THE FIVE-FACTOR MODEL AND CAREER SELF-EFFICACY:
GENERAL AND DOMAIN-SPECIFIC RELATIONSHIPS

A Dissertation

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By

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ABSTRACT

Researchers have begun to investigate connections between the Five-Factor Model of personality and Social Cognitive Career Theory, but the data are limited and therefore inconclusive. To replicate and extend previous work, this dissertation explores empirical relationships between the Big Five personality factors (the NEO Five-Factor Inventory) and 24 distinct domains of career-related self-efficacy (the Expanded Skills Confidence Inventory and the Career Decision Self-Efficacy-Short Form). Findings suggest that Conscientiousness and Extraversion correlate positively with a broad range of self-efficacy domains, while Neuroticism displays a significant negative relationship with nearly all forms of career self-efficacy. In addition, Openness to Experience correlates with self-efficacy for creative and intellectual pursuits, while Agreeableness shows no significant relationship with career self-efficacy variables. Findings are evaluated in light of recent empirical and theoretical developments relating to the integration of trait and social-cognitive perspectives.
Dedicated to Michele G. Alexander
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CHAPTER 1

INTRODUCTION

1.1 Background

Contemporary vocational psychology is dominated by two very different models of personality, the trait and social-cognitive perspectives (Swanson & Gore, 2000). The trait approach emphasizes a small number of global personality dimensions that are substantially heritable and stable across time and context (McCrae & Costa, 1999). These “Big Five” personality factors, as they have been labeled (Goldberg, 1990), have been found to predict a diverse array of behaviors, from dating and alcohol consumption to college GPA and the political success of U.S. Presidents (Paunonen, 2003; Rubenzer, Faschingbauer, & Ones, 2000). By contrast, the social-cognitive perspective focuses on people’s specific beliefs—cognitions that can change over time and often vary considerably across context (Bandura, 2001). Despite their dynamic variability, these context-specific belief structures are often the best predictors of people’s behavior in the domain in question at any given time (Bandura, 1997, 1999).

Unique advances coming from each perspective have stimulated increased research productivity in both personality and vocational psychology (Funder, 2001; Swanson & Gore, 2000). The social-cognitive concept of self-efficacy (Bandura, 1977,
1997) was quickly embraced by vocational psychologists (e.g., Betz & Hackett, 1981), who showed that domain-specific perceptions of career-related capability (e.g., mathematics self-efficacy) are heavily influenced by gender-based stereotypes and other social learning experiences. Subsequent research, culminating in an integrative Social Cognitive Career Theory (Lent, Brown, & Hackett, 1994), demonstrated that self-efficacy beliefs act as significant determinants of career interests, goals, choices, and performance (see Betz, 2001, for a review).

Even as Social Cognitive Career Theory emerged as a viable model of vocational behavior, the Five-Factor Model of personality traits was gaining broad acceptance among personality psychologists, as well as interest from some vocational researchers (Tokar, Fischer, & Subich, 1998). Starting in the early 1990s, a number of scholars presented evidence that most personality traits can be empirically mapped on to five more general personality factors (Digman, 1990; Goldberg, 1990; Costa & McCrae, 1997; cf. Mischel, 1993). While personality psychologists found empirical connections between the Big Five and virtually all aspects of human behavior, vocational psychologists were particularly impressed by the factors’ ability to predict career interests, academic and job performance, and job satisfaction (Barrick, Mount, & Judge, 2001; Judge & Ilies, 2002; Judge, Heller, & Mount, 2002).

More recently, vocational psychologists have begun to explore the interface between the Five Factors and career self-efficacy (Nauta, 2004; Rottinghaus, Lindley, Green, & Borgen, 2002; Schaub & Tokar, 2005) from the perspective of Holland’s (1997) theory. This theory purports to describe the various occupations in terms of six
different kinds of work-related activity (e.g., physical work, working with people, etc.), which can also be used to describe people’s interest and self-confidence levels for various kinds of work. Initial studies of the Big Five and Holland theme *self-efficacy* have been generally consistent with previous research on relationships between the Big Five and Holland theme *interests*. For example, the Big Five Factor of Extraversion has been found to predict not only interests but also self-efficacy for Holland’s Social and Enterprising domains, both of which emphasize interpersonal skill (Nauta, 2004). Indeed, these early analyses (Schaub & Tokar, 2005) have suggested that specific personality factors (e.g., Extraversion) tend to affect specific interest themes (e.g., Social and Enterprising) partially by way of their influence on specific efficacy variables (i.e., Social and Enterprising efficacy).

1.2 **Statement of the Problem**

Despite these helpful initial reports, we are far from a definitive understanding of the Big Five Factors’ effect on career self-efficacy. First, with only three published studies on the topic (Nauta, 2004; Rottinghaus et al., 2002; Schaub & Tokar, 2005), the extant data are simply insufficient to infer the true relationships between the two construct domains. Indeed, as of this writing, no one has published a simple correlation matrix for the most popular and widely researched measures of these two construct families: the Skills Confidence Inventory (Betz et al., 1996) and Costa and McCrae’s (1992) NEO inventory. This limited quantity and diversity of data sources can be contrasted with the literature concerning the Five Factors and Holland’s (1997) interest themes, which includes numerous samples and diverse construct measures (see Tokar et
al., 1998), the results of which have been quantitatively summarized in multiple meta-analyses (Barrick, Mount, & Gupta, 2003; Larson, Rottinghaus, & Borgen, 2002).

In addition to this basic lack of data concerning the relationship of the Big Five to career self-efficacy, researchers have often designed their studies under the assumption that these relationships would parallel the aforementioned correlations between the Big Five and career interests (e.g., Schaub & Tokar, 2005). Without exception, such relationships can be characterized as “content-correspondence” effects, because they pair one of the Big Five Factors with a specific domain of career behavior on the basis of overlapping psychological content. For example, like Extraversion’s relationship to Social and Enterprising interests, the Openness to Experience factor has been found to correlate with Holland’s (1997) Artistic interest theme, presumably because both of the latter variables are linked to divergent thinking and creativity.

Because personality and career interests display these kinds of content-correspondence relationships, researchers have understandably assumed that personality and career self-efficacy (particularly for Holland’s themes) would show a similar pattern of correlations. As noted, there has been some support for this view (e.g., Nauta, 2004; Schaub & Tokar, 2005). However, it is possible that some of the Big Five Factors also have more generalized effects on vocational efficacy. A precedent for this kind of thinking can be found in the broader literature on career development and personality, where Conscientiousness, Extraversion, and Neuroticism have consistently correlated with a wide range of career belief and performance variables across a range of
occupations and nationalities (Tokar et al., 1998; Judge & Ilies, 2002). Specifically, Conscientiousness and Extraversion tend to predict positive career-related outcomes, while Neuroticism is associated with maladaptive career behavior.

Given these seemingly pervasive effects of select Five-Factor variables on career behavior, it is reasonable to hypothesize similar generalized effects on various forms of career self-efficacy. Some findings have suggested that such general effects may occur (Nauta, 2004), but other reports have focused exclusively on content-correspondence effects without reporting general effect data (e.g., Schaub & Tokar, 2005). To provide a sufficient test of this generalized effect hypothesis, scholars must examine the relationship of the Big Five to a wide variety of career self-efficacy variables, paying attention to possible trends that transcend specific efficacy domains.

1.3 **Objectives of the Study**

The current project addresses these gaps in our knowledge of the Big Five Factors and career self-efficacy. First, this investigation replicates previous correlational studies of the Big Five and Holland (1997) theme self-efficacy. But whereas the correlation matrices reported in those earlier studies (Nauta, 2004; Rottinghaus et al., 2002) were based on the Adjective Checklist (ACL) measure of the Big Five, the present work is rooted in Costa and McCrae’s (1992) NEO Five-Factor Inventory (NEO-FFI), which is more widely used in research and counseling practice. If findings from the previous studies are reproduced with the NEO-FFI, this would heighten our confidence that we are dealing with true population relationships between the Big Five and career efficacy constructs.
Second, in addition to the six Holland (1997) theme efficacy measures, the current study examines eighteen other career self-efficacy domains. These scales represent diverse forms of efficacy that range from mathematics and use of technology to cross-cultural communication and the career decision-making process itself. By extending the range of efficacy domains beyond those tied to Holland’s themes, this study provides a clearer picture as to whether Big Five effects are primarily limited to content-correspondent efficacy domains or if, perhaps, some of the Big Five have effects on efficacy that transcend content. Whatever the case, a better understanding of the interface between trait and social-cognitive constructs should prove informative as vocational psychologists continue to search for a unifying model of career behavior.
2.1 Foundations of Personality and Vocational Psychology

The interface between personality and vocational psychology has a long history and shows no sign of diminishing (Borgen & Lindley, 2003). The two disciplines are fundamentally connected by their shared roots in psychometric theory and the study of individual differences (Dawis, 1992). There are also significant theoretical linkages, as the most prominent vocational models have explicitly conceptualized career development as an extension of personality—whether framed in terms of broad dispositions (Holland, 1959), developmental psychodynamics (Roe, 1956; Bordin, Nachmann, & Segal, 1963), or the self-concept (Super, 1953). On a particularly encouraging note, these two fields are increasingly connected not only by shared methodology or theoretical propositions, but also by empirical research. Quantitative study of personality’s effects on career development seems to be accelerating (Swanson & Gore, 2000), with recent publications examining the impact of personality on everything from career interests and goals to career maturity and vocational identity (Tokar et al., 1998; Borgen & Lindley, 2003).
Contemporary vocational psychologists’ heightened interest in personality stems in large part from a broader theoretical consolidation that has taken place in the last several years. Specifically, the trait and social-cognitive perspectives now account for the majority of research being published in both personality and vocational psychology (Funder, 2001; Swanson & Gore, 2000), while large-scale interest in humanistic and psychodynamic models has waned. To a large extent, this can be attributed to parsimony and testability. Both the trait and social-cognitive models explain personality and vocational behavior in terms of fairly intuitive, common sense concepts; and both approaches have proven amenable to standard methods of establishing construct validity (Cronbach & Meehl, 1955), such as classic experimental design and scale-driven correlational research. Meanwhile, the humanistic and psychodynamic theories of years past have succumbed to a lack of conceptual and operational precision, as their most viable constructs (e.g., attachment style, self-concept) have been assimilated into evolving trait and social-cognitive formulations (e.g., Westen, 1998; Feeney & Noller, 1996, Baumeister, 1998).

Although the trait and social-cognitive models enjoy a shared dominance over both personality and vocational psychology, calls for integration of these two theories have elicited a mixed response (Funder, 2001; Borgen & Lindley, 2003). Personality psychologists in particular are embroiled in an ongoing, often polemical debate over the relative merits of the two approaches (e.g., Shadel & Cervone, 1993; Bandura, 1999; Funder, 1991; Goldberg, 1993a, 1993b). This is not altogether surprising, given that the two models make different assumptions about the fundamental nature of human behavior,
including the level of generality at which personality is best understood, the relative roles of nature and nurture in determining personality, and the stability vs. malleability of personality over time (e.g., McCrae & Costa, 1999; Bandura, 2001). The most prominent trait theory assumes that the fundamental elements of personality are largely inherited, universal, consistent across situations, and resistant to change over time (McCrae & Costa, 1999); while social-cognitive theorists insist that personality is a learned product of culture that shows dynamic variation across situations and is substantially malleable over time (Bandura, 2001; Mischel & Shoda, 1995; Markus & Kitayama, 1998). The fact that neither model has been able to absorb or eradicate the other may speak to the creative value of these polarities—nature vs. nurture, statics vs. dynamics—in facilitating empirical inquiry.

Betraying their pragmatism, vocational psychologists have taken a much more eclectic approach to the trait vs. social-cognitive debate and have actually begun to identify points of conceptual and statistical convergence between the two theories (e.g., Betz et al., 1996; Lent, Brown, & Hackett, 2000). This relatively new integrationist research program implicitly embraces Lewin’s (1935) maxim that vocational behavior is a function of the enduring person (trait view) in dynamic, ongoing interaction with the environment (social-cognitive view). Specifically, the integrationist perspective holds that both heritable trait dispositions and ongoing life experiences exert effects on the development of specific career-related cognitive structures and interpretations, which in
turn shape vocational behavior (cf. Lent et al., 1994; cf. McCrae & Costa, 1999). Early evidence supports this argument that specific cognitive variables mediate the effects that general traits have on career behavior (e.g., Nauta, 2004).

The present study continues the integrationist trend in vocational psychology, placing one foot in the trait approach and the other in social-cognitive theory. Specifically, this project uses the domain of career behavior to demonstrate how a few global personality traits (the Big Five Factors) can affect a wide range of narrower social-cognitive variables (domain-specific self-efficacy expectations). But before delving into the nuances of the current study, these two underlying theoretical models are reviewed in greater depth.

2.2 The Person: Assumptions of the Trait Perspective

The trait approach to personality is the study of individual differences, grounded in what Mischel (1993, p. 147) describes as “the commonsense observation that individuals often differ greatly and consistently in their responses to the same psychological situation or stimulus.” Along these lines, a personality trait can be defined as a pattern of interrelated psychological tendencies that account for the cross-temporal, cross-situational consistency in one’s thoughts, feelings, and actions (cf. Funder, 1991). Also, as implied by Mischel, traits serve as dimensions of reference for comparing and contrasting individual personalities (see also Dawis, 1992).

Most trait theorists argue that the folk attributions permeating our language—shy, aggressive, and so forth—evolved as conceptual-linguistic tools for categorizing genuine psychological realities. This “fundamental lexical hypothesis” (Goldberg, 1990, p. 1216)
has a long tradition in personality psychology, one that began with Galton (1884) and a pair of German researchers (Klages, 1926; Baumgaten, 1933), and which has attracted continuing interest in the United States from Thurstone (1934), Allport and Odbert (1936), Cattell (1943), and more recently, Goldberg (1990) and his colleagues (Ashton et al., 2004). In this approach, dictionaries and thesauri are exhaustively searched for trait adjectives, which are then used by participants to rate their own or others’ personalities. Next, the data from these questionnaires are factor analyzed to identify sets of traits that empirically cluster together, suggesting underlying superordinate traits.

Although trait theorists generally agree that folk personality adjectives reflect real individual differences in behavioral tendencies, they disagree as to whether traits actually cause these patterns or merely serve as convenient labels for describing them (Pervin, 1994; McCrae & Costa, 1999). Some trait scholars adopt a constructionist view of the lexical/factor analytic trait methodology. From this perspective, trait adjectives are culturally transmitted linguistic tools that people have found useful in describing socially significant personality characteristics, but such labels are not isomorphic with the actual psychological dynamics that govern personality (e.g., Hogan, 1996; see also, Tokar et al., 1998; Mischel, 1999).

However, others (e.g., Allport, 1931, 1966; McCrae & Costa, 1999; Funder, 1991) argue that traits are not mere social constructions, but genuine neurodynamic mechanisms that give rise to (i.e., cause) the unique regularity of a person’s behavior and mental processes. Thus, when you observe that Bob is habitually irascible and aggressive, you are not only placing a label upon him: you are inferring an underlying
neuropsychological mechanism that governs, and therefore explains, the consistency of his actions. In support of this realist view, McCrae and Costa (1999; Costa et al., 1999; McCrae et al., 2005) note that traits are substantially heritable, stable over decades, structurally the same across cultures, and capable of predicting a wide variety of real-world behaviors and life outcomes. If the traits derived from the lexical-factor analytic paradigm were nothing but linguistic conventions, we would not expect them to have such pervasive empirical connections to human biology and behavior.

2.3 The Environment: Trait Psychology under Fire

While the current debate focuses on whether traits cause or simply describe behavior, there was a time when many psychologists questioned whether traits did either. In the late 1960s, while behaviorism was still wielding considerable influence on psychological discourse, Mischel (1968) released a landmark book, *Personality and Assessment*, that popularized the term “personality coefficient.” This term referred to the fundamental conclusion of Mischel’s review of the trait literature: that personality traits typically show unimpressive correlations with observed behavior and that behaviors themselves are often inconsistent across diverse situations. This seemed to reinforce, in a manner of speaking, the prevailing behaviorist view that the environment is the chief determinant of our actions. Indeed, the personality coefficient called into question the very notion of a coherent, consequential personality (Goldberg, 1993a, 1993b).

Although Mischel’s (1968) thesis received considerable attention, casting an enduring pall on the whole trait enterprise, proponents of the trait model have since marshaled ample justification for their perspective (see Funder, 2001, Mischel, 1993). To
put the personality vs. situation debate in perspective, Funder and Ozer (1983) noted that
cross-situational correlations for a given behavior are often as large as some of the more
famous experimental manipulation effects in social psychology. Epstein (1979)
demonstrated that, although the correlation between a trait (e.g., Extraversion) and
behavior measured in a single situation is small, the correlation between a trait score and
an aggregate set of relevant behaviors is substantial. Finally, from an interactionist
perspective, Funder and Colvin (1991) have reminded us that experimental manipulations
yielding significant behavior change are not incompatible with personality traits that
demonstrate consistency—a point underscored by numerous studies that reveal both
experimental main effects and personality interaction effects (i.e., traits that act as
moderator variables).

The personality-situation debate was constructive in that it challenged researchers
from both perspectives to clarify their positions and, ultimately, acknowledge that the
enduring individual and the environmental context both play roles in shaping behavior.
In fact, it appears that this conflict between trait and behaviorist positions helped inspire
the social-cognitive approach to personality, which purports to place the person,
environment, and behavior on equal footing in a reciprocal causal system (Bandura,
1986, 1999). Moreover, as threatening conditions often do, the person-situation debate
seemed to unify trait researchers, resulting in the development of a new integrative trait
conceptualization of personality: the Five-Factor Model.
2.4 **The Five-Factor Model of Personality**

After resolving the personality coefficient debate, trait theorists returned with renewed intensity to a longstanding project: the elucidation of fundamental traits that reflect the core structure of human personality (Wiggins & Trapnell, 1997). It was at this time that the previously mentioned “Big Five” Factors (Goldberg, 1990) emerged as a unified model of personality, though it was certainly not the first time a personality researcher had suggested these five factors (Digman, 1990). According to this Five-Factor Model (FFM) model, the diffuse and often overwhelming catalog of personality traits can be factor-analytically reduced to five core dimensions, akin to what have previously been called source or cardinal traits (Cattell, 1950; Allport, 1937). These five fundamental factors of personality focus on the extent to which a person is: (1) hardworking, organized, and ambitious (Conscientiousness); (2) gregarious, socially poised, and prone to positive emotions (Extraversion); (3) free from negative emotional tendencies, like anger, depression, and anxiety (Emotional Stability or, oppositely, Neuroticism); (4) prosocial and altruistic (Agreeableness); and (5) interested in new experiences, stimuli, and perspectives (Openness to Experience).

In an important review, Digman (1990) examined much of the history of trait psychology and found converging evidence for the aforementioned five orthogonal factors underlying the multitude of personality scales and batteries (cf. Wiggins & Trapnell, 1997). Digman and Takemoto-Chock (1981) and others (e.g., Norman, 1963) had already demonstrated that the five-factor solution best explained Cattell’s (1943, 1945) widely-studied trait variables. But the 1990 review went further, highlighting five
different research programs—dating as far back as the 1920s—that had independently recovered this five-factor explanation for the covariance among personality traits. Shortly after Digman’s (1990) publication, Goldberg (1990) published lexically-based semantic differential research in which participants rated the extent to which various trait adjectives described them. Across three samples who rated themselves on anywhere from 339 to 1,431 trait adjectives, the five-factor solution was consistently recovered.

Follow-up research confirmed Digman (1990) and Goldberg’s (1990) conclusions and provided initial evidence for the validity and reliability of self-reported Big Five ratings. Soon after the Digman and Goldberg publications, a wave of correlational and factor analytic studies upheld the reliability of the five-factor solution across a range of personality instruments and assessment methodologies (Costa & McCrae, 1992; cf. Carver & Scheier, 2000). In addition, Costa and McCrae presented diverse lines of evidence upholding the integrity of self-report ratings of the Big Five. For example, they conducted a number of studies incorporating self- and observer report and found significant agreement between these two sources (McCrae, 1982; Costa & McCrae, 1992, 1996), providing clear evidence that traits are not merely self-perceptions. McCrae and Costa (1983; Costa & McCrae, 1988) also produced extensive evidence that social desirability concerns do not significantly affect self-report ratings of the Five Factors.

In addition to this psychometric support for the Five-Factor Model (FFM), Costa and McCrae (1992, 1996; 1997) have highlighted several other findings that underscore the Five Factors’ substantive significance. First, behavior genetics studies indicate that the Big Five are substantially heritable (McCrae et al., 2000), which is consistent with
Allport’s (1937) argument that traits reflect genuine neurodynamic realities as opposed to being purely descriptive labels for observed behavior. In addition, longitudinal studies show the Big Five to be highly stable throughout the lifespan, particularly beyond age 30 (McCrae & Costa, 1984; Costa & McCrae, 1997). Moreover, the patterns of personality trait change that do occur over the lifespan have been replicated in diverse cultures, suggesting that they are likely to be maturation-based rather than cohort effects (McCrae et al., 1999). Similarly favorable results are found in other cross-cultural research, culminating in a recently published report in which the five-factor solution was recovered from a data set that represented 50 cultures (McCrae et al., 2005) and provided unparalleled coverage of African and Middle Eastern populations. All of this has led Costa, McCrae and their colleagues to argue that the Big Five are universal endogenous dispositions that are likely to be rooted in shared human biology (McCrae et al, 1999; McCrae et al., 2005).

The evidence that the Five Factors are robust across instruments, samples, cultures, and time is supplemented by numerous experimental and longitudinal studies demonstrating the power of the Big Five to account for regularities and individual differences in psychological functioning. For example, Larsen and Ketelaar (1989) found that the Big Five moderate the effects of experimental mood inductions: Extraverts are particularly susceptible to positive mood inductions, while those high in Neuroticism are especially vulnerable to a negative mood induction. In addition, prospective longitudinal research shows that Neuroticism—as measured by self- or spouse-report—is a substantial predictor of clinical depression measured 10 to 15 years later (Costa & McCrae, 1996).
Indeed, past Neuroticism is superior in predictive validity to gender, education, and age. Finally, as we will discuss shortly, Conscientiousness is a remarkably consistent predictor of numerous indices of job performance, across the full range of occupations and also across cultures. Considered collectively, the evidence for the existence and significance of five core personality factors is quite robust.

2.5 Channels of Trait Influence on Individual Functioning

Having established that traits are real psychological structures that shape human behavior in various ways, Funder (1991) and Costa and McCrae (1996) have suggested a number of mechanisms to explain how global personality traits like the Big Five exert their influence. First, to the extent that traits are reflections of innate temperament, they are likely to be partially rooted in stable neuroanatomical structures and biochemical processes. These neural mechanisms shape baseline levels and cycles of affect (Costa & McCrae, 1996; Watson & Clark, 1997), which in turn bias cognition in a variety of ways. Second, because traits can alter the stimulus value of various experiences, they affect peoples’ choice of and response to various environments (Funder, 1991; Allport 1937). For example, a highly Extraverted person is motivationally inclined to seek the reinforcement provided by animated social situations, while a more introverted individual may be overstimulated by, and therefore avoidant of, the same situations. Finally, the interrelated cognitive, affective, and motivational dispositions that are embodied in global traits tend to create self-perpetuating feedback loops. Thus, consider the disagreeable man whose offensive behavior elicits negative reactions from others which reinforce his negative perceptions and inspire future off-putting social behavior (cf. Costa & McCrae, 1996).
2.6 Traits in Vocational Psychology: Holland’s Theory

While the foregoing sketch speaks to both turmoil and progress during the last 35 years of trait research, it is noteworthy that vocational psychologists shown tenacious commitment to the trait perspective throughout this period (Dawis, 1992). Like their colleagues in personality psychology, trait-oriented vocational psychologists assume that people possess temporally and contextually stable mental dispositions that shape their thoughts, feelings, and behavior. In the case of career behavior, the mental dispositions of greatest relevance are those relating to vocational interest and choice. Also, just as personality researchers have sought to pinpoint those core traits that serve as the foundations of personality, trait vocational researchers have attempted to identify a small number of fundamental vocational interest traits that can account for individual differences in career choice and adjustment (Borgen & Lindley, 2003). This effort has culminated in Holland’s (1997) well-supported hexagonal model of vocational types.

Being an applied discipline, vocational psychology has always placed considerable emphasis on the interaction between a person’s traits and the broader environment. Parsons’s (1909) seminal work in vocational guidance suggested that career decision-making be guided by a process called “true reasoning,” wherein a person chooses among the career options in one’s environment on the basis of their correspondence to the individual’s ability and interest traits. Much later, Holland (1959) embraced this same person-environment matching approach when he proposed a model of six core interest traits and six corresponding vocational environments. Now, some forty-five years after his early theorizing, the “Holland hexagon” is widely recognized as
the definitive trait model of vocational interests. Indeed, as Swanson and Gore (2000) note in their review of advances in vocational research and theory, Holland’s model is the most widely studied career theory in history, and scholarly interest in the framework shows no signs of abating.

Holland’s (1997) basic assertion is that persons and academic-vocational environments can be categorized according to a six-category classification scheme, composed of Realistic, Investigative, Artistic, Social, Enterprising, and Conventional types (RIASEC). The Realistic type refers to an interest in activities that require manual dexterity, physical strength, or both—as typified in occupations like carpentry and firefighting. The Investigative type refers to analytical interests, as reflected in the work of computer programmers, scientists, and scholars in general. The Artistic type is relatively self-explanatory, with common Artistic pursuits including dance, creative writing, and sculpture. The Social and Enterprising types both focus on interpersonally-oriented work, though the former is geared toward helping and nurturing (e.g., teacher), while the latter emphasizes persuasion (e.g., sales, political strategy). Finally, the Conventional type corresponds to interests in work that often requires order and attention to detail, such as clerical work, accounting, or budget analysis.

In addition to the fundamental RIASEC types, Holland’s (1997) model embodies a number of other constructs and postulates that warrant some elaboration. First, it should be noted that Holland views social environments as aggregates of the personalities that inhabit that them. For example, a fire station will be a predominantly Realistic environment because Realistic interests typically rank highest for the majority of people working in that setting. Second, according to Holland, although the RIASEC types refer
fundamentally to interests, the types also incorporate broader personality and lifestyle
tendencies. For example, Holland (1997) suggests that Realistic individuals tend to be
conservative in their thinking, but are also inclined to enjoy sensation seeking behavior,
such as extreme adventure sports. Third, Holland (1997) argues that most individual
personalities incorporate multiple types, such that a given individual’s personality or
interest profile is often best described by a configuration of two to three RIASEC types.
Thus, a common practice is to describe a person according to her top three interest types,
using the first-letters of the themes grouped together in descending order (e.g., police
officer Jane may be an RSE).

2.7   **Deeper into Holland’s Theory: Calculus and Congruence**

Calculus and congruence are two other Holland concepts that merit brief
discussion. For Holland, calculus refers to the relationships among the six types. He
originally argued that the six types could be placed on the points of a hexagon in the R-I-
A-S-E-C order, with adjacent types showing strong relationships to one another,
non-adjacent types displaying weaker relationships, and opposite types showing virtually
no relationship or perhaps a negative relationship. For example, the Social and
Enterprising types are highly consistent insofar as they are both fundamentally
interpersonal in nature; while the Social and Realistic types are inconsistent, because one
is essentially concerned with physical work and “things,” and the other tends to be non-
physical and centers around interactions with people. Holland (1997) acknowledges that
certain individuals and environments can embody theoretically inconsistent types, such as Realistic and Social interests among many police officers, but he nonetheless avers that such violations of the calculus postulate are exceptions to the rule.

Research largely supports the calculus construct, particularly, the use of the R-I-A-S-E-C ordering of types as a representation of their empirical similarities. Correlations pairing interest ratings for adjacent RIASEC types are stronger than those that pair non-adjacent types, and the latter are stronger than opposite-type correlations (Fouad, 2002). However, the magnitudes of theoretically similar types of correlations (e.g., adjacent type correlations, opposite type correlations) are not entirely uniform, suggesting that the Holland interest structure does not conform to a perfect hexagon, but rather to a circular or spherical structure (e.g., Tracey & Rounds, 1996). Exact empirical accuracy notwithstanding, the data support the hexagon calculus as a heuristic model of the empirical relationships among the various interest dimensions (Holland, 1997; Swanson & Gore, 2000). Moreover, the general RIASEC structure is consistently reproduced across variables (e.g., activity interests, occupational interests, Holland self-efficacy) and also across gender, ethnic, and cultural groups (Fouad, Smith, Enochs, 1997; Fouad, Harmon, & Borgen, 1997; Day & Rounds, 1998; Fouad, 2002).

While calculus centers on the relationships among interest types, congruence describes the fit between an individual’s interests and his or her vocational environment. According to Holland, a Realistic-Investigative-Conventional (RIC) individual is unlikely to pursue a career as a psychotherapist. If she does, she will probably be dissatisfied and eventually move into a more congruent occupation (e.g., engineering). In summary,
congruence suggests that individuals seek academic and occupational environments congruent with their interests, are more satisfied learning or working in such environments, and are therefore more likely to persist in those programs and fields. Research has provided support for the first of these assertions, while congruence effects on stability and satisfaction are a subject of debate (e.g., Tinsley, 2000; Prediger, 2000).

In any case, the Holland interest configurations are quite stable over time, and they do predict people’s academic-vocational intentions and choices, both prospectively and concurrently (Holland, 1997; Swanson & Gore, 2000). For example, around 70% of participants in one study showed a high level of fit between their inventoried Holland interests and their college major choices (Hansen & Sackett, 1993). For this reason, the Holland RIASEC model has been incorporated by virtually all of the major commercial vocational interest inventories (Gelso & Fretz, 2001).

In summary, the Holland RIASEC framework is the most widely researched and applied model of interest traits in vocational psychology. Holland interests predict academic and vocational choices. Relationships among the interest themes are in keeping with Holland’s theoretical formulations, and this applies across diverse instruments and populations. In addition, to the extent that people’s interest scores are generally quite stable over time, the Holland dimensions seem to tap into an enduring psychological structure of interests. Finally, the hexagon model is parsimonious and practically useful, as it has helped countless individuals to better understand their interests and use that understanding to explore and pursue their careers.
2.8 **The Big Five and the Holland Six**

Given their common roots in the trait perspective, it is no surprise that empirical links between Holland’s RIASEC interest traits and the Five-Factor Model (FFM) have received considerable attention. Barrick et al. (2003) conducted a meta-analysis of Holland-FFM studies and found the following robust relationships: (1) Extraversion and Enterprising interests, (2) Extraversion and Social, (3) Openness and Artistic, (4) Openness and Investigative, (5) Agreeableness and Social, and (6) Conscientiousness and Conventional. By contrast, Neuroticism did not correlate with any of the Holland interest types, and Holland’s Realistic interest theme showed no significant relationship with any of the Big Five. Larson et al. (2002) conducted another meta-analysis, including only those studies that had used Costa and McCrae’s (1992) NEO-PI-R instrument as the Big Five measure. This analysis yielded results virtually identical to Barrick et al. (2003). For both meta-analyses, all of the significant relationships were positive and small-to-moderate in magnitude, and relationships tended not to differ by sex. Given the relatively modest size of the FFM-RIASEC correlations, Larson et al. (2002) speculated that examining the relations between more specific trait and interest dimensions might further clarify the precise linkages between these two construct domains.

Two subsequent studies have done just that. Sullivan and Hansen (2004) explored correlations pairing Holland themes with the “facet” scales of Costa and McCrae’s (1992) NEO-PI-R measure of the Big Five. Each of the Big Five Factors subsumes a number of narrower trait dimensions, or facets, that represent specific aspects of that factor: For example, the facets of Neuroticism are Anxiety, Angry Hostility,
Depression, Self-consciousness, Impulsiveness, and Vulnerability to Stress (Costa & McCrae, 1992). Consistent with Larson et al.’s (2002) speculation, Sullivan and Hansen (2004) found that vocational interests generally exhibited larger correlations with specific facets of the Big Five than with the Big Five themselves. Clarifying the relations between Holland’s Social dimension and the Big Five, Sullivan and Hansen found that the Warmth (Extraversion), Altruism, and Tender-mindedness (Agreeableness) facets were the best predictors of this Holland theme. Holland’s Investigative interest dimension showed its strongest relationship with the Ideas facet of Openness to Experience, while the Aesthetics facet of Openness was the best predictor of Artistic interests. Finally, Enterprising correlated most highly with the Assertiveness facet of Extraversion.

Sullivan and Hansen (2004) were particularly impressed by the finding that, after controlling for these facet-interest correlations, the original Holland-FFM relationships tended to disappear. They took this as evidence that focusing on the global Big Five “cloud[s] the more specific nature of the interest-personality association” (p. 295). For example, in applying this logic to the Extraversion-Enterprising association, Sullivan and Hansen suggested that Enterprising interests are “not associated with Extraversion per se, but rather with assertiveness specifically” (p. 295).

In a related study, Larson and Borgen (2002) examined the relationships between the Holland themes, narrower facets of those themes (i.e., the Strong Inventory Basic Interest Scales), the Big Five and their facets, and various scales of the Multidimensional Personality Questionnaire (Tellegen, 1982). Concerning the facets of the Big Five,
results were similar to Sullivan and Hansen (2004); however, Larson and Borgen (2002) also highlighted additional significant associations between Enterprising interests and Excitement-seeking (Extraversion), and also between Social interests and both Positive Emotions (Extraversion) and Trust (Agreeableness) facets. Larson and Borgen also found an indirect connection between the Big Five and Realistic interests: the Nature facet of Realistic interests correlated significantly with Excitement-seeking (Extraversion) and Aesthetics (Openness).

Although the Multidimensional Personality Questionnaire (Tellegen, 1982) is not explicitly grounded in the Five-Factor Model of personality, the MPQ does in fact tap several of the factors and their facets and has been empirically linked to the Big Five (Church, 1994). As a result, Larson and Borgen’s (2002) MPQ findings are informative. The authors found that (1) Realistic interests related significantly to MPQ Harm Avoidance (analogous to NEO Excitement-seeking); (2) Investigative related to Achievement (comparable to NEO Achievement-striving, a facet of Conscientiousness); (3) Artistic related to Absorption (similar to Openness); (4) Social related to Positive Emotions (equivalent to NEO Positive Emotions); and (5) Enterprising related to Social Potency (equivalent to NEO Assertiveness). While the Realistic-Harm Avoidance association was negative, all other significant correlations were positive.

Correlations between the MPQ and narrower facets of the Holland themes helped to clarify a number of personality-interests relations. Significant associations were as follows: (1) MPQ Social Potency related significantly to the Enterprising dimensions of Business Management, Merchandising, Law/Politics, and Public Service; (2) MPQ
Positive Emotions correlated with Public Service (Enterprising) and Social Service (Social); (3) MPQ Achievement related to Medical Science (Investigative); (4) MPQ Absorption correlated with Art, Music/Dramatics, and Writing.

Particularly interesting among these correlations were findings regarding Holland’s Realistic domain. Whereas the RIASEC-FFM meta-analyses have suggested little or no link between personality and Realistic interests, there are several connections between specific personality traits and narrower facets of Realistic interest. First, as noted previously, the Realistic domain is robustly related to Sensation-seeking, as measured by the Excitement seeking facet of NEO Extraversion and the MPQ Harm Avoidance scale. Second, in addition to the already-mentioned correlation between the Nature facet of Realistic and Openness to Aesthetics, Larson and Borgen (2002) found that the Mechanical and Adventure facets of Realistic interest both correlate negatively with MPQ Harm Avoidance. Finally, Mechanical and Adventure also both correlate positively with the MPQ Aggression scale, which reflects the intersection of high Angry Hostility (Neuroticism) and low Agreeableness (Church, 1994). Collectively, these results indicate that at least some Realistically-oriented individuals evince personalities marked by thrill-seeking behavior, an aesthetic interest in the physical environment, and a low threshold for aggressive engagement with others.

In summarizing this corpus of data, Larson and Borgen (2002) reached conclusions similar to Sullivan and Hansen’s (2004). First, Larson and Borgen noted that the Holland interests and personality show their greatest overlap at specific levels of measurement: In other words, correlations involving subthemes of Holland’s six interests
or narrower facets of the Big Five tend to be larger than correlations that pair one of the Big Five with one of Holland’s six general themes. In addition, regression analyses showed that prediction of Strong Interest Inventory Basic Interest Scales (subthemes of Holland’s six domains) was consistently increased when specific facets were added to models already including more general personality factors, such as the Big Five. Together, the Sullivan and Hansen (2004) and Larson and Borgen (2002) studies clarify the specific aspects of the Big Five that account for the FFM-RIASEC linkages.

2.9 Traits and Career Development: Beyond Interests

While the extensive RIASEC-Big Five literature has done much to clarify personality’s impact on vocational interests, it is well to remember that interests are only one aspect of career development. A substantial literature, summarized most recently by Tokar et al. (1998), indicates that the Big Five also predict a wide range of other career variables, including career development beliefs, the career decision-making process, job search behavior, job satisfaction, and various indices of occupational performance. Particularly prominent in this literature are Conscientiousness, Neuroticism, and Extraversion factors. What follows is a selective review of these findings, drawing heavily on Tokar and colleagues’ analysis.

2.10 Conscientiousness: Personnel Psychologist’s Best Friend?

Barrick, Mount, and Judge (2001) concluded their meta-analysis of personality and job performance with the bold assertion that Conscientiousness is “the trait-oriented motivation variable that industrial organizational psychologists have long searched for” (p. 21), referring to its power to predict desirable work outcomes. Specifically,
Conscientiousness is consistently associated with higher levels of job performance, greater frequency of desirable on-the-job behaviors, and fewer problematic work behaviors (Barrick et al., 2001; Salgado, 1997). Remarkably, these trends appear regardless of performance assessment method (e.g., self-report vs. supervisor evaluation) and across a broad range of occupational interest domains and prestige levels.

The following are just a few of the voluminous specific findings that speak to the salutary effects of Conscientiousness: Conscientious workers are more effective in reaching sales goals (Barrick, Mount, & Strauss, 1993); they are rated as more dependable and productive (Stewart & Carson, 1995); they perform better in the context of job-related training (Salgado, 1997); they are less prone to absenteeism (Judge, Martocchio, & Thoresen, 1997) and job burnout (Piedmont, 1993), and they are less likely to report on-the-job theft (Boye & Wasserman, 1996). In addition, there is evidence that Conscientious students demonstrate superior academic performance (Digman, 1990; Paunonen & Ashton, 2001). Importantly, social desirability does not affect this or any of the other Five Factors’ predictive validity in the domain of job performance (Ones, Viswesvaran, & Reiss, 1996).

As noted by Barrick et al. (2001), motivation is a particularly strong thread running through the Conscientiousness literature. Conscientious individuals have a constructive cognitive orientation, they set motivating goals for themselves, and they hold adaptive, prosocial values (cf. Costa & McCrae, 1992). With respect to cognition, they have greater self-efficacy for job searching, interviewing, networking, and self-exploration (Solberg et al., 1994), as well as team-based work (Thoms, Moore, & Scott,
Conscientiousness also correlates positively with beliefs about the importance of hard work, achievement, career-related risk-taking, and persisting despite setbacks (Holland, Johnston, Asama, & Polys, 1993).

Regarding actual behavior, Conscientiousness is a prominent theme in the narratives of successfully self-employed adults (Lee & Cochran, 1997); and, even when unemployed, Conscientious respondents report greater job-seeking frequency (Wanberg, Watt, & Rumsey, 1996) and more assertive job hunting behavior (Schmit, Amel, & Ryan, 1993). The role of self-motivating goals in linking cognition and behavior is nicely illustrated by Barrick et al. (1993), who found that the effect of Conscientiousness on employees’ sales volume and supervisor performance ratings was largely mediated by workers’ autonomous goal-setting and goal commitment.

2.11 Neuroticism: When Career is Half Empty

Whereas Conscientiousness seems to describe the profile of a model employee, Neuroticism portends maladaptive career development. In reviewing the literature on measures of Neuroticism and its facets (e.g., anxiety, pessimism), Tokar et al. (1998) cataloged numerous troubling findings. Neuroticism correlates with: lower quality of job search activities; lower personality-job congruence; greater career indecision; less job satisfaction; more negative perceptions of occupational stressors and strain; and poorer job performance ratings. The primary pathways from Neuroticism to career development dysfunction seem to involve affective-perceptual biases, motivational problems, and low stress tolerance.
Simply put, and in keeping with the essence of the construct, Neurotic individuals see the world through gray-tinted glasses. Spector and O’Connell (1994) discovered that pre-employment negative affectivity predicts job satisfaction one year later, while Watson and Slack (1993) showed that a regression model combining measures of negative and positive affectivity predicts multiple aspects of job satisfaction two years later. This result persists even after controlling for job change and objective occupational quality variables. Neurotic individuals are more likely to believe that work interferes with their personal relationships (Mughal, Walsh, & Wilding 1996), and college students’ negative affect predicts their perceptions of on-the-job stress one year after graduation (Spector & O’Connell, 1994). Clarifying the relationship between Neuroticism and job satisfaction, Judge and Hulin (1993) found that this correlation is mediated by generalized subjective well-being. Thus, the research indicates that Neurotic individuals’ negative career-related perceptions may have more to do with characterological mental states than the objective work environment.

Closely related to Neurotics’ perceptual-affective bias is a motivational avoidance of challenging goal-directed pursuits in the career development domain. Neuroticism (negative correlation) is second only to Conscientiousness (positive) in predicting job performance ratings (Barrick et al., 2001), and Neurotic adults tend to work in jobs with low levels of autonomy, variety, and complexity (Spector, Jex, & Chen 1995). Work by Holland et al. (1993) sheds light on the cognitive-motivational roots of this
underachievement. They found that Neuroticism correlates negatively with beliefs concerning the importance of hard work, achievement, career-related risk taking, and persistence in overcoming obstacles.

Finally, Neurotic individuals are likely to experience vacillation, paralysis and apathy in the career decision-making and job search processes. This includes impaired vocational identity formation (Holland, Gottfredson, & Baker, 1990; Holland et al., 1993), problem-solving deficits, dependent decision-making, affective and informational indecision, goal instability, and low decision-making efficacy (Chartrand et al., 1993; Multon, Heppner, & Lapan, 1995); as well as a non-assertive approach to job hunting, (Schmit, Amel, & Ryan, 1993) and lower efficacy for virtually all other aspects of the job search (Solberg et al., 1994).

In addition to the aforementioned career deficits, Neurotic individuals seem to have particular difficulty coping with job-related stressors. For example, even after accounting for age, flying experience, and simulator performance, Neuroticism showed a significant negative correlation with pilots’ flight performance ratings (Hörmann & Maschke, 1996). Negative affectivity also correlates positively with burnout among healthcare workers caring for HIV/AIDS patients (Bellani et al., 1996). Company records even indicate that, after controlling for demographic and work environment variables, Neuroticism predicts onsite accidents (Iverson & Erwin, 1997).
2.12 Extraversion: Feeling Good and Doing Well

As with Neuroticism, evidence suggests that Extraversion influences career development primarily through perceptual-affective and motivational channels. This makes theoretical sense insofar as Watson and Clark (1997) have argued that positive affect is the very core of Extraversion. Specifically, they have presented data showing that the associations between positive emotionality and each of the other Extraversion facets are stronger than any of the other correlations among those other facets. Costa and McCrae (1992, 1996) also include Positive Emotions as a facet of Extraversion, and they have theorized that Neuroticism and Extraversion are the temperament-level counterparts of positive and negative state affect.

A number of findings illuminate how the perceptual-affective components of Extraversion shape vocational functioning. Along these lines, a basic but significant finding is that Extraverts have positive affective reactions to a broader range of vocational activities. Both Larson and Borgen (2002) and Staggs, Larson, and Borgen (2003) found that the Multidimensional Personality Questionnaire’s (MPQ) Positive Emotions scale (which subsumes Extraversion) shows positive correlations with all six Holland interest domains, and most of these associations are statistically significant \((p < .01)\). None of the other MPQ traits show the same indiscriminately positive association with vocational interests. Direct and indirect indices of Extraversion also correlate significantly with job satisfaction (Tokar et al., 1998; Seibert & Kramer, 2001), with positive affectivity predicting job satisfaction up to two years later, even after controlling
for job change and occupational quality variables (Watson & Slack, 1993). The Positive Emotions aspect of Extraversion also relates to career-related cognitive clarity, including positive correlations with career decidedness and goal stability (Multon, Heppner, & Lappan, 1995).

Watson and Clark (1997) argue that the Extraversion/Positive Emotions factor is a manifestation of the so-called behavioral activation system (BAS), an adaptive neuropsychological mechanism that orients the organism toward potentially pleasurable stimuli (see also Watson, Wiese, Vaidya, & Tellegen, 1999). Supporting this assertion is a good deal of evidence for heightened motivation among Extraverts. Specifically, Watson and Clark (1997) note findings indicating that Extraverts are ambitious, perfectionistic, and willing to put in long hours to reach their goals. In addition, factor analyses of the MPQ and MPQ Brief Form confirm that the measure’s Achievement scale loads most highly on the Positive Emotionality factor, as do Social Potency and Social Closeness (Patrick, Curtin, & Tellegen, 2002). In addition, although Costa and McCrae (1992) conceptualize Achievement-Striving as a facet of Conscientiousness, their measure of this facet actually exhibits a sizable correlation with Extraversion ($r = .41$, Costa & McCrae, 1992). Similarly, the Achievement scale of the Adjective Checklist shows significant loadings on both Extraversion and Conscientiousness (Piedmont, McCrae, & Costa, 1991).

Watson and Clark (1997) observe a reciprocal relationship between the affective, affiliative, and motivational aspects of Extraversion/Positive Emotions. For example, there is experimental evidence that social interaction creates a more positive mood state
(McIntyre, Watson, Clark, & Cross, 1991), but positive affect inductions also result in increased social engagement (Cunningham, 1988). Similarly, Positive Emotions are associated with increased energy and alertness, as well as optimism and confidence, which facilitate effort and high performance (Watson & Clark, 1997). Experiences of success and accomplishment then perpetuate the same positive mood state that helped produce those outcomes. Correlational evidence for trait positive emotionality’s robust relationship to social engagement and goal-directed behavior, along with experimental evidence that manipulating one of these variables tends to produce the others, lends support to the behavioral activation system construct, as does neurobiological research (Depue & Collins, 1999).

Not surprisingly, Extraverts demonstrate heightened motivation and achievement in various aspects of career behavior. These include: (1) higher frequency and quality of job search activities (Tokar et al., 1998); (2) more assertive job search strategies (Schmit, Amel, & Ryan, 1993); (3) greater job search self-efficacy (Solberg et al., 1994; Tokar et al., 1998); (4) higher salaries and greater instances of attaining managerial levels (Melamed, 1995; Seibert & Kramer, 2001); (5) greater frequency of job change, due largely to promotions, and greater likelihood of making a job change when dissatisfied (Leong & Boyle, 1997; Judge, 1993); (6) prominence in a qualitative study of successful self-employed adults (Lee & Cochran, 1997); and (7) meta-analyses documenting positive association with job performance outcomes for interpersonally-oriented occupations (Tokar et al., 1998), including management and police work (Salgado, 1997).
This heightened effort and achievement associated with Extraversion seems to be partially rooted in cognitive processes. Thus, contrary to Neuroticism, Extraversion correlates positively with beliefs that hard work and achievement are important, that risk-taking is a necessary part of career success, and that persistence in the face of obstacles is rewarded (Holland et al., 1993).

Unlike Conscientiousness, however, Extraversion has been occasionally associated with certain negative career behaviors. For example, Extraversion was inversely related to supervisors’ ratings on citizenship and dependability among hotel workers (Stewart & Carson, 1995). In addition, Extraverted tele-sales workers (Furnham & Miller, 1997) and non-academic university workers (Judge, Martocchio, & Thoresen, 1997) displayed a greater frequency of absences. In one sample of machinists, supervisor performance ratings correlated negatively with Extraversion. Finally, higher levels of Extraversion discriminated a sample of white collar criminals from a group of non-imprisoned white collar workers (Collins & Schmidt, 1993).

Thus, as a motivating personality variable, Extraversion is less straightforward than Conscientiousness. We have already observed that Extraversion’s ability to predict positive job performance outcomes is relatively circumscribed to interpersonal work (i.e., Holland Social and Enterprising themes), whereas Conscientiousness seems to have a trans-occupational positive effect on performance (Barrick et al., 2001). Also clouding a positive interpretation of Extraversion are the aforementioned findings regarding absenteeism; white collar crime; lack of intrinsic motivation (e.g., citizenship); lower performance ratings in non-interpersonal settings (e.g., machining); higher frequency of
absent days; and higher incidence of job attrition in order to obtain raises and promotions. Moreover, with respect to Enterprising occupations, Stewart (1996) found evidence that incentive-based sales reward structure (i.e., explicit financial incentives for customer retention and reaching sales goals) moderates the relationship between Extraversion and those outcome variables. Therefore, it seems that unless an occupation (a) is highly congruent with Extraverts’ intrinsic interests or (b) provides considerable financial-status rewards, Extraversion is unlikely to show a strong relationship with performance outcomes and may even presage egocentric and ethically questionable behavior.

2.13 **Openness: Mixed Bag**

More so than any of the other Big Five, Openness presents a mixed bag of findings. As delineated by McCrae and Costa (1997), Openness is a mental-motivational set defined by intellectual curiosity, ambiguity tolerance, non-authoritarianism, and interest in variety and new experiences. This appears to confer some career development advantages. Openness correlates positively with assertive job hunting (Schmit et al., 1993) and career-related self-exploration (Reed, Bruch, & Haasel, 2004) and is linked to a broader “agency” construct that in turn correlates with job search self-efficacy (Solberg et al., 1994).

However, McCrae and Costa (1997) also point out that nonconformity and atypical thought processes are other hallmarks of Openness. Along these lines, high-Openness individuals report a preference for unstructured, intrinsically satisfying, self-improvement-oriented work (Holland et al., 1993). In addition, Openness correlates negatively with career information search behavior (Reed et al., 2004) and shows no
significant relationship to vocational identity clarity (Holland et al., 1990, 1993). In the context of career exploration and decision processes, Reed et al. conjecture that Open individuals may be more interested in imagining possibilities (e.g., self-exploration) than doing the more mundane reality-testing (e.g., career information searching).

With the exception of responsiveness to job training, Openness does not show robust positive relationships with any of the key occupational outcome variables (Tokar et al., 1998). Salgado’s (1997) European meta-analysis found that Openness significantly predicted performance and training proficiency for police officers and skilled laborers. However, Barrick et al.’s (2001) meta-analysis—which included but also went beyond Salgado’s data—found no robust relationship between Openness and job performance, though they did replicate the positive Openness-training performance association. In addition, countering Salgado’s (1997) European findings, Johnson’s (1997) sample of American police officers evidenced a negative relationship between performance ratings and an Openness facet (Intellectance, as measured by the California Psychological Inventory); and Hayes, Roehm, and Castellano (1994) found a number of negative relationships between Openness and supervisor performance ratings of injection mold machine operators. Moreover, a recent study by Siebert and Kramer (2001) found a negative relationship between Openness and salary level and no relationship between Openness and career satisfaction.

In summary, aside from its relationships with vocational interests (Holland Artistic and Investigative) and with training proficiency, Openness shows no consistent positive relationship to career outcome variables; and the findings of individual studies
sometimes suggest problematic career outcomes for Open individuals (e.g., satisfaction, career information search motivation, functioning in structured, mundane work environments).

2.14 **Agreeableness: Playing (Too) Well with Others**

As noted elsewhere (Swanson & Gore, 2000), widely replicated relationships between Agreeableness and career development are largely confined to occupational interests, where this factor consistently correlates with interests in helping and interpersonally nurturing careers (i.e., Holland’s Social theme). However, there are several isolated findings that illuminate other ways in which Agreeableness may shape the career experience. Summarizing the vocational literature, Tokar et al. (1998) noted a number of positive attributes associated with Agreeableness. For example, Agreeableness relates positively to team-based work functioning (cf. Barrick et al., 2001), and high-Agreeableness police officers have fewer complaint letters in their records (Johnson, 1997). In addition, Agreeableness correlates with endorsement of various constructive career beliefs (e.g., importance of risk taking, work ethic, persistence [Holland et al., 1993]), and some evidence suggests that it may buffer against the emotional exhaustion and depersonalization facets of job burnout (Piedmont, 1993).

However, Tokar et al.’s (1998) review also reveals an offsetting “nice guys finish last” trend. Agreeableness scores negatively predict occupational advancement among salespeople (Johnson, 1997), correlate negatively with managerial performance in high-autonomy positions, and also negatively predict preference for aggressive, outcome-oriented, and decisive organizational cultures (Judge & Cable, 1997). In addition,
Agreeableness correlates negatively with assertiveness (Caldwell & Burger, 1997; see also Costa & McCrae, 1992), career satisfaction (Siebert & Kramer, 2001), and extrinsic career success variables (Salgado, 1997), such as salary. Siebert and Kramer (2001) speculate that Agreeable people are more likely to be exploited at work and less likely to take credit, deny blame, or otherwise promote themselves.

2.15 Seeing the Forest: Traits in Perspective

In review, the trait perspective provides a parsimonious set of variables for understanding the big picture of career development. Holland’s (1997) six interest traits serve as an empirically-supported framework that succinctly represents individual configurations of vocational interest and allows us to better understand the similarities and differences among people and among occupations. In addition, the extensive Holland-Big Five literature helps clarify the links between individual differences in interests and broader individual psychological differences. Thus, for example, we can confidently assert that the Investigative interests of the scholar and the Artistic interests of the filmmaker are both in part rooted in an underlying tendency to explore, experiment, and ponder ideas, possibilities, and the nature of reality (i.e., Openness to Experience).

Traits also illuminate how interrelated clusters of psychological tendencies exert pervasive effects on the entire phenomenon of career development. Using the Big Five as a consensual model of core personality structure (cf. McCrae & Costa, 1999), we have seen how global traits shape the overall valence of career development through two primary motivational channels: attitudinal and affective. Here, attitude refers to a
network of interrelated beliefs, values, and behavioral tendencies characterized by drive, discipline, order, and integrity (Conscientiousness). For the Conscientious person, there is inherent value in a job well-done, as evidenced by the variable’s association with measures of integrity and its cross-contextual ability to predict desirable career development attitudes and outcomes (Tokar et al., 1998; Barrick et al., 2001). On the other hand, Extraversion and Neuroticism seem to affect career development primarily through affective motivational channels. Extraversion involves an alert, mentally energized, and confident frame of mind that enhances career-related enjoyment and facilitates achievement of personal goals. By contrast, Neuroticism is an ongoing undercurrent of maladaptive perceptual-affective activity, experienced in various forms, such as anxiety, self-doubt, frustration, sadness, and pessimism. Global Neuroticism scales, along with measures of these more specific manifestations, are consistently associated with impaired career-related exploration, decision-making, goal-setting, satisfaction, and performance.

2.16 And the Trees: Social-Cognitive Theory

Although the Holland Six and the Big Five provide a solid general map of the relationship between personality and career development, scholars are calling for greater clarification of the precise cognitive and motivational mechanisms that connect traits and career behavior (Barrick et al., 2001; Larson & Borgen, 2002). That is, the general answers provided by trait research often beg questions of their own. For example, what cognitive and behavioral mechanisms allow Conscientious individuals to regulate their behavior so effectively? How, specifically, do Neurotic individuals manage to sabotage
their career development and job performance? Are there context-specific mental processes, beyond the Big Five, that could increase our power to predict career behavior and outcomes? Social-cognitive theories (Bandura, 1986, 1997; Mischel & Shoda, 1999) have focused considerable attention on these more precise, domain-specific paths by which personality affects career, and as such, they serve as a valuable complement to the trait perspective.

The social-cognitive perspective (Bandura, 1986, 2001; Mischel & Shoda, 1995; Cervone, 2005) is an outgrowth of psychology’s behaviorist tradition, with its focus on acquisition of behavioral regularities through observational learning and associative conditioning. Reflecting this environmental-determinist heritage, contemporary social-cognitive theory views sociocultural context, both distal and proximal, as a prime mover in the development of individual personality. However, the current model takes a significant departure from classic behaviorism in that it emphasizes cognition as an important mediator of these environmental effects. Indeed, citing such diverse examples as political activists and high-performance athletes, Bandura (1997, 2001) argues that the effect of personal beliefs on behavior can be so powerful and pervasive that it frequently overrides the influence of current environmental influences and constraints. Clearly, this represents a fundamental paradigm shift, given behaviorism’s historical view of human cognition as little more than an epiphenomenon (Skinner, 1989, 1990).

In the social-cognitive model, personality is conceptualized as a dynamic web of interacting beliefs about the self and the surrounding world, rooted in past contextual experiences and constantly updated by new ones (Mischel & Shoda, 1999; Bandura,
Because individual experiences vary considerably across time and context, social-cognitive researchers tend to view personality as an open system that displays both predictability and plasticity (Bandura, 1999). People are not viewed in terms of broad, pervasive dispositions; rather, personality is a constellation of beliefs and motivational proclivities, some of which may be dormant or active at any given moment depending on the situation at hand (Mischel & Shoda, 1995; Mischel & Shoda, 1999). Taking interpersonal behavior as an example, the social-cognitive theorist would argue that Jane Doe’s decision to go to a party will depend upon those aspects of the party (number and nature of the guests, activities planned, etc.) that have salience in relation to her self-perceptions, goals, and expectations (Mischel & Shoda, 1999; Cervone, 2005)—not merely on some decontextualized propensity for Extraversion or Introversion.

2.17 Bandura’s Social-Cognitive Theory

Although the label “social-cognitive” describes a family of theories (Funder, 2001), Bandura’s (1986, 2001) model has received the most attention among personality and vocational psychologists. Bandura’s (1997) major focus is on human motivation, where he has applied his concepts to the entire gamut of goal-directed behaviors, from business management and classroom learning to safe sex and environmental advocacy. This emphasis on motivation helps to explain Bandura’s popularity among vocational psychologists (e.g., Lent et al., 1994; Judge, Bono, Erez, & Locke, 2005), as motivational processes are accorded a prominent role in virtually all aspects of career development.
Bandura (2001) has identified a number of interrelated social-cognitive processes that govern human motivation, but his greatest emphasis has been on three particular variables: outcome expectations, goals, and self-efficacy expectations. Outcome expectations are, quite simply, beliefs about the future—especially the likely consequences of one’s own behavior. Across individuals and situations, beliefs vary concerning the relative impact of one’s own behavior vis-à-vis other causal forces. For example, a person may be confident in her abilities as an actress but may also believe that the supply of talented actresses far outweighs the demand. Another person may have limited confidence in his public speaking skills but believe that it is God’s will for him to become an evangelist. In both cases, the individual’s belief about the future and the forces that determine it—outcome expectations—can have significant implications for goals and behaviors.

Vocational researchers have been particularly interested in environmental support structures and barriers to career development as a partial determinant of outcome expectations (Lent et al., 2000; Lent, et al., 2001,. 2003). For example, members of historically oppressed populations—including women, people of color, and individuals from lower socioeconomic classes—often perceive considerable barriers to occupational achievement. These negative outcome expectations, which are often accurate, can result in academic disengagement, insufficient career planning, and, ultimately, suboptimal career outcomes.

In social-cognitive theory, goals are conceptualized as prominent players in determining career behavior and ultimate outcomes (Lent et al., 1994). Whereas most of us will indulge various career interests and daydreams at different points in our lives,
goals are the cognitive-motivational bridge that translates abstract musings into concrete actions. In social-cognitive theory, outcome expectations will definitely constrain or enhance the kinds of goals one entertains, but the goals themselves are the activators of purposeful behavior. That is, major life projects (such as one’s career) are most likely to be successful when the individual establishes short- and intermediate-term goals that act as steps toward longer-term goals (Bandura, 2001). These proximal subgoals, as Bandura (1997) calls them, make overwhelming projects seem manageable and provide intermittent reinforcement as one progresses.

2.18 Self-Efficacy: Cornerstone of Social-Cognitive Theory

Although both goals and outcome expectations figure prominently in social-cognitive theory, self-efficacy is without a doubt the theory’s central construct (Bandura, 1977, 1997). Simply put, self-efficacy refers to a person’s confidence in his or her ability to execute a specific behavior or successfully perform a class of interrelated behaviors. According to Bandura (1977, 1997), self-efficacy expectations are often the strongest predictor of the extent to which a person will attempt, persist, and succeed in performing a given goal-directed activity—whether the behavior in question is overcoming a snake phobia or mastering mathematical concepts.

The development of the self-efficacy construct was heavily influenced by Bandura’s earlier studies of modeling behavior and observational learning (e.g., Bandura, Ross, & Ross, 1961). Drawing on this and other learning research, Bandura suggested four causal determinants of self-efficacy expectations: (1) prior behavioral experience in the relevant domain; (2) vicarious observation of others’ behavior in that domain; (2)
levels of affective arousal experienced in association with the behavioral domain; and (4) verbal messages encoded in the context of the domain (e.g., encouragement, criticism). According to Bandura (1977), people use these aspects of their life experience as information in their subjective appraisals of self-efficacy. Thus, self-efficacy is not an isolated concept but rather the centerpiece in a theoretical model of how experiential inputs are translated into goal-directed behavioral output (i.e., goal setting, attempts, persistence, and success).

Because a person can have highly divergent confidence levels across various life domains, Bandura (1997) argues that self-efficacy expectations should be viewed as contextual or domain-specific, rather than as a part of some global self-confidence trait. From Bandura’s (1997) perspective, it is injudicious to speak of a person’s overall self-confidence when, in fact, a person may have high confidence with respect to writing a short story but low confidence in the domain of auto repair. The best way to predict performance in either of these areas, according to social-cognitive theory, is to examine the person’s previous experiences related to those activities, along with the belief structures that have developed as a result of those experiences.

2.19 Self-Efficacy in Vocational Psychology

In many ways, this emphasis on specific classes or contexts of behaviors was ripe for application to vocational psychology, which has always been interested in knowing why some people are drawn to Realistic environments, others to Social occupations, and so forth. Whereas, a global self-efficacy construct might predict overall aspiration and adaptation levels, the notion of varying, possibly divergent domain-based self-efficacy
expectations has the potential to illuminate the varying interest patterns and choices different people display. Thus, it is little surprise that vocational psychologists were among the earliest investigators to appropriate the self-efficacy construct (e.g., Hackett and Betz, 1981; Betz & Hackett, 1981).

While career theorists had previously viewed vocational choice as a function of abilities and interests, career self-efficacy theory has shown that beliefs about abilities play a prominent role in shaping both interests and the choice process (Betz, 2001; cf. Lent et al., 1994). For example, self-efficacy is a central mediator of the effects of gender and prior experience on individuals’ vocational interests, goals, and choices (Betz, 2001; Swanson & Gore, 2000). Self-efficacy for various occupational domains also significantly predicts occupational choice even after accounting for vocational interests (Donnay & Borgen, 1999). In addition, interventions designed to increase domain-specific vocational efficacy also enhance interest in those areas (Betz & Schifano, 2000; Luzzo et al., 1999). To provide a fuller picture of this literature, what follows is a review of findings from some of the most fruitful vocational self-efficacy research programs.

2.20 Gender, Self-Efficacy, and Investigative Careers

Hackett and Betz (1981) were the first to apply self-efficacy theory to career development, focusing on gender differences in vocational interests and choice. Noting the significant under-representation of women in science and technology fields, Hackett and Betz theorized that a relative lack of math and science self-efficacy might explain this gender difference. To test this hypothesis, Betz and Hackett (1981) constructed a self-efficacy scale measuring self-reported confidence for 10 skills prominent in
traditionally male-dominated occupations, and 10 skills from female-dominated occupations. The authors found the expected self-efficacy differences: women showed significantly lower self-efficacy than men in traditionally male skill domains, with the opposite holding for traditionally female skill domains. More importantly, these self-efficacy differences predicted gender differences in the range of traditional and nontraditional occupations considered, providing correlational support for a possible causal link between self-efficacy and career choice.

Follow-up studies focused on gender differences in mathematics, with research again demonstrating greater relative self-efficacy among males (Betz & Hackett, 1983), which predicted greater interest in applied science and technology careers. Using path analysis, Hackett (1985) showed that self-reported gender-role socialization, high school mathematics preparation, and prior math achievement predict math self-efficacy, which, in turn, acts as a significant predictor of math-related college major choice (Hackett, 1985). Subsequently, Lent, Lopez, and Bieschke (1991) found that differences in math-related background experience, especially past math performance, mediate the relationship between gender and mathematics efficacy; and Lapan, Shaughnessy, and Boggs (1996) showed that mathematics efficacy and interests mediate the effects of gender differences on math-science major choice.

Having solidly established self-efficacy as a mediator of gender and background effects on mathematics interest and major choice, researchers began to build a broader base of research concerning self-efficacy’s role in facilitating entry into the Holland (1997) Investigative fields of math, science, and technology. Lent, Brown, and Larkin
(1986) found that low and high self-efficacy engineering majors displayed significant differences on several measures of academic performance and persistence. In a replication study, science-technology efficacy significantly predicted grades in technology classes, persistence in related majors, and the range of career options considered (Lent et al., 1986). Later research—including correlational studies (Lent et al., 1991), thought-listing protocols (Lent, Brown, Gower, & Nijjer, 1996), and experimental interventions (Luzzo et al., 1999)—consistently demonstrated that personal performance accomplishments are the strongest predictor of mathematics efficacy.

2.21 Efficacy and Vocational Interests

The early success of self-efficacy in helping to explain scientific and mathematical career behavior inspired applications to the full spectrum of vocational domains (Rooney & Osipow, 1992), culminating in Lapan, Boggs, and Morril’s (1989) research concerning self-efficacy for the RIASEC (Holland, 1997) interest themes. Lapan et al. found that self-efficacy played a significant role in mediating the relationship between gender and interest differences, with women showing lower Realistic (physical, manual work) and Investigative (math, science) efficacy and interests than men. These results were replicated by Rooney (1991) and Lenox and Subich (1994), and Rooney also found higher levels of Social (helping, service) self-efficacy among women.

Building on this research, Betz et al. (1996) developed the Skills Confidence Inventory (SCI), a measure of RIASEC theme efficacy that has been studied in large samples of students and employed adults and which is now widely administered in conjunction with the Strong Interest Inventory. Research using this instrument provides
further support for self-efficacy’s importance in shaping career behavior. For example, as noted previously, Donnay and Borgen (1999) showed that, even after accounting for Holland RIASEC interests, self-efficacy makes an incremental contribution to the prediction of vocational choice. Indeed, intervention studies by Betz and Schifano (2000) and Luzzo et al. (1999) showed that exercises designed to enhance Realistic and Investigative self-efficacy lead to concomitant increases in participants’ interest in those areas. In the case of mathematics efficacy, one of Luzzo et al.’s intervention groups reported post-treatment mathematics interests that were nearly one and a half standard deviations above control group post-test interests.

2.22 Career Decision Efficacy

Given self-efficacy’s obvious impact on career interests, performance, and persistence, Taylor and Betz (1983) suggested that the actual process of career decision-making could be reconceptualized in self-efficacy terms. At that time, Crites’s (1978) model of career maturity was among the most prominent frameworks for understanding normal and problematic career decision-making processes. According to Crites (1978), effective career decision-making requires: (1) accurate knowledge of one’s skills, interests, and so forth (self-appraisal); (2) gathering of information about occupations; (3) selection of appropriate goals; (4) making plans for the future; (5) and solving problems encountered in the process of exploration and goal pursuit. Using Crites’s framework, Taylor and Betz (1983) developed a self-report inventory measuring self-efficacy for each of these five competency areas.
Two decades worth of subsequent research have confirmed the validity of self-efficacy as a fundamental mechanism for discriminating career maturity from impaired career decision-making (see Betz & Luzzo, 1996). For example, Taylor and Popma (1990) found that Taylor and Betz’s (1983) Career Decision Self-Efficacy Scale (CDSE) significantly differentiates among college students at three levels of career decidedness: (1) declared majors, (2) those with tentative majors chosen, and (3) undecided students. Peterson (1993) found that CDSE surpasses a number of related variables in predicting college students’ perceptions of academic and social integration on campus, both of which have been suggested as keys to college retention. In addition, a study by Blustein (1989) showed that CDSE significantly predicts students’ engagement in career exploration activity; indeed, the CDSE’s predictive power outmatches that of demographic variables (age and gender) and a measure of career goal instability. Betz and Luzzo (1996) reviewed psychometric evidence for the CDSE construct and its measure, noting that both the original 50-item CDSE and a 25-item short form consistently display high reliability and significant relationships with various indicators of career decidedness and vocational identity clarity.

2.23 Beyond Self-Efficacy: Social Cognitive Career Theory

Inspired by the productivity of career self-efficacy research, Lent et al. (1994, 2000) proposed a more comprehensive Social Cognitive Career Theory (SCCT). In addition to self-efficacy perceptions, SCCT incorporates outcome expectations, goals, and perceptions of the environment into a model of interest formation, academic-vocational choice, and career-related performance. In this theory, distal variables—
ability, temperament, race, gender, life experience—exert an indirect effect on the three career outcome variables. These effects are mediated by cognitive processes and structures, particularly self-efficacy and outcome expectations. Those cognitions, in turn, have a direct effect on career interests, goals, actions, and outcomes.

At the center of Social Cognitive Career Theory (SCCT) are the relations among self-efficacy, outcome expectations, and goals. According to Lent et al. (1994), self-efficacy exerts a direct effect on career choice and performance, as well as various indirect effects that result from efficacy’s influence on interests, outcome expectations, and goals. Outcome expectations, which are partially caused by self-efficacy beliefs, also affect vocational choice and action, though not to the extent that self-efficacy does. Finally, as suggested by Bandura (1986, 1997), goals—which are heavily influenced by self-efficacy and outcome expectations—play a prominent role in motivating individuals to translate selected interests into tangible actions (e.g., choosing a major, applying for a position). Thus, it is through the cognitive channels of efficacy, outcome beliefs, and goals that distal variables like temperament, ability, and experience give rise to vocational behavior.

Social Cognitive Career Theory (SCCT) has inspired extensive research, which has supported its fundamental propositions in a variety of academic-vocational domains (Fouad & Smith, 1996; Lent et al., 1991; Fouad, Smith, & Zao, 2002). Self-efficacy continues to be the most prominent SCCT construct, with research confirming its effect on interests, outcome expectations, and goals, as well as its superiority over outcome expectations in predicting career behavior (e.g., Lent et al., 2003). The literature also
highlights goals as a proximal cause of career outcomes, mediating the effects of interests, efficacy, and expectations. For example, goals predict course-taking (Lips, 1992) and enrollment in a related major field of study (Lapan, Shaughnessey, & Boggs, 1996), and they fully mediate the effect of self-efficacy on measures of persistence, such as continued pursuit of a specific major over time (Lent et al., 2003).

Social Cognitive Career Theory’s most significant contribution to career psychology may be its focus on a broader range of cognitive and experience variables that affect career outcomes, particularly for culturally diverse populations. For example, research has highlighted how acculturation levels, parental role models, and culturally-informed values shape the three primary social-cognitive variables. Along these lines, Tang, Fouad, and Smith (1999) found that Asian-American participants with higher levels of acculturation had stronger self-efficacy expectations for non-culturally-stereotypical career domains. Self-efficacy, in turn, predicted career choice intentions. Other findings provided further support for the importance of culturally learned cognitions; for example, contrary to findings with Anglo-American samples, personal interests were not a significant predictor of career choice intentions for Tang et al.’s (1999) Asian American sample.

Social Cognitive Career Theory has also heightened scholarly attention to experiences and perceptions of racism, sexism, and environmental support in career development. In a test of SCCT among young Mexican American women, Flores and O’Brien (2002) found that students’ anticipation of ethnic and gender discrimination barriers to various occupational pursuits was a significant predictor of those students’
occupational aspiration levels, with stronger perceptions of such barriers leading to lower-prestige career aspirations. In a sample of ninth graders from an urban school setting, Kenny et al. (2003) also found that barriers exerted a small, significant impact on school engagement, work attitudes and aspirations. Interestingly, perceptions of general and kinship-related social support were an even stronger (positive) predictor of these outcomes. The literature concerning acculturation, perceptions of available support, and expectations of discrimination highlight the diverse range of cognitive and social learning variables that shape career outcomes via the more proximal channels of self-efficacy, outcome expectations and goals.

2.24 Moving toward Integration: Traits, Interests, and Self-Efficacy

Borgen and Lindley (2003) summarized evidence that personality traits, self-efficacy, and vocational interests are three of the most empirically supported person variables in the study of career development, and they also encouraged continued research to further clarify the relationships among these variables. As we have seen throughout the present review, there is much that we already know. First it is clear that self-efficacy and career interests are closely related. Domain-consistent interests and self-efficacy consistently correlate at around .50 (Lent et al., 1994); efficacy-building interventions increase not only self-efficacy, but also interests (Betz, 2001); and, more recently, evidence for a reciprocal causal relationship between the two constructs has been presented (Nauta, Kahn, Angell, & Cantarelli, 2002).
In addition to the relationships between efficacy and interests, meta-analyses of Big Five-RIASEC correlations reveal robust relationships between traits and interests: (1) Extraversion with Social and Enterprising; (2) Openness with Artistic and Investigative; (3) Agreeableness with Social; and (4) Conscientiousness with Conventional. These personality-interest relationships are now being clarified by studies examining correlations among narrower facets of the Big Five and the Holland themes (Larson & Borgen, 2002; Sullivan & Hansen, 2004). For example, it seems that the Assertiveness facet accounts for much of the relationship between Extraversion and business management and law/politics interests.

Although we now have conclusive evidence that the Big Five and self-efficacy influence vocational interests and other aspects of career behavior, there has been very little cumulative research into the connection between the Big Five and self-efficacy. Lent et al.’s (1994, 2000) Social Cognitive Career Theory (SCCT) holds that self-efficacy is a primary mediator of global personality effects on vocational interests. Thus, given the correlations between personality and interests and efficacy and interests, we would expect to see some pattern of correlations connecting personality to efficacy. Indeed, the Big Five-Efficacy connection represents the conceptual missing link in the integration of trait and social-cognitive formulations of career development. Fortunately, researchers are beginning to explore this relationship.
2.25 The Missing Link: Generalized Self-Efficacy and the Big Five

To this point, Social Cognitive Career Theory has focused largely on how specific types of cognitions affect related outcomes, such as the effect of mathematics efficacy on choice of math-related major (cf. Lent et al., 1994). Indeed, research consistently shows that interest-efficacy correlations are strongest when the efficacy and interest domains are similar: For example, Investigative efficacy exhibits a stronger correlation with Investigative interests than with Realistic interests and vice versa (Betz et al., 1996). Such findings also hold for the broader SCCT framework, where correlations among goals, efficacy, and outcome expectations for a common career interest domain are stronger than correlations pairing variables from unrelated domains (Smith & Fouad, 1999).

Despite these findings and Bandura’s (1997) rejection of generalized self-confidence constructs, a number of scholars insist that something like a global self-efficacy trait does exist (e.g., Sherer et al., 1982; Judge et al., 2002). In particular, Borgen and Lindley (2003) note that, although efficacy expectations can vary across domains, some people are nevertheless more efficacious than others across a range of life contexts. For example, Betz and colleagues (Betz et al., 1996; Betz et al., 1998) have consistently found significant positive correlations among the six self-efficacy dimensions that correspond to Holland’s (1997) six vocational interest themes. In a more direct exploration, Betz and Klein (1996) reported that a measure of generalized self-efficacy correlated significantly with all six Holland efficacy themes in a male sample and four of the six themes among female participants. A follow-up study by Lindley and
Borgen (2002) found that generalized efficacy correlated significantly with two and three of Holland’s themes among women and men, respectively.

Given these findings, generalized self-efficacy reflects one promising point of intersection for social-cognitive and trait theories. Borgen and Lindley (2003) speculate that general efficacy may reflect a dispositional confidence in one’s ability to master new situations, thus facilitating goal approach and persistence behavior across a range of domains. This conjecture is consistent with some recent social-cognitive formulations. For example, Lent et al. (2000) speculated that dispositional affect (Extraversion and Neuroticism, in Big Five terms) is a global personality domain that may significantly impact a range of specific career-related self-efficacy appraisals as well a person’s overall efficacy for coping with career development setbacks. Could it be that generalized self-efficacy is largely a confluence of some of the Big Five Factors? A good deal of research points toward this conclusion.

Tokar et al.’s (1998) review emphasized Conscientiousness, Neuroticism, and Extraversion as the personality factors most consistently related to adaptive, self-confident career behavior (i.e., generalized career efficacy). For example, Conscientiousness and Extraversion both routinely correlate with beliefs and outcomes suggestive of high overall personal self-efficacy, such as willingness to take risks, a belief in the importance of persistence, and a desire for high levels of achievement. Extraverts in particular enjoy high levels of positive affect, including career satisfaction, and they are disproportionately likely to enjoy promotions, management opportunities and high salaries. Meanwhile, Conscientiousness emerges as the most robust existing
predictor of positive career performance and is associated with positive supervisor
evaluations, integrity, autonomous goal-setting and achievement, and lower
absenteeism—to name just a few of its benefits. Neuroticism, by contrast, predicts career
inefficacy, including low career decision self-efficacy, low job satisfaction, poor job
performance, and job burnout.

Not surprisingly, each of these three factors has been proffered as a possible
generalized self-efficacy trait. For example, Costa and McCrae (1992) define the
Competence facet of Conscientiousness as “the sense that one is capable, sensible…and
effective” and note that this facet “is most highly associated with self-esteem and internal
locus of control” (p. 18). In fact, the International Personality Item Pool’s (Goldberg,
1999) version of the Competence facet scale is actually called “self-efficacy.” By
contrast, Watson and Clark (1997) champion Extraversion as a kind of efficacy trait,
noting that Extraverted individuals experience high baseline feelings of confidence and
optimism and are ambitious and achievement-oriented. Finally, Judge, Erez, Bono, and
Thoresen (2002) have presented extensive psychometric evidence that widely used
measures of generalized efficacy and Neuroticism are so highly (negatively) correlated
that they are virtually redundant and may in fact be different labels for the same factor.

2.26 The Big Five and Career Efficacy

Although the preceding findings provide some insight into relationships between
the Five Factors and generalized self-efficacy, to date only three studies have focused
specifically on the relationship between the Big Five and career-related self-efficacy.
Moreover, even this research raises questions of its own: Two of the studies (Nauta,
2004; Reed et al., 2002) measured the Big Five using the Adjective Checklist (ACL), as opposed to the more widely-used NEO-PI-R, while the third study (Schaub & Tokar, 2005) did use the NEO but did not publish a correlation matrix. Even so, all three studies provide some evidence for both general and content-correspondence relationships between the Big Five and career self-efficacy. Here, general relationships refer to Big Five variables that display effects on a broad range of self-efficacy domains; while content-correspondence effects exist when one of the Big Five predicts self-efficacy for a vocational domain that involves trait-relevant qualities (e.g., Extraversion predicting Enterprising efficacy).

In terms of the three published studies of career efficacy and the Big Five, content-correspondence effects for the Big Five and Holland career efficacy mirror the Big Five-Holland interest literature. Both Nauta (2004) and Reed et al. (2002) found small-to-moderate correlations for (1) Agreeableness and Social (efficacy), (2) Conscientiousness and Conventional, (3) Extraversion and Enterprising, (4) Extraversion and Social, (5) Openness and Artistic, and (6) Openness and Investigative. Nauta also found that self-efficacy mediated most of the Big Five’s effects on Holland interests. Schaub and Tokar’s (2005) path analysis replicated and extended these findings. Specifically, several personality-to-efficacy-to-interest paths—(1) Openness-Artistic-Artistic, (2) Extraversion-Social-Social, (3) Extraversion-Enterprising-Enterprising, (4) Conscientiousness-Conventional-Conventional, and (5) Agreeableness-Social-Social—significantly improved the model vis à vis a competing model that included only personality-to-interest paths. In summary, there is evidence that the Big Five relate to
vocational interests in a largely indirect fashion, exerting their impact through the mediating mechanism of domain-relevant vocational efficacy.

Nauta (2004) and Rottinghaus et al. (2002) also found some more generalized effects of the Big Five on career self-efficacy. Openness was the only factor to show statistically significant correlations with all six Holland efficacy themes in both studies. In each study, all of these correlations were positive, and four of the six were moderate or large. Nauta also found small, negative relationships between Neuroticism and all six Holland efficacy themes (five were statistically significant); but Rottinghaus et al. found only two significant relationships—negative correlations with Realistic and Enterprising. Conscientiousness showed significant positive associations with four of six efficacy themes in the Rottinghaus sample (all but Realistic and Artistic) and three of six in Nauta’s sample. Finally, in both samples, Extraversion correlated not only with Agreeableness and Enterprising efficacies, but also with Artistic efficacy. In contrast to Nauta (2004) and Rottinghaus et al. (2002), Schaub and Tokar (2005) confined their path models to content-correspondence analyses and did not present data regarding possible general effects of the Big Five on Holland theme efficacy.

2.27 The Current Study

The studies conducted by Nauta (2004), Rottinghaus et al. (2002), and Schaub and Tokar (2005) are welcomed efforts at identifying the empirical relations between the Big Five and vocational efficacy. However, as previously noted, these studies also raise questions. First, given that the NEO-PI-R is the most commonly used indicator of the Big Five, the Nauta and Rottinghaus et al. studies should be replicated with this
instrument. Although Schaub and Tokar (2005) collected concurrent data for the NEO and the Skills Confidence Inventory (SCI), they did not report simple correlations. Moreover, they limited their reported analyses to content-correspondence relationships (e.g., Extraversion-Enterprising) and did not report possible general effects (e.g., Extraversion correlating positively with all efficacy variables). Thus, we currently do not know whether the NEO-PI-R and SCI will manifest the same empirical relationships as those found for the SCI and the Adjective Checklist (i.e., Nauta, 2004; Rottinghaus et al., 2002).

A second and related question concerns the significant positive relationships between the Openness scale of the Adjective Checklist (ACL) and the Holland efficacy themes (Nauta, 2004; Rottinghaus et al., 2002). These findings are a departure from the extant personality and career literature insofar as Openness has not been a consistent predictor of positive career development, whereas Neuroticism (negative correlate), Extraversion, and Conscientiousness have (cf. Tokar et al., 1998). Along these same lines, previous research and theorizing have not suggested a strong link between Openness and generalized self-efficacy, whereas generalized efficacy has been linked to Conscientiousness (Costa & McCrae, 1992), Extraversion (Watson & Clark, 1997), and Neuroticism (Judge et al., 1997). In summary, given the discrepancy between recent vocational efficacy research and the broader career development literature, it is worthwhile to reexamine the role of Openness as a possible predictor of vocational self-efficacy across domains.
Given these unresolved issues, the present research adds to our understanding of general and content-correspondence effects in two significant ways. First, the current study uses the NEO-PI-R short form (the NEO Five-Factor Inventory) as its measure of the Big Five, thus establishing continuity with the largest proportion of the extant Big Five literature while also providing a rigorous test of the generalizability of the Adjective Checklist (ACL) findings (i.e., Nauta, 2004; Rottinghaus et al., 2002). Second, the current study incorporates the 17 scales of the Expanded Skills Confidence Inventory, as well as the Career Decision Self-Efficacy scale. The former instrument measures self-efficacy for a variety of vocational domains beyond the six general Holland themes, while the Decision Efficacy scale assess an entirely different aspect of career development efficacy. Obviously, this substantially expands the range of vocational efficacy variables assessed, thus providing a more rigorous test of general effects than has previously been reported. To put it another way: To the extent that one of the Big Five exhibits consistent, significant correlations with several, diverse efficacy variables, we can have more confidence in asserting that that factor exerts a pervasive effect on vocational efficacy.

2.28 Hypotheses for the Present Study

Self-efficacy is routinely conceptualized as a domain-specific property (e.g., math efficacy, leadership efficacy), but it is likely that certain core personality characteristics are associated with a more generalized vocational efficacy (Borgen & Lindley, 2003). Indeed, as noted already, there is some indication that certain personality traits are associated with a global sense of self-confidence (generalized self-efficacy)—that is, a
general sense that one is capable and effective in addressing challenges and reaching
goals (Judge et al., 2002; Watson & Clark, 1997; Costa & McCrae, 1992). Following this
reasoning, some of the Big Five Factors are hypothesized to consistently correlate with
career self-efficacy across domains.

Generalized effects are expected for Neuroticism, Conscientiousness, and
Extraversion. First, because Neurotic individuals have low generalized self-efficacy
(Judge et al., 1997) and tend to be highly susceptible to stressors and negatively-biased
perceptions (Costa & McCrae, 1992), it is reasonable to hypothesize that Neuroticism
will negatively affect career self-efficacy irrespective of the specific career development
domain. By contrast, Conscientious individuals are confident, determined, and
industrious in planning and carrying out goals (Costa & McCrae, 1992); therefore, this
factor should be positively associated with career efficacy across vocational themes.
Finally, because Extraversion involves a dispositional tendency to experience positive
affect, including optimism and self-assuredness (Watson & Clark, 1997), it is reasonable
to expect that Extraverts will experience high self-efficacy across vocational domains.

In addition to these generalized effects, domain-specific effects consistent with
those reported by Nauta (2004), Rottinghaus et al. (2002), and Schaub and Tokar (2005)
are expected. Specifically, Openness should correlate positively with self-efficacy for the
Investigative (i.e., science-oriented) and Artistic themes of the Skills Confidence
Inventory, as well as the narrower Science, Creative Production, and Cultural Sensitivity
scales of the Expanded Skills Confidence Inventory (Betz et al., 2003). Agreeableness
should correlate with self-efficacy for the Social (interpersonal service-oriented) theme,
as well as the ESCI Helping, Teaching/Training, Cultural Sensitivity, and Teamwork scales. Extraversion is predicted to relate positively to all of the aforementioned efficacy domains associated with Agreeableness, as well as efficacy for the Enterprising (i.e., persuasive, entrepreneurial) theme and the Sales, Leadership, Public Speaking, and Organizational Management scales. Finally, Conscientiousness should correlate with self-efficacy for the Conventional theme and the Project Management and Office Services scales of the ESCI.

2.29 **Summary**

A number of research programs are facilitating heightened interface between the trait and social-cognitive theories of personality. Scholars have consistently identified large positive correlations between interest and self-efficacy for each of the Holland RIASEC themes (Betz et al., 1996; Lent et al., 1994). In addition, multiple meta-analyses (Barrick et al., 2003; Larson et al., 2002) confirm that core personality traits, the Big Five Factors, correlate with vocational interests in predictable ways (e.g., Extraversion predicts interest in Enterprising careers, and Openness predicts interest in Artistic pursuits).

More recently, three studies have investigated the role of the Big Five in predicting vocational self-efficacy, providing evidence that the same relationships that exist among personality and interest domains exist among personality and the corresponding efficacy domains (Nauta, 2004; Rottinghaus, et al., 2002). Moreover, self-efficacy appears to partially mediate the Big Five’s effect on interests (Nauta, 2004; Schaub & Tokar, 2005). Finally, there is some evidence that Openness and Neuroticism
exert effects on several vocational efficacy domains (Nauta, 2004; Rottinghaus et al., 2002); however, the Openness finding is inconsistent with a body of previous research on career development (Tokar et al., 1998) and personality (Judge et al., 1997), and the Neuroticism finding has not been consistently uncovered (e.g., Rottinghaus et al., 2002). No study to date has reported simple correlations pairing scales from the NEO measure of the Big Five and the Skills Confidence Inventory measure of Holland efficacy themes. The present study provides that data, and also examines a range of other career efficacy domains, (e.g., career decision-making efficacy, scientific career efficacy), helping us to discover which—if any—of the Big Five exert a generalized, cross-domain effect on vocational self-efficacy.
CHAPTER 3

METHODOLOGY

3.1 Preliminary Power Analysis

Cohen’s (1988) discussion of statistical power guided the determination of an adequate sample size for the proposed study. Cohen (1988) offered a power level of .80 as suitable for most social science research designs, and he also established some conventional cut-off points for interpreting effect sizes. Specifically, Cohen suggested that Pearson rs of .10, .30, and .50 or standardized mean differences (Cohen’s d) of .20, .50, and .80 correspond to small, medium, and large effects, respectively. For the proposed study, the goal was to detect any $r \geq .20$ and any $d \geq .35$, using the $p < .01$ one-tailed significance level. Based upon Cohen’s (1988) tables, 247 usable cases were needed to conduct meaningful analyses under these specifications.

3.2 Participants and Procedure

Participants were 301 students enrolled in introductory psychology courses at The Ohio State University. All introductory psychology students are assigned a research exposure component of their coursework, and one option for fulfilling this requirement is participation in psychology department studies. Thus, while research participation is
voluntary, subjects receive course credit for their involvement. The present study was one among many options available to those students who chose to participate in research. Groups of 20 or fewer participants completed a computer-administered questionnaire battery. Students spent anywhere from 20 to 45 minutes completing the battery, with an observed average completion time of around 30 minutes. Participants completed a total of five inventories, three of which are discussed in this report. Upon completion, all participants were offered a debriefing letter. An a priori decision was made to exclude data from any participant who omitted 10 or nine item responses. This was true for nine of the original 301 participants, leaving a final sample of 292 participants. The final sample was predominantly first year (82%), female (female \( n = 216 \), male \( n = 76 \)), young adult (\( M = 18.59 \) years, \( SD = 1.53 \)), and white (European American = 79.9%; African American = 7.1%, Asian American = 5.1%, International = 2.4%, Latino/Latina = 1.7%, Native American 0.3%, Other = 2.7%).

3.3 **Instruments**

*The Expanded Skills Confidence Inventory* (ESCI; Betz et al., 2003) is a 186-item version of the Skills Confidence Inventory (SCI; Betz et al., 1996). ESCI items instruct participants to rate their confidence levels for performing various tasks (e.g., conduct a financial audit) or completing courses (e.g., math) according to a 5-point Likert-style scale, ranging from “no confidence at all” to “complete confidence”. The ESCI includes the original six scales of the SCI, which measure self-efficacy for Holland’s (1997) six RIASEC vocational domains. In addition, the ESCI contains 17 scales measuring more specific job-related skill domains (e.g., using technology, cultural sensitivity).
There is significant evidence for the ESCI’s psychometric quality. In large samples of adults and college students, the original SCI displays internal consistency ranging from Cronbach’s Alpha .80 to .88 (Harmon et al., 1996; Parsons & Betz, 1998), while Alphas for the newer BCSs range from .80 to .94 with a median of .90 (Betz et al., 2003). Three-week test-retest correlations for the original SCI varied from .83 to .88 (Parsons & Betz, 1998), and the median test-retest correlation for the Expanded scales was .85 (Robinson & Betz, 2004). Validity evidence for the ESCI includes factor analytic support for scale structure, meaningful correlations with corresponding measures of Holland (1997) interests and other measures of self-efficacy, incremental validity in predicting occupational choice, and responsiveness to theory-grounded intervention (Betz et al., 1996; Betz et al., 2003; Betz & Schifano, 2000; Donnay & Borgen, 1999).

*The Career Decision Self-Efficacy Scale—Short Form* (CDSE-SF; Betz, Klein, & Taylor, 1996) is a 25-item measure of self-efficacy for skill domains viewed as crucial for effective career development (cf. Crites, 1978). These are: (1) accurate self-appraisal, (2) gathering occupational information, (3) goal selection, (4) making plans for the future, and (5) problem-solving. Though designed to consist of five subscales, factor analytic evidence indicates that the CDSE and its Short Form are best construed as measures of a general career decision self-efficacy dimension. The internal consistency Alpha for the CDSE-SF has ranged from .93 to .94 (Betz & Luzzo, 1996). Temporal stability of the measure can be inferred from research using the 50-item form, which yielded a .83 six-week test-retest coefficient. There is an extensive body of supporting
validity data (see Betz & Luzzo, 1996), including significant relationships between the CDSE scales and independent indices of career indecision, fear of occupational commitment, career maturity, and career exploratory behavior.

This study provided an initial test of a minor revision to the CDSE. The new item “Use the Internet to find information about occupations that interest you” was included as a possible replacement for the original item “Find information in the library about occupations you are interested in.” Item-total correlations for the new and original items were .54 and .50, respectively; and Cronbach’s Alpha for the CDSE-SF was .96 regardless of which item was included in the reliability analysis. Based on these favorable results, the “Internet” item was included in the final 25-item scale, and the “library” item was discarded. In addition, because recent research has shown that a 5-point item response scale produces results comparable to the original 10-point continuum (Betz, Hammond, & Multon, 2005), the 5-point scale was adopted for the present study.

The NEO Five-Factor Inventory (NEO-FFI; Costa & McCrae, 1992) is a 60-item, 5-point Likert-style instrument that measures each of the Big Five personality factors. The instrument is a short form, consisting of the psychometrically strongest items from the revised NEO Personality Inventory (NEO PI-R). Costa and McCrae (1992) offer an extensive discussion of the reliability and validity of the NEO PI-R and FFI. Respective internal consistency Alphas of .86, .77, .73, .68, and .81 were obtained for the NEO-FFI Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness scales, while three-month test-retest correlations ranged from .75 to .83. Validity evidence for the NEO-FFI includes independent self and observer agreement, concurrent predictions
of real-world behavior (e.g., alcohol consumption, GPA; Paunonen, 2003), and discriminant and convergent correlations with similar instruments. Also, insofar as the NEO-FFI is derived from the strongest NEO-PI-R items, the short form is likely to embody much of the additional validity evidence associated with its parent measure.
CHAPTER FOUR

RESULTS

4.1 Scale Properties and Descriptive Statistics

Tables 1-3 present sample means and standard deviations for all scales, as well as internal reliability statistics and within-instrument scale intercorrelations. Tables 4-6 display gender comparison results.

4.1.1 NEO Five-Factor Inventory Scale Properties

This sample’s NEO Five-Factor Inventory (NEO-FFI) descriptive statistics and scale properties (Table 1) are comparable to those produced in previous NEO-FFI research. Cronbach internal reliability Alphas range from .71 to .90, deviating on average only .03 points from the corresponding Alphas computed for Costa and McCrae’s (1992) N = 1539 sample. Means for the present sample, which range from 38.9 to 45.3, are in most cases more than 10 points larger than Costa and McCrae (2004) found, but other samples have produced similar numbers (e.g., Bruck & Allen, 2003; Schaub & Tokar, 2005).

The NEO-FFI scale intercorrelation pattern (Table 1) is largely consistent with previous research. Correlations for the various combinations of Agreeableness, Conscientiousness, Neuroticism, and Extraversion are all in the same direction and
comparable in magnitude to the corresponding correlations from McCrae and Costa’s (2004) high school and adult samples. Openness is the one exception. For the current sample, the largest Openness correlation is with Neuroticism \((r = .16, p < .01)\), whereas McCrae and Costa (2004) found non-significant negative Openness-Neuroticism correlations in their samples. For the present sample, Openness displayed negative, statistically non-significant correlations with Agreeableness and Extraversion, whereas McCrae and Costa (2004) reported small, positive correlations for both pairings in both of their samples. The Openness-Conscientiousness relationship is ambiguous: This sample’s \(r\) was small, negative, and statistically non-significant, while the corresponding Costa and McCrae (2004) \(r\)s were both non-significant (\(|rs| < .10\)) and in opposite directions for the two samples.

Table 4 displays means and standard deviations by gender, as well as \(t\) and \(d\) statistics for the null hypothesis and effect magnitude, respectively. Women receive higher scores for all five of the NEO-FFI scales; statistically higher levels of Agreeableness and Extraversion; and small, practically significant effects for Conscientiousness \((d = .29)\), Agreeableness (.41), and Extraversion (.46). The Agreeableness effect magnitude is comparable to the data reported in Costa and McCrae (2004). The current sample gender differences differ from the literature in two respects: Whereas this sample shows a small, significant effect for Extraversion and no significant effect for Neuroticism \((d = .10\) in this sample), other researchers have found a small gender effect for Neuroticism and no significant effect for Extraversion (e.g., Costa and McCrae, 1992; McCrae and Costa, 2004).
In summary, despite some interesting departures, the current sample’s averages, gender differences, item-scale correlations (Cronbach’s Alpha), and convergent and discriminant inter-scale correlations are consistent with previous samples’ responses to the instrument. With the possible exception of Openness, whose NEO-FFI correlations deviate somewhat from McCrae and Costa’s (2004), the inventory displays the same general properties in this sample that it has elsewhere.

4.1.2 **Expanded Skills Confidence Inventory (ESCI) Scale Properties**

Scale reliabilities, intercorrelations, and gender differences for the six RIASEC efficacy themes (Tables 2 and 4) generally replicate previous research with the instrument (see Betz et al., 1996). Cronbach Alphas range from .82 to .86, and the average RIASEC intercorrelation is \( r = .38 \) (all \( p < .01 \)). In accord with Holland’s hexagonal model, four of the efficacy themes exhibit their strongest correlations when paired with an adjoining Holland hexagon theme (e.g., R and I, S and E). The exception is the correlation between Investigative and Conventional, which is the strongest for either scale. Also consistent with Holland’s (1997) model, each scale’s lowest intercorrelation is with its hexagon opposite (e.g., R and S, I and E). Finally, in keeping with previous research (e.g., Betz et al., 1996), men show statistically higher levels of Realistic and Conventional efficacy, whereas women demonstrate statistically higher Social efficacy (all \( p < .01 \)). As shown in Table 4, all scales but Enterprising demonstrate small-to-medium gender effect sizes (Cohen, 1988).
Correlations pairing RIASEC efficacy themes with each of the 17 expanded efficacy themes (Table 3) are consistent with Holland’s hexagon and follow the pattern found in Betz et al. (2003). The Realistic scale shows it’s largest correlations with Mechanical ($r = .89$, five items overlap) and Using Technology (.45) and its weakest relationships with Helping, Cultural Sensitivity, and Writing (.16 to .17). Investigative relates most strongly to Science (.83) and Mathematics (.62) efficacy and most weakly to interpersonal efficacy domains, such as Sales and Cultural Sensitivity. The Writing and Creative Production scales both exhibit their strongest correlations when paired with the Holland Artistic efficacy theme and vice versa. Social and Enterprising both correlate highly with a broad range of interpersonal efficacy domains (e.g., Helping, Leadership, Public Speaking), though Enterprising shows decidedly stronger relationships with business and influence-oriented domains (e.g., Sales and Organizational Management $rs = .78$ and .82).

Tables 5 and 6 present gender comparisons and correlations for the expanded efficacy themes. Although the large number of statistics precludes detailed comment, the reader can observe that gender differences mirror those found for the six general RIASEC themes: For example, women show greater relative confidence for Helping ($d = .61$) tasks, while men show greater confidence for Mechanical ($d = .61$) activities. Correlations between scales also reflect the connections to the underlying Holland efficacy themes. For example, Pearson $rs$ for Mathematics-Science ($r = .48$), Helping-Cultural Sensitivity (.63), and Leadership-Public Speaking (.85) are the strongest for either scale in each pair. By contrast, expanded efficacy scales exhibit their weakest
correlations with their Holland hexagon opposites, exemplified in the Mechanical-Helping (.12), Science-Sales (.12), and Mathematics-Leadership (.17) correlations. Despite this hexagon-consistent pattern of correlations, the presence of moderate associations between such seemingly unrelated scale pairs as Writing-Teamwork \((r = .47)\) and Mechanical-Teaching (.39) supports the inference that a generalized self-efficacy mechanism feeds into more content-specific capability appraisals (cf. Borgen & Lindley, 2003; Sherer et al., 1982).

4.1.3 Career Decision Self-Efficacy Scale Properties

Data reflecting the psychometric properties of the Career Decision Self-Efficacy Short Form (CSDE-SF) are presented in Tables 2 and 4, along with the previously reviewed RIASEC efficacy theme data. Consistent with previous research (e.g., Betz & Luzzo, 1996), the CDSE-SF displays a very high level of internal consistency (Cronbach’s Alpha = .96) and does not yield significant gender differences (Table 4). Presumably reflecting the generalized self-efficacy mechanism, the CDSE-SF exhibits small-to-moderate correlations with all of the RIASEC efficacy themes (all significant \(p < .01\)). The strongest correlations are with Social, Enterprising, and Investigative (see Table 2), which is consistent with the CDSE items’ emphasis on analytical and interpersonal aspects of career exploration and choice.

4.2 Personality and Career Efficacy: Substantive Correlations

The preceding results establish the basic integrity and quality of this sample’s data. That is, internal reliability, gender differences, and intra-inventory correlation patterns align with extant research and make theoretical sense (e.g., Mechanical and
Realistic correlate much more strongly with each other than either correlates with Enterprising). These findings establish a trustworthy foundation for interpretation of the more substantive question: How do the Big Five personality factors relate to career self-efficacy as a general and content-specific construct?

4.2.1 **NEO-FFI and Holland Efficacy Variables**

Table 7 presents correlations between the RIASEC efficacy themes and each of the Five Factors. Conscientiousness and Neuroticism emerge as the most robust predictors of Holland theme self-efficacy: Conscientiousness evinces statistically significant ($p < .01$) positive correlations with four of the themes (average $r$ for Conscientiousness and the six themes $= .25$), and Neuroticism displays significant negative relationships with five of the Holland themes (average $r = -.26$). The large number of significant correlations, relatively uniform size of those correlations, and their content-independence (e.g., Conscientiousness correlates equally Investigative and Social) are consistent with the inference that Conscientiousness and Neuroticism have, respectively, positive and negative effects on general career self-efficacy.

Consistent with meta-analyses of the Big Five and the Holland interest themes (Larson et al., 2002; Barrick et al., 2003), Openness has its strongest correlations with Artistic and Investigative self-efficacy ($rs = .47$ and .24, respectively). On the other hand, the general pattern of Openness-RIASEC theme relationships is more complex. The average of the Openness-RIASEC correlations ($|r| = .21$) is inflated by the Openness-Artistic correlation, which—owing to the thematic similarity between psychological openness and artistic creativity—is the largest of all correlations that pair a
Five-Factor Model (FFM) variable with a RIASEC variable. When this correlation is excluded, the average Openness-RIASEC correlation is .15. Moreover, the Openness-Conventional correlation is actually negative ($r = -.03$). By contrast, even after removing their single largest RIASEC correlations, average Conscientiousness-RIASEC and Neuroticism-RIASEC $rs = .22$ and .24, respectively. Thus, rather than demonstrating a pervasive impact on career efficacy, the Openness-RIASEC efficacy relationship mirrors the Openness-RIASEC Interest relationship pattern: Openness shows a strong thematic and empirical connection to Artistic and Investigative efficacy themes ($rs = .47$ and .24, respectively) but not to the other four themes.

Like Openness, Extraversion exhibits its largest correlations with the RIASEC efficacy themes suggested by Big Five-Holland Interest meta-analyses. Presumably reflecting a social ascendance mechanism, Extraversion’s correlations with Social and Enterprising efficacy are $r = .41$ and .42, respectively ($p < .01$). Also in line with the Big Five-Interest research, the third largest Extraversion correlation is with Artistic ($r = .23$, $p < .01$). Remaining relationships are all positive, but small: $rs = .12$, .14, and .13 for Realistic, Investigative, and Conventional.

Finally, Agreeableness fails to demonstrate any significant correlations with the Holland efficacy themes. This suggests that, despite a significant relationship between a friendly, compassionate disposition (Agreeableness) and an interest in helping and nurturing activities (Larson et al., 2002; Barrick et al., 2003), one’s level of perceived compassion and friendliness does not affect perceptions of skill in successfully performing various career activities—including helping activities.
4.2.2 NEO-FFI and ESCI Expanded Efficacy Scales

The pattern of correlations between the Five Factors and the 17 expanded career self-efficacy themes parallels the FFM-Holland Efficacy relationships. As Table 8 shows, Conscientiousness has a robust, positive relationship with career self-efficacy: Twelve of the correlations are significant ($p < .01$), and eight are above $r = .25$. Relative to the other four factors, Conscientiousness shows a uniquely pervasive, positive relationship with domains requiring analytical (e.g., Mathematics, $r = .24$) and organizational (e.g., Data Management) skill. Once again, Neuroticism shows a global negative impact on career self-efficacy, with 15 of the correlations reaching statistical significance ($p < .01$) and 10 exceeding, $r = -.30$. Because 11 of the 17 expanded efficacy scales concentrate on interpersonal and oral communication skills, Extraversion also emerges as a robust positive predictor of career self-efficacy ($r > .30$ for 8 of the 17 themes; $p < .01$ for 12 themes). With the exception of its correlation with Cultural Sensitivity ($r = .40$), the impact of Openness on career self-efficacy is confined to domains of Investigative and Artistic efficacy, such as Science and Creative Production (four Pearson correlations significant, $p < .01$). Finally, Agreeableness again fails to relate significantly to career self-efficacy, though its largest correlation is with the interpersonally-oriented Teamwork scale ($r = .14$).

4.2.3 NEO-FFI and Career Decision Self-Efficacy

Whereas the Expanded Skills Confidence Inventory (ESCI) provides nearly exhaustive coverage of self-efficacy for job skill domains, the short form of the Career Decision Self-Efficacy Scale (CDSE-SF) focuses on efficacy for the multi-component,
developmental process of career exploration and choice. This includes items reflecting self-regulation, social assertiveness, information gathering and processing, and making decisions under uncertainty. Thus, with the inclusion of the CDSE-SF alongside the ESCI, the present data set provides significant representation of the entire career self-efficacy construct domain.

With that in mind, it is noteworthy that Conscientiousness ($r = .48$), Neuroticism ($r = -.44$), and Extraversion ($r = .37$) all exert moderate effects on Career Decision Efficacy (Table 7), whereas Agreeableness and Openness do not. Thus, results for the Five-Factor Model and Career Decision Efficacy parallel the FFM-RIASEC efficacy results in implicating Neuroticism and Conscientiousness as significant influences on career self-efficacy as a general construct domain. Further, in the context of Extraversion’s numerous significant relationships with the RIASEC and expanded efficacy themes, the moderate CDSE-Extraversion correlation suggests that this factor also has a reasonably generalized, positive relationship with the broad domain of career self-efficacy.
<table>
<thead>
<tr>
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<th>2.</th>
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<th>4.</th>
<th>5.</th>
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<td>2. Agreeableness</td>
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Table 1. NEO-FFI Intercorrelations and Descriptive Statistics.
Note: N = 292. All rs ≥ .15 are statistically significant (p < .01). Cronbach Alphas shown in parentheses.

<table>
<thead>
<tr>
<th></th>
<th>1.</th>
<th>2.</th>
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<th>4.</th>
<th>5.</th>
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<td>3. Artistic</td>
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<td>.39</td>
<td>(.84)</td>
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<td>4. Social</td>
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<td>.48</td>
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<td>(.86)</td>
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Table 2. Correlations and Descriptive Statistics: Holland and Career Decision Efficacy.
Note: N = 292. All rs ≥ .15 are statistically significant (p < .01). Cronbach Alphas shown in parentheses.
### Holland Self-Efficacy Theme

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<th>A</th>
<th>S</th>
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<th>C</th>
<th>α</th>
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Table 3. ESCI Descriptive Statistics and Correlations with Holland Efficacy.
Note: N= 292. All rs ≥ | .15 | are statistically significant (p < .01). Expanded efficacy scales’ largest Holland theme correlations are underlined.
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Table 4. Gender Comparisons for the NEO-FFI, ESCI Holland Themes, and CDSE-SF. Note: T-statistics $\leq 2.6$ are significant ($p < .01$).
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Continued

Table 5. Correlation Matrix for ESCI Basic Confidence Scales.
Note: $N = 292$. All $rs \geq .15$ are statistically significant ($p < .01$). Cronbach Alphas shown in parentheses.
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Table 6. Gender Comparisons for ESCI Basic Confidence Scales. 
Note: T-statistics $\geq 2.6$ are significant $p < .01$. 

84
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Table 7: NEO-FFI Scale Correlations with Holland and the Career Decision Efficacy. Note: N = 292. All rs ≥ | .30 | are underlined (rs ≥ | .15 | are significant, p < .01). C = Conscientiousness, A = Agreeableness, N = Neuroticism, O = Openness, and E = Extraversion.
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<td>.03</td>
<td>-.22</td>
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<td>-.05</td>
<td>-.19</td>
<td>.24</td>
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<td>-.14</td>
<td>.21</td>
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<td>-.02</td>
<td>-.34</td>
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<td>.00</td>
<td>-.13</td>
<td>.40</td>
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<td>.06</td>
<td>-.35</td>
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Table 8. NEO-FFI Scale Correlations with ESCI Basic Confidence Scales.
Note: N = 292. All $rs \geq |.30|$ are underlined ($rs \geq |.15|$ are significant, $p < .01$). C = Conscientiousness, A = Agreeableness, N = Neuroticism, O = Openness, E = Extraversion.
CHAPTER FIVE

DISCUSSION

5.1 Restatement of the Research Problem

Self-efficacy and the Big Five Factors are among the most popular personality constructs in contemporary vocational psychology, and there is substantial cumulative evidence that both play important roles in vocational interest formation, career decision-making, and job performance (e.g., Barrick et al., 2001; Lent et al., 1994; Tokar et al., 1998; Betz, 2001). Despite these advances, few studies have investigated how the two construct domains relate to one another. Elucidation of these possible connections represents an important next step toward the development of a truly unifying model of vocational behavior (cf. Osipow, 1990; Lent et al., 1994). The current research has contributed to this effort by examining relationships between the Big Five Factors and 24 different career self-efficacy domains.

More specifically, this study was driven by the thesis that the Big Five personality factors could exert two kinds of effects on career self-efficacy: (1) generalized or non-specific effects and (2) domain-specific, content-correspondence effects. For example, negative correlations between Neuroticism and a range of efficacy variables would constitute a generalized effect, while positive associations between Openness and self-
efficacy for Holland’s Artistic and Investigative themes would be a content-correspondence effect. These two classes of effects were suggested by two distinct developments in the psychological literature—the proposal of a generalized self-efficacy construct (Sherer et al., 1982) and research concerning efficacy for Holland’s (1997) occupational themes.

Support for the generalized efficacy construct comes from research demonstrating that diverse forms of career self-efficacy intercorrelate significantly and also correlate with putative measures of global self-efficacy (Betz et al., 1996; Betz et al., 1998; Betz and Klein, 1996; Lindley & Borgen, 2002). In the current study, the self-efficacy scale correlation matrices (see Chapter 4, Tables 2, 3, and 5) underscore the basic assertion that people’s self-efficacy ratings for a given domain significantly predict their efficacy ratings across a range of other, often disparate, domains.

Which, if any, of the Big Five Factors best accounts for these individual differences in generalized self-efficacy? The extant literature yields mixed evidence. Some scholars have highlighted Conscientiousness (Costa & McCrae, 1992; International Personality Item Pool, 2001) and Extraversion (Watson & Clark, 1997) as generalized efficacy variables, while others have argued that Neuroticism is essentially the negative equivalent of generalized efficacy (Judge et al., 2002). By contrast, initial studies focusing on career behavior found Openness to be the most robust positive predictor of self-efficacy (Nauta, 2004; Rottinghaus et al., 2002). Given this lack of consensus regarding general effects of the Big Five on self-efficacy, one of the goals of the present
study was to re-examine these two construct families using a more widely studied measure of the Big Five (the short form of the NEO-PI-R) and a broader range of vocational self-efficacy domains.

The current study was also intended to replicate the content-correspondence findings of Nauta (2004), Rottinghaus et al. (2002), and Schaub and Tokar (2005). Collectively, those studies used multiple measures of the Big Five (i.e., the NEO-FFI and the ACL) and produced results that were consistent with one another and also with the meta-analyses of the Big Five and Holland Interests. Therefore, those same relationships were expected from the current data set. Specifically, significant positive correlations between Extraversion and Enterprising efficacy, Extraversion and Social, Agreeableness and Social, Conscientiousness and Conventional, Openness and Artistic, and Openness and Investigative were anticipated.

5.2 The Big Five and Generalized Efficacy in the Current Study

The results of this study converge with the broader literature concerning the Five Factor Model and career behavior (e.g., Tokar et al., 1998; Barrick et al., 2001), as well as existing conceptualizations of how generalized self-efficacy maps onto the Big Five Factors (e.g., Watson & Clark, 1997; Judge et al., 2002; International Personality Item Pool, 2001). Specifically, this study supported Neuroticism as a consistent predictor of inefficacy, while Conscientiousness and Extraversion were the most robust positive predictors of career-related self-efficacy. Openness showed a less consistent but sometimes positive relationship to career efficacy, and Agreeableness showed virtually
no relationship to career efficacy. These conclusions are grounded in the NEO-PI-R scales’ correlations with three kinds of self-efficacy variables: Holland themes, expanded job-related skill themes, and career decision-making.

Conscientiousness and Neuroticism exhibited significant correlations with most of the six Holland efficacy variables (four and five, respectively), and the average size of those correlations was larger than the average for Openness. Moreover, whereas the significant Conscientiousness and Neuroticism correlations with the various Holland efficacy dimensions were of relatively uniform size, the average Openness correlation with Holland efficacy was inflated by the strong content-correspondence association with the Artistic efficacy theme. When this latter correlation is excluded, Openness displays a rather small average association with the remaining Holland efficacy themes.

Support for Conscientiousness and Neuroticism, as well as Extraversion, is even more evident when examining the Expanded Skills Confidence Inventory (ESCI). Conscientiousness correlated significantly with 12 of the 17 scales, including moderate-sized correlations with efficacy domains as diverse as Teaching and Data Management. Neuroticism showed statistically significant negative correlations with 15 of scales, again including moderate-sized correlations with seemingly unrelated domains, such as Teamwork and Mathematics. Extraversion exerted its most significant influence in interpersonal and creative domains, but a number of those correlations approached Cohen’s (1988) large effect size category. Moreover, because interpersonal skills are so heavily emphasized in the items of the ESCI (and in the contemporary workplace), Extraversion actually yielded statistically significant correlations with 12 of 17 scales.
By contrast, Openness displayed significant relationships with less than a third of the ESCI scales, and most of those associations were for skill areas that fall under the more general Investigative and Artistic Holland domains (i.e., content-correspondence effects).

The Big Five correlations with career decision self-efficacy are particularly informative, as this latter variable extends this study’s construct coverage beyond work-related skills into the more general arena of career maturity. As noted earlier, the career decision-making efficacy construct involves the ability to motivate and regulate oneself with respect to initiating career-related information-gathering, setting appropriate career decision-making goals, and effectively solving the inevitable problems encountered throughout the process. In the current sample, Conscientiousness, Extraversion (both positive predictors), and Neuroticism (negative predictor) showed moderate-approaching-large statistically significant correlations with career decision-making efficacy, while Openness and Agreeableness were neither statistically nor practically (i.e., Cohen, 1988) significant predictors of this form of efficacy. The reader will note that these trends are virtually identical to those found for the Holland and expanded efficacy dimensions.

Taken as a whole, the present results support the argument that Conscientiousness and Extraversion are fundamental predictors of career efficacy, while Neuroticism is consistently linked to inefficacious career behavior (e.g., Tokar et al., 1998). The relative superiority of these factors over Openness and Agreeableness is upheld in correlations pairing the Big Five with the Holland efficacy themes, the 17 expanded efficacy dimensions, and career decision efficacy. They also converge with arguments in the personality literature regarding the roles of Conscientiousness, Neuroticism, and
Extraversion as elements of a generalized (in)efficacy mechanism. By contrast, these results deviate from those studies that have suggested that Openness is the most robust, cross-domain predictor of career efficacy (Nauta, 2004; Rottinghaus et al., 2002).

5.3  **Content-Correspondence Effects in the Current Study**

In addition to the generalized effects of Conscientiousness, Neuroticism, and Extraversion, the current sample displayed a number of content-correspondence effects consistent with previous studies of the relationship between the Big Five and the Holland themes. The largest Conscientiousness-efficacy correlations were for scales involving organizational skills, such as Office Services, Project Management, and Data Management. Extraversion exhibited its strongest correlations with sales and public speaking efficacies, and its strongest Holland efficacy correlation was with Enterprising. Openness was most highly related to Investigative and Artistic efficacy variables, as well as tasks that require understanding and accepting people from diverse cultural backgrounds (the Cultural Sensitivity scale of the ESCI).

The only surprise involves Agreeableness. Contrary to the findings of Nauta (2004) and Rottinghaus et al. (2002), Agreeableness did not significantly correlate with self-efficacy for Holland’s Social domain or the other interpersonal helping efficacy variables. Should this finding be upheld in future research it would underscore the distinction between interests and efficacy, insofar as Agreeableness has a well-documented, positive relationship with Holland’s Social interest domain.
5.4 **Toward a Unifying Theory of Vocational Behavior**

Consideration of the Big Five as partial determinants of diverse forms of career self-efficacy may help resolve an anomaly of social-cognitive theory. Bandura (1997) has argued that self-efficacy for a given domain is primarily a result of prior life experiences in that domain (i.e., affective conditioning, verbal persuasion, performance accomplishments, and observational learning). However, this does not explain the well-documented observation that self-efficacy perceptions for seemingly unrelated behavioral domains consistently display significant, positive correlations (Betz et al., 1996; Betz et al., 1998). Nor does Bandura’s (1997) argument cohere with the present finding that diverse career self-efficacy ratings manifest consistent relationships with a few global and heritable personality traits. Rather, it seems that, regardless of behavioral domain, Neurotic individuals are more likely to experience debilitating emotions and cognitions, Extraverts tend to feel energized and upbeat, and Conscientious people believe in their self-regulatory resources. Thus, while a person’s learning history for a given class of behaviors will clearly shape efficacy expectations in that domain (à la social-cognitive theory), baseline psychological resources and tendencies are likely to moderate those effects.

In the current survey of the trait and social-cognitive literatures, a number of seemingly paradoxical findings have emerged. First, it seems clear that career outcome variables are a function of both global (traits) and contextual (domain-bound beliefs) psychological variables. Similarly, career behaviors are influenced by specific life experiences, as well as heritable psychological predispositions. Also, while career beliefs
and interests tend to be quite stable across time (trait theory), specific beliefs and interests can nevertheless be modified under certain conditions (social-cognitive theory). Finally, although a typical person will show variations in self-efficacy and outcome expectations across different career-related domains, those individual will also display continuity across those domains: For example, a person high in Neuroticism will tend to have below-average self-efficacy for the various Holland themes but will not necessarily have equally low efficacy for all six. In summary, a truly unifying theory of vocational behavior will account for these dialectics of human behavior: generality and specificity, variation and consistency, stability and change, and—or course—nature and nurture.

The likelihood of such a rapprochement between trait and social-cognitive formulations is difficult to forecast. On the one hand, social-cognitive personality theorists have been reluctant to acknowledge the influence of general, heritable factors on behavior; and they have been particularly critical of the Five-Factor Model (Funder, 2001; Bandura, 1999; Cervone, 2005). For example, Bandura (1997) argues for the conceptual superiority of domain-specific variables, because they predict domain-specific outcomes (e.g., mathematics efficacy predicting math performance) much better than global variables like generalized self-efficacy.

By contrast, Lent et al.’s (1994) Social Cognitive Career Theory is somewhat more receptive to the idea that heritable predispositions influence career behavior, though their original monograph does not directly address the impact of global personality traits. More recently, Lent et al. (2000) have explicitly suggested that dispositional affect (i.e., Neuroticism and Extraversion) may exert a significant influence on a range of career-
related social-cognitive variables. Thus, at least within vocational psychology, social-cognitive theorists are beginning to show signs of openness to the incorporation of trait constructs.

While social-cognitive psychologists seem ambivalent about global traits, trait proponents have unreservedly acknowledged the role of social-cognitive variables in shaping behavior. Indeed, the leading proponents of the Five-Factor Model have incorporated both trait and social-cognitive concepts into a recent metatheory of personality (McCrae & Costa, 1999; McCrae et al., 2000). According to this Five-Factor Theory, the Big Five Factors comprise a heritable core personality structure, which Costa and McCrae label *basic tendencies*. Citing cross-cultural, longitudinal, and behavior genetics research, McCrae et al. (2000, p. 175) assert that these basic tendencies are “endogenous dispositions, influenced not at all by the environment.” A second level of personality consists of what McCrae et al. call *characteristic adaptations*, which are described as the individual’s “culturally conditioned…skills, habits, beliefs, roles, and relationships” (p. 174). Self-efficacy expectations and other social-cognitive variables would be included among characteristic adaptations, which are conceptualized as the causal product of inherited basic tendencies (the Big Five) interacting with one’s environmental milieu and life experiences. In this framework, one’s behavior in a given situation will be co-determined by inherited basic tendencies (the Big Five) and partially learned characteristic adaptations (e.g., domain-specific efficacy).
This Five-Factor Theory (FFT; Costa & McCrae, 1999) creates new points of convergence between trait and social-cognitive formulations. Its basic tendencies/characteristic adaptations dichotomy parallels the Social Cognitive Career Theory (SCCT) distinction between general “person factors” (Lent et al., 1994, p. 105) and more contextual “sociocognitive mechanisms” (e.g., self-efficacy, p. 82). Moreover, both FFT and SCCT posit that specific cognitive structures (e.g., mathematics self-efficacy) are important aspects of personality and are a joint product of general predispositions and environmental conditioning. Given that FFT emphasizes the general person factors, while SCCT focuses on specific cognitive structures, it is possible to view them as complementary models. At the very least, as scholars continue to conduct empirical investigations similar to the present effort, SCCT proponents will need to develop some position with respect to the role of the Big Five Factors in career behavior.

5.5 **Directions for Future Research**

Researchers can build upon these findings in a number of ways, the most obvious of which is replication. The present results replicate some of the findings reported by Nauta (2004) and Rottinghaus et al. (2002), but there are also important discrepancies, most strikingly in the case of Openness to Experience. It remains to be determined whether these inconsistencies are a function of the different Five-Factor measures or some other variable, but additional studies promise to resolve this question.

Specifically, researchers could administer both the Adjective Checklist (ACL) and the NEO-FFI, along with the Skills Confidence Inventory (SCI), to compare the properties of these two Five-Factor instruments in the context of career self-efficacy.
Such research could also use structural equation modeling, incorporating both the ACL and the NEO into a latent variable model of the Big Five. Alternatively, thriftier scholars could replicate the current study using the Big Five Inventory (John & Srivastava, 1999; John, Donahue, & Kentle, 1991) or the International Personality Item Pool Big Five Factor Markers (International Personality Item Pool, 2001; Goldberg, 1999), both of which are available in the public domain. Finally, use of peer or significant other reports of the Big Five (e.g., NEO-PI-R Form R) in conjunction with self-reports of efficacy would provide an even more rigorous test of the relationships between these two construct domains.

Once there is sufficient evidence concerning the true relationship of the Big Five to career self-efficacy, researchers can begin to clarify this connection in a number of ways. Studies can incorporate measures of generalized self-efficacy (e.g., Judge et al., 2002) to test its possible role as a mediator of Big Five Factor effects on various domain-specific self-efficacies. In addition, alternative modeling techniques, such as Nauta et al.’s (2002) cross-lagged panel approach, could allow for more rigorous testing of causal relations between the Big Five and career efficacy. Finally, measures of the Big Five and environmental sources of self-efficacy (e.g., Anderson and Betz, 2001) could be administered jointly to clarify their relative contributions to the prediction of specific efficacy domains. Are these contributions independent, or do variables like Neuroticism bias peoples’ recollections of their self-efficacy related learning experiences?
There are various other possible mechanisms by which the Big Five variables affect career efficacy. Perhaps Conscientious individuals are more likely to use fact-based information in their appraisals of efficacy (e.g., “I’ve fixed things around the house before.”), while Neurotic individuals’ ratings are driven by diffuse negative attitudes (e.g., “That seems really hard.”). Is the Extravert’s tendency to experience high levels of positive affect the primary reason for his or her relatively higher self-efficacy appraisals? If asked to describe their likely approach to a discrete career-related task (e.g., set up an informational interview with a non-acquaintance), would Conscientious individuals be more likely to spontaneously produce a structured, organized set of steps as opposed to a vague or chaotic approach? In short, there is much work to be done in identifying the precise psychological processes that link global traits to domain-specific self-efficacy expectations.

5.6 Implications for Counseling

Findings from this sample underscore what has become an axiom among vocational psychologists: career behavior and personality overlap and interact to a significant extent (Borgen & Lindley, 2003). Moreover, the career-personality relationship is not limited to the prediction of vocational interest and performance. The Big Five also account for significant variance in virtually all of the numerous vocational self-efficacy variables measured in the present study. Thus, to effectively assist their clients, career counselors should have some knowledge of the core structure of personality (i.e., the Big Five), and its implications for these various aspects of career behavior.
One very practical implication concerns the benefits of personality assessment in career-related intervention. Formal assessment of the Big Five Factors in career counseling could facilitate the process in a number of respects. Both clients and counselors will likely gain greater insight into the recurrent themes of clients’ personalities, including specific strengths and problem areas. For example, when both counselor and client know that the client has a predisposition for emotional distress (Neuroticism), this might lead them to incorporate cognitive disputation into their work or perhaps a referral for formal psychotherapy. Similarly, when a client is low in Conscientiousness, focusing on the development of planning, time management, and other self-regulatory skills may be indicated. Thanks to the large body of research concerning the implications of the Big Five for various aspects of career development (e.g., Tokar et al., 1998; Barrick et al., 2001, 2003), formal assessment of these traits can suggest a number of hypotheses regarding clients’ interests and psychological resources, as well as possible risks or problems that may be encountered in the course of counseling or future career development.

Overall, a focus on the Big Five Factors would be useful for career counselors for the same reason it is useful in academic psychology—parsimony. In addition to the broad range of career-related variables already discussed, the Big Five Factors have been empirically related to a vast array of other human behavioral tendencies, ranging from alcohol consumption and grade-point average to frequency of exercise and peer-rated intelligence (Paunonen & Ashton, 2001). This wide-ranging behavioral relevance is what makes the Five-Factor Model so attractive vis-à-vis theories and assessment techniques.
that focus on narrower, domain-specific variables. A working knowledge of the Five-Factor Model and its ever-increasing empirical database, combined with a valid Five-Factor assessment of the individual client, can provide a powerful tool in case formulation, treatment planning, and ongoing intervention.

5.7 Limitations of the Study

Although it constitutes a significant extension of prior research concerning relationships among trait and social-cognitive variables, the present study has limitations. One obvious area of concern is sampling. Our convenience sample of participants included an overrepresentation of women and young adults, all of whom completed the instrument battery via computer in group sessions in the context of their education at a large Midwestern university. As suggested earlier, replication of this study with alternative instruments, populations, and analytic designs (e.g., mediator models, structural models) is needed to substantiate and clarify the results. Nevertheless, given that the psychometric properties of scales administered to this sample were generally consistent with previous research, the present results would appear to be trustworthy.

Also, given its correlational design, the present study cannot speak definitively to causal relationships among the variables studied. Nevertheless, the reader will note that, where relationships between Five Factors and self-efficacy variables have been discussed, this document has often spoken of the Big Five Factors as having an effect or influence on self-efficacy variables. This would suggest that the Big Five are causal mechanisms (independent variables) that partially determine individual differences in self-efficacy (dependent variables). That implication is not accidental.
In their discussion of causal inference, Cohen and Cohen (1983) allow for the development of tentative causal models rooted in correlational data, provided the variables under study meet certain requirements. Those three requirements are:

1. A precedes B in time (although A may be measured at the same time).
2. Some mechanism whereby this causal effect operates can be posited.
3. A change in the value of A is accompanied by a change in the average value of B (p. 80).

The current results clearly fulfill Cohen and Cohen’s third requirement. In addition, there is ample evidence in support of the first requirement. This includes the cross-cultural and behavior genetic evidence for the Big Five (McCrae et al., 2000, 2005); research demonstrating that temperament measured as early as age 3 predicts young adult personality scores (Caspi & Silva, 1995); findings suggesting universal maturational trends in Big Five scores; (McCrae et al., 1999) and extensive documentation of the long-term stability of adults’ Big Five scores (McCrae & Costa, 1984). In summary, the Big Five personality tendencies clearly emerge well before individuals are substantially aware of the various competencies associated with career-related activities.

Regarding the second criterion—the necessity of a mechanism to explain A’s causal effect on B—generalized self-efficacy seems to be the most likely mediator of Big Five (namely, Neuroticism, Conscientiousness, and Extraversion) effects on the various types of career self-efficacy measured in this study. Specifically, the existing body of evidence suggests that the same personality factors that robustly correlate with the various vocational efficacy measures are also associated with generalized self-efficacy, or in the case of Neuroticism, generalized inefficacy.
Thus, our tentative causal model is one in which substantially heritable personality dispositions result in individual differences in generalized, baseline self-efficacy, which interact with domain specific life experiences to produce corresponding domain-specific self-efficacy expectations. Further empirical work, as suggested above, would go a long way toward supporting or disconfirming the model.

5.8 **Summary and Conclusions**

This study has built on the growing interest in the relationship between personality and career behavior. Results provide support for Conscientiousness and Extraversion as having a generalized positive effect on career self-efficacy, while Neuroticism has a generalized negative effect on efficacy. Stated more precisely, measures of these Conscientiousness, Extraversion, and Neuroticism consistently correlated with measures of career-related self-efficacy that are numerous and diverse in content focus. In addition, Conscientiousness, Extraversion, and Openness to Experience show significant correlations with those vocational efficacy domains that share a common content focus. For example, Openness exhibits its largest Holland efficacy correlations with those themes that involve creativity and intellectual curiosity—Artistic and Investigative efficacy.

The overarching goal of this dissertation is to increase our understanding of the connections between heritable traits and domain-specific cognitive variables in vocational psychology. Both Five-Factor Theory (FFT; McCrae & Costa, 1999) and Social Cognitive Career Theory (SCCT; Lent et al., 1994; Betz, 2001) acknowledge the coexistence of these two levels of personality, though FFT emphasizes global traits, while
SCCT focuses on contextualized cognitions. Ideally, scholars of all theoretical stripes will continue to investigate the possibility that trait and social-cognitive construct domains are not competing models, but two interlocking components of a single personality system. By demonstrating pervasive empirical links between the Big Five and self-efficacy, this study marks another small step toward the development of a unifying theory of vocational behavior.
LIST OF REFERENCES


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APPENDIX A

THE EXPANDED SKILLS CONFIDENCE INVENTORY

Scoring keys are contained at the end of this document.

Instructions to participants: For each item below indicate your degree of confidence in your ability to accomplish each task or activity. Use the following scale to indicate your confidence:

No Confidence at all, Very Little Confidence, Moderate Confidence, Much Confidence, Complete Confidence (Note to researchers or counselors: The Likert confidence scale is scored 1-5, respectively).

1. Use a word processing program on a computer.
2. Develop and use a personal budget plan.
3. Use a spreadsheet program on a computer.
4. Understand the scientific basis of a medical breakthrough.
5. Write a book report.
6. Inspire others through your leadership.
7. Calculate the dollar savings for an item on sale.
8. Invent a new product.
9. Call people on the phone to sell them a product or service.
10. Be in charge of the arrangements for a family reunion or holiday gathering.
11. Work in homeless shelter.
12. Provide diversity training to employees.
13. Work effectively with others on a team.
14. Speak to your class reunion.
15. Edit photographs using a computer.
16. Build a dollhouse.
17. Assemble office furniture.
18. Conduct a study on the effects of new medications.
20. Identify the causes of mechanical problems.
21. Determine the number of yards of carpet needed for a room.
22. Help build a house with Habitat for Humanity.
23. Sell a product door-to-door.
24. Hang wallpaper.
25. Socialize with people from another culture.
26. Plan the workflow in a factory.
27. Collaborate with others to get a job done.
28. Give a talk in front of your fellow club/team members.
29. Learn to perform basic auto maintenance and repair.
30. Write a novel or autobiography.
31. Train employees in new procedures.
32. Conduct market research.
33. Write an interesting story.
34. Lead a scout or church group for kids.
35. Write up the results of a chemistry experiment.
36. Conduct a financial audit.
37. Explain the advantages of your product to potential buyers.
38. Make handouts for a meeting.
39. Help a group of people to cooperate better.
40. Evaluate and hire new employees.
41. Prepare a group presentation.
42. Assertively present an argument.
43. Prepare brochures and ads using a graphics program.
44. Use a personal finance software program.
45. Explain your work to a high school class.
46. Critique a scientific study.
47. Get an A on a term paper.
48. Persuade busy people to take on important volunteer tasks.
49. Solve math word problems.
50. Create a new logo for a company.
51. Keep making sales calls in the face of many rejections.
52. Be in charge of banquet arrangements for a school or club/team event.
53. Organize systems for filing information.
54. Create a budget for a company’s fiscal year.
55. Contribute ideas to your work team.
56. Tell a group about the next steps in a project.
57. Determine computing needs for an organization.
58. Review the budget for your school system.
59. Be a college professor.
60. Analyze scientific knowledge.
61. Edit a document or paper for correct grammar and punctuation.
62. Bring people with different viewpoints together to cooperate on a project.
63. Reduce a recipe that serves six people to one that serves two.
64. Develop new TV programs.
65. Persuade others to support a political candidate.
66. Make copies on both sides of a page.
67. Develop new views about gender roles.
68. Determine important business objectives.
69. Reduce or solve conflict among group members.
70. Present your approach to solving work problems to a group of your managers.
71. Design Web sites.
72. Make charts summarizing numerical data.
73. Teach on-the-job skills to new employees.
74. Keep up with new scientific discoveries.
75. Write a movie review.
76. Sell a product to a customer.
77. Calculate how long it will take to drive between two cities at 65 miles per hour.
78. Design new fashions.
79. Encourage others to donate money to a worthy cause.
80. Schedule a meeting of several friends or coworkers.
81. Understand religious differences.
82. Schedule work to meet deadlines.
83. Share work responsibilities with others.
84. Prepare successful advertisements.
85. Construct a computer database.
86. Give good examples to explain a challenging topic.
87. Take creative photographs.
88. Motivate others to follow your vision.
89. Compare the value of different-sized boxes of the same product at the grocery store.
90. Create an advertisement for a consumer product.
91. Demonstrate a product to a potential customer.
92. Write letters or reports for your supervisor.
93. Be accepting of same-sex partner relationships.
94. Improve the efficiency of a work process.
95. Learn to repair electrical wiring.
96. Read an inspirational passage at a church service or scout/club meeting.
97. Download computer software from the Internet.
98. Help a classmate with course material.
99. Write a weekly column for a newspaper.
100. Motivate others to tackle challenging assignments.
101. Operate office machines.
102. Produce movies/films.
103. Promote sales of the products of your new company.
104. Assign office tasks to a group of workers.
105. Learn more about the culture of neighbors who are immigrants.
106. Discuss unsatisfactory work with an employee or coworker.
107. Recognize the part each team member can play in completing a project.
108. Lead other people.
109. Learn a new computer program.
110. Simplify a complex explanation for beginners.
111. Teach adults.
112. Serve as a group facilitator.
113. Solve algebraic equations.
114. Come up with a medical or scientific breakthrough.
115. Fix things around the house.
116. Develop cooperative working relationships with others.
117. Share your opinions at a city council meeting.
118. Understand new medical technologies like MRI’s and CAT scans.
119. Help a child learn to read.
120. Communicate your ideas through writing.
121. Recognize cultural differences.
122. Know when to put team goals above your own personal goals.
123. Be a tour guide.
124. Set up a new personal computer.
125. Plan a multicultural holiday party.
126. Be elected to an office in an organization.
127. Keep financial records for an organization.
128. Express your ideas publicly.
129. Manage computer systems.
130. Develop a financial plan for your retirement.
131. Teach or tutor children.
132. Perform a scientific experiment.
133. Write a play or short story.
134. Run a political campaign.
135. Design novel sets for a play.
136. Work on commission, with pay based on the amount you sell.
137. Be in charge of ordering supplies for a hospital or large business.
138. Improve racial understanding.
139. Install drapery rods.
140. Act in a play.
141. Comfort a patient experiencing severe pain.
142. Do research work.
143. Talk someone out of suicide.
144. Develop a marketing plan.
145. Meet new people.
146. Express yourself artistically.
147. Recognize famous pieces of music when you hear them.
148. Solve anagrams and other word problems.
149. Play a musical instrument.
150. Study a difficult topic for several hours at a time.
151. Counsel an unhappy couple.
152. Recognize the works of a famous painter.
153. Ride a horse.
154. Help a troubled teenager.
155. Design sets for a play.
156. Run a political campaign for someone whose views you respect.
157. Repair a clock.
158. Help others to solve their problems.
159. Solve abstract puzzles.
160. Hike and camp in the wilderness.

Part II: School subjects

161. Accounting
162. Calculus
163. Public Speaking
164. Finance
165. Plant Biology
166. Algebra
167. Physics
168. Statistics
169. Carpentry
170. Art
171. Chemistry
172. Counseling Methods
173. Industrial Arts
174. Zoology
175. Astronomy
176. Agriculture

Project Management subscale

177. Maintain a schedule for jobs that must be done.
178. Change plans in midproject when necessary
179. Know when to consult others about a problem.
180. Coordinate several aspects of a project.
181. Develop a timeline to complete the project.
182. Prioritize tasks to be performed for the project.
183. Obtain and organize information from many sources.
184. Schedule and coordinate work to be completed on the project
185. Prepare a status report on the project.
186. Delegate work to the appropriate people.

Scoring Key
Using Technology – items 15, 43, 44, 57, 71, 85, 97, 109, 124, 129 #129 overlap with C
Mechanical – 16, 17, 20, 22, 24, 29, 95, 115, 139, 169 (16, 24, 29, 95, 169 with R)
Mathematics – 7, 21, 49, 63, 77, 89, 113, 162, 166, 168 (162 with I)
Science – 4, 18, 35, 46, 60, 74, 118, 132, 165, 167 (35 and 132 with I)
Creative Production – 8, 50, 64, 78, 84, 87, 90, 102, 114, 135 (no overlap)
Writing – 5, 30, 33, 47, 61, 75, 92, 99, 120, 133 (30 and 133 with A)
Helping – 154, 151, 143, 158, 141, 138, 172, 11 (all but 11 overlap with S)
Teaching – 31, 45, 59, 73, 86, 98, 110, 111, 119, 131 (111 and 131 with S)
Cultural Sensitivity – 11, 12, 25, 67, 81, 93, 105, 121, 125, 138 (138 with S)
Public Speaking – 14, 28, 42, 56, 70, 96, 117, 123, 128, 163 (128, 163 with E)
Sales – 9, 23, 37, 51, 65, 76, 79, 91, 103, 136 (no overlap)
Leadership – 6, 34, 48, 62, 88, 100, 108, 112, 126, 163 (126 and 163 with E)
Organizational Management – 19, 26, 40, 54, 68, 82, 94, 106, 126, 134 (19, 126 with E)
Data Management – 2, 3, 32, 36, 58, 72, 127, 130, 161, 164 (all but 2,3,58, 72 with C)
Office Services – 1, 10, 38, 52, 53, 66, 80, 101, 104, 137 (101 and 137 with C)
Teamwork – 13, 27, 39, 41, 55, 69, 83, 107, 116, 122 (No overlap)
Project Management – 177-186 (No overlap)

General Confidence (Holland) themes

Realistic – 16, 24, 29, 95, 153, 157, 160, 169, 173, 176

Investigative – 35, 132, 142, 148, 150, 159, 162, 171, 174, 175

Artistic – 30, 87, 133, 140, 146, 147, 149, 152, 155, 170

Social – 111, 131, 138, 141, 143, 145, 151, 154, 158, 172

Enterprising – 19, 76, 84, 108, 126, 128, 136, 144, 156, 163

APPENDIX B

THE CAREER DECISION SELF-EFFICACY SCALE—SHORT FORM

Instructions to participants: For each statement listed below, indicate your degree of confidence in your ability to accomplish each task or activity. Use the following scale to indicate your confidence:

No Confidence at all, Very Little Confidence, Moderate Confidence, Much Confidence, Complete Confidence (Note to researchers or counselors: The Likert confidence scale is scored 1-5, respectively).

1. Use the Internet to find information about occupations that interest you
2. Select one major from a list of potential majors you are considering.
3. Make a plan of your goals for the next five years.
4. Determine the steps to take if you are having academic trouble with an aspect of your chosen major.
5. Accurately assess your abilities
6. Select one occupation from a list of potential occupations you are choosing.
7. Determine the steps you need to take to successfully complete your chosen major.
8. Persistently work at your major career goal even when you get frustrated.
9. Determine what your ideal job would be.
10. Find out the employment trends for an occupation over the next ten years.

11. Choose a career that will fit your preferred lifestyle.

12. Prepare a good resume.

13. Change majors if you did not like your first choice.


15. Find out about the average yearly earnings of people in an occupation.

16. Make a career decision and then not worry about whether it was right or wrong.

17. Change occupations if you are not satisfied with the one you enter.

18. Figure out what you are and are not ready to sacrifice to achieve your career goals.

19. Talk with a person already employed in the field you are interested in.

20. Choose a major or career that will fit your interests.

21. Identify employers, firms, and institutions relevant to your career possibilities.

22. Define the type of lifestyle that you would like to live.

23. Find information about graduate and professional schools.

24. Successfully manage the job interview process.

25. Identify some reasonable major or career alternatives if you are unable to get your first choice.
APPENDIX C

DEBRIEFING STATEMENT GIVEN TO PARTICIPANTS

Dear Participant:

Thank you for participating in our study. As you have probably guessed, we are interested in studying college students’ experiences in various domains, including common feelings, habits, preferences, and beliefs. To help us learn more, you have just completed several instruments designed to tell us about these aspects of yourself. Please note that your current responses may not be true of you every day, or all the time.

We hope that this study will help us to discover some of the personality characteristics, beliefs, and other factors that help students develop and maintain high levels of confidence in their abilities to pursue various careers and programs of education. We also hope to use our discoveries to help other students like you have more satisfying careers and lives.

If you have any questions about this research you may call Dr. Nancy Betz at 292-4166 or betz.3@osu.edu. Also, if during this experiment you have felt any concerns or uncertainties about yourself that you wish to explore more thoroughly, you may want to speak with a counselor. Ohio State University offers free career counseling services,
which you can access by calling 688-3898, as well as psychological counseling services, which can be arranged by calling 292-5766.

Again thank you for assisting us in our research.