely) and between ACH and Investigative interests. Furthermore, the lack of significant differences between the three age groups seems to reflect the strong influence of genetic factors in both interests and personality, and the subsequent stability of both interests and personality over time. Given that I-P correlations did not generally appear stronger in adult samples, these results seem more consistent with the idea that interests and personality develop in tandem than with the idea that personality are more proximal traits that shape interests (in which case, interests might be expected to become more differentiated and closely aligned with personality over time).

Of value in future studies would be the use of causal modeling, longitudinal analyses, and factor analyses to determine if the above correlations reflect affiliated personality and interest factors that are equally proximal to genetic factors, if affiliated traits represent factors that are similarly influenced by the environment, or if the personality traits are more proximal factors that have particular influence on the development of interests with which they are affiliated. In addition, future researchers could further investigate why Conventional interests and NA personality scales share less affiliation across domains than other interest and personality factors. Such investigations may inform questions about the general nature of relations between interest and personality domains. For example, the lack of meaningful correlations between personality factors and Conventional interests suggests that individuals holding Conventional interests have a wider range of personality types, or that there is less consensus among people about the personality types that would tend to function effectively in careers that involve Conventional tasks. One question worth researching is whether the Conventional interest domain is differentially affected by environmental and personality factors in comparison with the other interest domains, or if the Conventional interest domain is proximal to genetic influences that are not shared in common by personality constructs.

Finally, as highlighted by Swanson and Gore (2000), investigations into what leads to a change in vocational interests, whether or not interest stability can be predicted, and the nature of

individual differences in stability of interests beyond the end of the college years would contribute to theory and practice in this field.

Diversity

One limitation of this study is the lack of ethnic diversity in the samples. Although some of the included samples did not report ethnicity statistics, the samples were generally about 90% Caucasian and primarily represented residents of the northern-Midwestern United States. For this reason, generalizability of the results to American minorities, U.S. coastal regions, and non-U.S. residents is limited. Assessment of interest-personality convergence in primarily international and American minority samples would provide interesting data regarding whether the loci of substantial intersection vary across different cultural groups. Examination of correlations involving the personality scales noted above for appearing more strongly influenced by the environment and sex differences (i.e., Absorption, Alienation, Control, Achievement, and Traditionalism) would be particularly interesting.

While future investigation of I-P convergence in more diverse ethnic groups is warranted and important, results of the present study are considered meaningful for groups other than Caucasian Americans given that both the SII and the MPQ have been demonstrated valid for a variety of ethnic groups. For example, the MPQ was validated in an Israeli sample (Ben-Porath et al., 1995), and the SII was validated in samples of African American, American Indian, Asian, and Latino(a)/Hispanic individuals (Harmon et al., 1994). Furthermore, while the influence of several cultural variables (e.g., ethnicity, SES, level of education, sexual orientation) could not be examined systematically in the present study, the diversity in age, education level, and range of majors and career interests represented is a strength of this study. Even though specific statistics were not available, the adult career client sample appeared to represent a wider range of educational achievement, and quite possibly of IQ and SES, than what is typically found in commonly used samples of college students.

Although the analyses of age as a possible moderator of I-P correlations comprised a strength and contribution of this study, a limitation of the age analyses was possible confounding by variables that may have differed systematically among the individual samples compared (e.g., intelligence, educational level, SES). For this reason, further examination of the influence of such variables is warranted for the significant differences noted among the samples of gifted adolescents, college students, and adult career clients in the present study. And, evaluation of age as a moderator within a single random sample would provide a valuable comparison with present findings. In addition, age comparisons in this study were conducted only for correlations between MPQ scales and the six GOTs of the SII. Because some meaningful age differences were found with the GOTs, future studies

could extend these preliminary findings by examining correlations with the lower-order BISs in addition to the higher-order GOTs.

Counseling

In counseling that involves career guidance, personality testing is common, and knowledge of a client's personality style and identity development is useful in a variety of ways. In addition to correlating with career interests and job satisfaction, personality data informs what methods of career guidance the client might most enjoy and be most successful using (e.g., self-paced computer research, interviews with individuals in different career fields, group workshops, individual counseling sessions, etc.). Personality data may also inform the counselor of the clients' typical decision-making process, areas in which they may encounter roadblocks in their pursuit of identity development and career information, and strengths and weaknesses that may impact their academic performance and job search efforts.

Furthermore, Waller et al. (1995) point out that the career interests individuals report may sometimes be influenced by inaccurate stereotypes of certain careers. For example, low personality correlates with the Medical Service and Medical Science BISs could reflect differences among respondents in how important they believe the prestigious, scientific, service, or achievement features are for these occupations. Due to inaccurate or undifferentiated perceptions of self or a career, clients may hold career plans that are unlikely to result in job success and satisfaction. In instances such as this, a counselor's assessment of a client's personality style, and knowledge of career interests that tend to be (or not be) good fits with that personality style, would be particularly beneficial.

Due to restrictions of time and resources, however, formal personality assessment is not always possible in career counseling situations. In these situations, the interview can provide valuable information about the client's personality. Results of the present study indicate that certain personality traits seem particularly relevant to individuals' career interests, and that knowledge of these personality variables could enhance the counselor's effectiveness with clients. Among MPQ primary factors, the present study identified Absorption (ABS), Harm Avoidance (HA), and Social Potency (SP) as the personality factors that would be most informative in terms of better understanding a client's career interests.

Consider, for example, a sophomore college student who enters counseling and tells her counselor that she is considering changing her major from PreMed to PoliSci. She reports that, although she thought she wanted to pursue a career as a pediatrician, she is not enjoying nor doing well in her biology classes, and believes she would like to pursue a career as a lawyer instead. However, she must decide by the following day if she is going to switch in order to meet the deadline

for course registration. She reports that she feels confident about her plans to switch, but was strongly encouraged by her mother to visit with a counselor before finalizing her decision.

While talking with this student, the counselor asks her what she enjoyed most about high school, what organizations she has been involved in high school and college, and if she has held any positions of leadership. The student reports that she has been a student class officer every year since the 8th grade, was the student body president her senior year in high school, and the previous year was involved in campaigning with the Young Democrats organization on campus. Based on the client's interaction with the counselor and her reported leadership experience, the counselor determines that this client is forceful and decisive, fond of influencing others, and fond of leadership roles. Thus, this client would be expected to score highly on the MPQ Social Potency (SP) scale. The correlation between SP and the Law/Politics BIS in the present study was .41, indicating about 16% shared variance between these two constructs. Given knowledge of the relatively high degree of overlap between these two scales (compared with the .09 correlation between Law/Politics and Social Closeness, for example), the counselor could feel more comfortable encouraging the client to follow her desire to pursue pre-law courses. The counselor would also want to bear in mind, however, that 84% of the variance in Social Potency and Law/Politics is attributable to factors *not* shared in common between by these two constructs, and thus this correlation does not indicate a guarantee of person-environment fit.

To illustrate further, a client's SII profile may indicate that the client's strongest interests are in Realistic activities, and this client may also appear to have a personality style that is generally Harm Avoidant (i.e., preferring safe and predictable activities even if they are tedious rather than enjoying excitement and danger). Even though the present study indicated a substantial inverse correlation between HA and the Realistic GOT (-.31) and a meaningful inverse correlation between HA and the Mechanical Activities BIS (-.28), these findings of 8%-9% shared variance do not mean that this client cannot be happy and successful in a Realistic-type career—particularly one which corresponds more strongly with the Nature, Athletics, or Agriculture BISs. However, it would be advisable for the counselor to encourage the client to learn about and consider any risky and adventurous aspects of careers he or she may be considering. In general, data such as that provided by the present study should be balanced with recognition that individuals with a wide range of personalities function effectively in the same occupation, and a personality style that is divergent from that of most others in an occupation may provide an individual with opportunities for leadership or the creation of a valuable niche within that career.

Conclusion

In sum, the present study contributes to the body of interest-personality research via meta-analyses of recent MPQ/SII studies and synthesis of these meta-analytic findings with results from FFM/RIASEC meta-analyses (Barrick et al., 2003; Larson et al., 2002), as well as with Waller et al.'s (1995) large study using the MPQ and an alternative interest measure. By synthesizing studies that administered the MPQ as an alternative to measures of the Big Five, and by including correlations between specific scales of both the SII and MPQ, a number of substantial I-P correlations were discovered that had not been previously identified by the FFM/RIASEC meta-analyses, and several higher-order correlations reported by the FFM/RIASEC meta-analyses were clarified and differentiated.

Also noteworthy was the demographic diversity (i.e., gifted adolescents, college students, adult career clients) represented by the individual samples examined in this study. In addition to integrating and summarizing findings across these samples, both sex and age were statistically examined as possible moderating variables of interest-personality correlations. Neither sex nor age was found to be a substantial moderator of interest-personality correlations, and of the eight differences determined to be significantly moderated by age or sex, none of these involved a correlation that was substantial (.30 or greater) for one group while not also indicated as meaningful (.20 or greater) for the comparison group(s).

The most substantial correlations found in the present study ranged from .30 to .49—reflecting between 9% and 24% shared variance. The most meaningful of these correlations for theory and application appear to be those between Social Potency (SP) and Enterprising interests, Absorption (ABS) and Artistic interests, Harm Avoidance (HA) and the Realistic GOT, and Positive Affectivity (PA) with the Social GOT (.31). The substantial inverse correlation between HA and the Realistic GOT is particularly noteworthy given that previous Big 5/Big 6 meta-analyses had not reported any meaningful correlations between the Realistic GOT and personality factors.

The MPQ factors of Negative Affectivity (NA), Alienation (ALI), Stress Reaction (SR), and Control (CTL) were notable for not correlating meaningfully with any interests in the combined sample. Among the SII scales, the Conventional GOT, Data Management BIS, Computer Activities BIS, Medical Science BIS, and Medical Service BIS did not correlate meaningfully with any personality factors.

In aggregate, the present findings and discussion of these findings contribute meaningful information for the continued advancement of theory development and counseling application in this area of research. Future studies could contribute by further assessing the areas of discrepancy noted

between the present results and Waller et al.'s (1995) conclusions, and by evaluating the influence of other possibly moderating factors such as SES, education level, and expectations of status and pay in career interest assessment. Evaluation of I-P convergence is also recommended in more ethnically diverse samples, as are analyses that would further explain why certain interests and personality traits do not seem to correlate with any constructs in the other domain. Finally, future research studies could use the present correlation data to inform designs and models aimed at answering intriguing questions that remain regarding the development of interests and personality, the proximity of these constructs to genetic factors, and Holland's long-held belief that interests are, in fact, expressions of personality traits.

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