AN APPLICATION OF VOCATIONAL INTEREST AND CONFIDENCE MEASURES TO WORK-BOUND YOUTH

DISSERTATION

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ABSTRACT

In the present studies 14 self-efficacy or confidence scales with respect to basic domains of vocational activity for high school students, particularly work-bound students, were developed. The confidence scales were designed for joint use with 14 interest scales in research and career counseling. Psychometric data regarding the confidence and interest measures was gathered in a sample of 154 first-year college students and 85 high school students. In Study 1 with college students, results indicated that the confidence scales were internally consistent. Preliminary evidence for the criterion-related, convergent, and discriminant validity of the confidence scales was also provided. More specifically, gender differences and similarities were consistent with previous research. The majority of the ESCI-HS (confidence) scales also correlated most strongly with the theoretically predicted Holland theme as measured by the Skills Confidence Inventory. In Study 2 with high school students, findings showed that the majority of confidence and interest scales were internally consistent. Gender differences and similarities were found on both confidence and interest scales. Gender differences in confidence were most evident on the Social and Realistic themes. Differences and similarities between African American and Caucasian high school students were also reported, with African Americans reporting significantly higher confidence levels on Artistic, Enterprising, and Social themes. The relationships between parallel confidence and interest scales and their joint utility in counseling were also studied.
Thirteen out of the 14 confidence scales had their strongest correlation with their parallel interest scale. Finally, the relationships between confidence scales and career decision self-efficacy were studied, and qualitative information regarding the influences upon students’ educational plans was gathered. Implications for further research on the 14 confidence scales with non-college bound students are discussed.
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CHAPTER 1

INTRODUCTION

A broad movement within education and public policy has been the reexamination of the purpose and quality of the school-to-work transition for non-college bound youth, also referred to as work-bound youth (Blustein, Juntunen, & Worthington, 2000). This movement has stemmed from concern “about students’ level of preparation to enter the labor force—especially their socialization to the work world, their ability to translate their educational skills into occupational domains, and their subsequent productivity, dependability, and flexibility as workers” (Lent & Worthington, 1999, p. 291). Thus, the school-to-work (STW) transition encompasses preparation for the shift, actual movement into the work role, and initial adjustment and socialization into the new position. The actual transition may comprise a quite extensive period of time, extending from late adolescence to adulthood (Blustein, Phillips, Jobin-Davis, Finkelberg, & Roarke, 1997). In addition, the ultimate goal of this movement “has been to offer the majority of adolescents an improved opportunity to traverse the often vast distance between high school and a rapidly changing labor market” (Blustein et al., 2000, p. 435).

From 1994 through 2001, the School to Work Opportunities Act (STWOA) was created by the federal government to enhance the bridge between educational and work arenas (Lent & Worthington, 1999). This legislative act encouraged states to create
programs that provided students with educational and work learning experiences. It also intended to eradicate the idea that a four-year college degree is the only route to vocational achievement and success (Worthington & Juntunen, 1997, p. 331). The four primary components of the STWOA were the following: general program requirements, school-based learning component, work-based learning component, and connecting activities component (Worthington & Juntunen, 1997).

More specifically, the programs were designed to teach work values and skills that would enable students to become more competitive and productive in their fields of study (Lent & Worthington, 1999). Programs that effectively connected school and work environments were also expected to improve students’ motivation, grades, and exploratory behaviors (Worthington & Juntunen, 1997). Employers were encouraged to become involved by providing students with work experience in their career field. For their participation, employers would receive access to more prepared and capable workers. In addition, the STWOA mandated that career-related activities begin prior to or during seventh grade (Lent & Worthington, 1999). These career activities would facilitate the development of a “career major”; following tenth grade, academic and vocational tasks would be directly focused on the major (Worthington & Juntunen, 1997).

The STW legislation was potentially relevant to all students, regardless of their intent to continue education after high school. However, recent legislation and policy has emphasized non-college bound, or work-bound youth. These individuals do not attend a four-year college directly following high school, although they may enroll in various types of classes and training programs. “These students constitute the majority of secondary school students in the United States” (Lent & Worthington, 1999, p. 292). Herr (1999)
summarized this population succinctly. “The distinctive characteristics of employment-bound youth are their motivations or aspirations to acquire occupational skills so that they can enter the labor market immediately after completing secondary school whether or not they simultaneously enter post-secondary education on a part-time basis” (p. 361).

Although renewed interest in the STW transition has derived from concerns within education and public policy, the STW literature has historical roots in several different disciplines, including sociology, labor economics, special education, rehabilitation psychology, developmental psychology, and vocational psychology (Blustein et al., 2000). Each of these perspectives has offered unique suggestions and models for the STW transition during the past century.

Despite the abundant research concerning the STW transition, vocational psychology, and counseling psychology at large, has the unique opportunity to use theory-driven research to provide suggestions, models, and interventions for work-bound youth. This segment of the population has been profoundly neglected within counseling psychology in recent decades (Fitzgerald & Betz, 1994; Walsh & Galassi, 2002), yet the impact of the STW movement could “directly affect the vocational outcomes of potentially 75% or more of youth” in the United States (Worthington & Juntunen, 1997, p. 323). Thus, it is important to redirect our research and practice efforts toward this overlooked group.

Recently, several authors have examined the applicability of traditional career theories to the STW transition (Krumboltz & Worthington, 1999; Lent, Hackett, & Brown, 1999; Savickas, 1999; Swanson & Fouad, 1999). Traditional career development theories highlight intrapsychic factors such as abilities, interests, and values (Blustein, 1999; Worthington & Juntunen, 1997). For example, Swanson and Fouad (1999) discussed the
relevance of person-environment fit theories for non-college bound students. Savickas (1999) examined the utility of the developmental perspective for the STW transition. These theories contrast sociological and economic perspectives, which emphasize uncontrollable and broad social, environmental, and economic forces (Worthington & Juntunen, 1997).

These contributions have been met with skepticism. Hansen (1999) and Blustein (1999) argued that matching traditional career theories to the STW transition may not be appropriate. These authors contended that the social and economic climates in which these theories were developed may not be applicable to contemporary career development processes. Herr (1999) also argued that the traditional notion of career included in several career theories may not be relevant for non-college bound youth.

An area that has not been examined in relationship to work-bound youth is the emerging literature integrating vocational interests with self-efficacy. Vocational interest measures have been used extensively in career research and counseling, and self-efficacy theory has been applied to vocational behavior throughout the past twenty years (Betz, 1999). Yet “it is only more recently that the integration of vocational interests with other individual difference variables has begun to more generally characterize both the construction and interpretation of interest inventories and to be a more frequent focus of vocational research” (Betz & Borgen, 2000, p. 330). As a result, the present study explored the use of self-efficacy theory with non-college bound students.
2.1 **Historical background of the STW transition**

During the end of the nineteenth century, high schools concentrated on several fundamental areas of education: languages, math, science, history, and classics (Blustein et al., 2000). However, this approach was criticized for promoting only higher socioeconomic and college bound students, as it resulted in low retention rates among work-bound students in high school. As a consequence, high schools adopted more responsibility for preparing students for employment positions in the twentieth century (p. 437).

2.1.1 **Theoretical frameworks of the STW transition**

Vocational education, career education, and vocational guidance are three distinctive models that have provided structure for the STW transition (Blustein et al., 2000). The vocational education movement in the beginning of the twentieth century attempted to provide students with practical skills that could be used in the workforce directly after high school, in order to enhance the economic circumstances of non-college bound high school students.

However, the vocational education initiative was perceived as a “second-rate” educational track, which attracted lower ability, impoverished individuals, as well as minority racial and ethnic groups (Blustein et al., 2000, p. 437). Other critics have accused
this movement, as well as other STW initiatives, for “dumbing down the curriculum, forcing premature decisions, and of allowing schools to take over functions that belong to parents” (Hansen, 1999, p. 356).

In contrast, the career education movement was designed to incorporate career and occupational development into multiple aspects of the standard educational curriculum (Blustein et al., 2000). This movement was introduced in 1971; it stressed exploratory work experience, awareness of diverse occupations, and the development of viable work skills (Hansen, 1999, p. 355). The goal of this movement was to enable students to make informed career plans, regardless of their intent to further their education. In addition, it was developed to reduce social class distinctions between vocational and college bound tracks (Blustein et al., 2000). The career education movement thrived throughout the 1970s, yet financial resources and public attention for this movement declined rapidly in the 1980s (Hansen, 1999).

The third movement, known as vocational guidance, has emphasized the role of career counselors and scholars (Blustein et al., 2000; Osipow & Fitzgerald, 1996). This approach is rooted in an original book by Parsons (1909) that described a matching model for career guidance (as cited in Blustein et al., 2000). This framework included the following three parts: knowledge of self, knowledge of the world of work, and true reasoning to connect the two sources of knowledge (Hartung & Niles, 2000). In addition, vocational guidance emphasizes the development of the whole individual. This is especially valuable, as the STW transition has highlighted the role of students as workers and overlooked other critical elements of their development (Hansen, 1999).
2.1.2 Guidance programming

Hansen (1999) and Gysbers (1997) traced in further detail the antecedents of current guidance programs and their contributions to the STW transition. More specifically, Gysbers (1997) reviewed the changing role of counselors within the educational system. From the 1900s to the 1970s, the position orientation of guidance counselors was implemented. This perspective focused on the duties of counselors within school systems, rather than systematic guidance programming infused throughout each aspect of the curriculum. For example, counselors were responsible for making suggestions to teachers, such as the importance of connecting their students’ classroom work to occupational activities. Counselors were also responsible for arranging classes about career exploration.

By the 1920s, formal roles of guidance counselors were established (Gysbers, 1997). Counselors were expected to provide vocational, educational, and personal mentoring to all students, not only work-bound youth. The position orientation of guidance personnel continued to dominate career planning throughout the 1970s. However, in the following two decades, comprehensive, developmental guidance programming was introduced (Gysbers, 1997). Federal funding was granted to a group of educators and counselors in order to develop a framework for guidance programs.

In particular, Gysbers and Moore, in conjunction with educators and students involved with the Minnesota Career Development Curriculum (CDC), formulated a theoretical model for comprehensive career guidance during the late 1960s and early 1970s (Hansen, 1999). As a result, the Missouri Life Career Developmental System (LCDS) was implemented in numerous states; it emphasized diverse developmental tasks, roles, and environments for students ranging from kindergarten to twelfth grade. Hansen also noted
that several elements of the model guidance program were incorporated into the National Career Development Guidelines (National Occupational Information Coordinating Committee, 1989, 1997, as cited in Hansen, 1999).

The implementation of comprehensive programs in different states continued throughout the 1970s, 1980s, and 1990s (Gysbers, 1997). Numerous amendments have also been made to guidance models since their introduction in the early 1970s.

2.1.3 Federal legislative acts

Federal legislation beginning in the 1930s has also been influential in STW initiatives. The Wagner-Peyser Act of 1933, the Educational Amendments of 1974, the Job Training Partnership Act of 1982, the Carl D. Perkins Vocational Education Acts of 1984 and 1990, the School to Work Opportunities Act of 1994, and Goals 2000: Educate America Act are examples of legislative acts (Lent & Worthington, 1999; McWhirter, Rasheed, & Crothers, 2000). In addition, programs such as Job Corps during the 1960s were developed for underprivileged youth (Lent & Worthington, 1999).

2.1.4 Landmark research investigations

Savickas (1999) reviewed longitudinal research conducted in the first half of the 20th century regarding the STW transition. For example, Landy (1940) assessed which high school experiences or characteristics predicted occupational adjustment. This author suggested that courses in high school should provide students with responsibility, personal agency, and realistic work-based experience (as cited in Savickas, 1999). Landy also utilized his Ways of Behaving Scale to calculate occupational adjustment; it included items concerning occupational exploration, abilities, and interests.
Savickas (1999) also cited Lincoln’s (1937) Index of Congruence, Miller and Form’s (1951) study of life patterns, and Super’s (1954) study of career patterns. Lincoln’s (1937) Index of Congruence attempted to predict success in the completion of academic and career aspirations. It included eight scales, ranging from flexibility of plans and ability to carry through objectives to compatibility between the requirements of an occupation and the traits of an individual (p. 328, as cited in Savickas, 1999).

Miller and Form (1951) discussed various periods of work adjustment, such as the initial, trial, and retirement stages. They also created the following descriptions for individuals making the STW transition: ambitious, responsive, fulfilled, confused, frustrated, and defeated (as cited in Savickas, 1999).

Finally, the theoretical framework underlying Super’s (1954, 1957) Career Pattern Study (CPS) was that “the years after leaving high school are devoted to exploration leading to the eventual establishment of an adult career pattern” (p. 328, as cited in Savickas, 1999). The three identified substages of this exploration period were tentative, trial, and stabilizing. In addition, six different forms of vocational movement were named, including training, experimenting, stabilizing, and floundering (as cited in Savickas, 1999).

Overall, the results indicated that individuals’ vocational coping behaviors during the transition were more critical to career development than concrete successes in their initial jobs (Savickas, 1999). Coping behaviors included any actions that facilitated movement into a more congruent occupation. Findings also showed that one-third of the participants either drifted or floundered for several years following high school, although 80% of the participants were stabilized at age 25 (as cited in Savickas, 1999). Blustein et al. (2000) also
commented on Super’s longitudinal study. They stated that the CPS illustrated the critical impact of exploration, planfulness, and active participation upon the STW transition.

Savickas (1999) noted that these studies are remarkably similar to current research investigations. However, he cautioned that the participants in these studies were primarily Caucasian men and that the social and economic climates were considerably different than contemporary conditions. Thus, he suggested replication of these types of longitudinal studies in order to examine whether the results are similar with different populations and economic conditions. Also, it is important to note that the studies reviewed are only a sample of early investigations performed regarding the STW transition.

In sum, vocational education, career education, and vocational guidance form the historical background of the STW transition. Each of these movements incorporated input from divergent academic disciplines and public policies. Federal legislative acts, as well as longitudinal research studies, have also shaped the direction of vocational programming. As a result, the STW transition has many antecedents and traditions that remain influential in current efforts to reform educational programs (Blustein et al., 2000).

2.2 Renewed interest in the STW transition

Increased awareness about the STW transition is a result of several interrelated trends and problems. One major issue is the recognition that the United States has an ineffective system for preparing students for the constantly changing world of work (Blustein et al., 2000; Worthington & Juntunen, 1997). Marshall and Tucker (1992) reported that our educational preparation for students who enter the workforce directly after high school is less efficient and impartial than systems in other countries. U.S. academic achievements have also decreased relative to other first-world countries (Lent &
Furthermore, a substantial percentage of individuals age 16 to 24 lack necessary skills to enter the workforce (U.S. General Accounting Office, 1993, as cited in McWhirter, Rasheed, & Crothers, 2000).

Thus, the quality of high school education, as well as the declining skill levels of work-bound youth, have become contentious debate topics. As a result of these problems, work-bound youth often are unemployed, drift between various jobs, or struggle for advancement opportunities (Worthington & Juntunen, 1997).

Another concern about the STW transition arose from the awareness of decreasing wages among skilled and semiskilled workers in the early 1970s (Blustein et al., 2000; Stevenson, Kochanek, & Schneider, 1998). This decline in wages is most likely due to a number of changes in the labor market. First, high-level skills and abilities are a necessity for many workers in the United States in order to stay current with constantly shifting trends and technologies (Harmon, 1996). Second, automated services and inexpensive workers in other parts of the world have replaced routine production jobs that used to be performed within the United States (Harmon, 1996). Additionally, jobs in industrial, manufacturing, and agricultural areas for high school graduates, and often high school dropouts, are increasingly less accessible (Blustein et al., 2000, p. 435). Instead, the labor market currently emphasizes information and service occupations (Marshall & Tucker, 1992).

Long-term employment has also been substituted by insecure opportunities for work. “Traditionally, occupational choices were made early and entry into jobs, and the establishment of careers and occupational identities that followed them, went relatively smoothly” (Byner, 1998, p. 31). More recently, however, workers are frequently required to make several transitions into various jobs across their lifespan. Furthermore, Bynner
(1997, 1998) argued that unemployment in modern society is directly related to individuals’ lack of basic skills, such as literacy and numeracy, and educational qualifications.

Marshall and Tucker (1992) also emphasized the United States’ moral obligation to work-bound youth. The allocation of economic resources has become increasingly unequal since the 1970s, particularly between college-educated and non-college educated individuals (Blustein et al., 2000). A college diploma is increasingly necessary for occupations that provide livable wages (Solberg, Howard, Blustein, & Close, 2002). Awareness of this wide discrepancy has renewed many policy-makers and education administrators’ interests in and ethical responsibilities to non-college bound youth.

Finally, recognition that the majority of the workforce does not earn college degrees has increased awareness regarding STW initiatives. Although less than twenty-five percent of the workforce has college degrees, eighty percent of the vocational research data within counseling psychology has been collected on individuals either enrolled in or graduated from college (Fitzgerald & Betz, 1994). Other authors have also recognized that research and clinical attention to the STW transition has been scarce within counseling psychology (Walsh & Galassi, 2002; Worthington & Juntunen, 1997, p. 324). Walsh and Galassi (2002) reported that although 80% of American Psychological Association accredited counseling programs are housed within schools of education, practice and research in K-12 education has not been a priority for counseling psychology. They also noted that the number of articles related to schools in The Counseling Psychologist and The Journal of Counseling Psychology decreased between 1994 and 2000 (p. 676).
Moreover, most studies regarding career theories and interventions within counseling psychology have involved Caucasian participants coming from middle and upper socioeconomic classes. Yet “employment-bound youth are diverse in terms of their social and economic level, gender, geographic location, racial and ethnic background, and intellectual ability and physical status, although they are more likely to be from lower socioeconomic backgrounds, with fewer financial resources and college-oriented role models, and to have different aspirations and goals than do students whose primary motivation after high school graduation is to attend college” (Herr, 1999, p. 360-1). Thus, the general relevance and utility of several career theories to large segments of the population has been questioned. In sum, research on the career patterns of the majority of workers is needed.

2.3 Application of traditional career theories to the STW transition

Within the past few years, different authors have examined the utility of existing career development theories to the STW transition (Krumboltz & Worthington, 1999; Lent, Hackett, & Brown, 1999; Savickas, 1999; Swanson & Fouad, 1999). For example, Swanson and Fouad (1999) illustrated the potential contributions of person-environment fit theories to understanding the STW shift. The authors argued that Holland’s (1977) model of vocational personality types and Dawis and Lofquist’s (1984) theory of work adjustment (TWA) are particularly valuable for STW programs. The contributions of these trait theories include the following: the equal significance granted to the person and the environment, a way to easily quantify traits of the individual and the environment, a developmental perspective on vocational choice and adjustment, and concepts that can be easily understood and incorporated into other disciplines’ efforts. Overall, the person-environment fit
programming attempts to improve students’ understanding of themselves and the world of work, as well as enhance decision-making skills. Adaptive transitions result when young adults locate job settings that complement their personality characteristics, skills, and abilities (Solberg et al., 2002, p. 709).

Savickas (1999) described the relevance of the developmental perspective for the STW transition. Specifically, this author explained how developmental models attempt to increase orientation to upcoming tasks, as well as aid in coping with these tasks. He argued that the emphasis on planning and exploring is especially relevant to this population. “Youth cope better with the STW transition if as high school students they have developed awareness of the choices to be made and of the information and planning that bear on these choices” (p. 326-7). He noted that the planning and exploring components of the developmental model create and enhance awareness in the five following areas: self-knowledge, occupational information, decision making, planning, and problem solving. In addition, Savickas outlined four intervention techniques to facilitate the STW transition: career orientation, teaching, coaching, and role rehearsal.

Krumboltz and Worthington (1999) examined the applicability of the learning theory perspective to STW transitions. Krumboltz’s (1996) Learning Theory of Career Counseling (LTCC) is composed of two parts: the factors that influence career decisions and the role of counselors (Niles & Hartung, 2000). Variables that affect an individual’s career decisions range from genetics and environmental conditions to instrumental learning experiences and task approach skills. In turn, these factors influence an individual’s actions, self-observation generalizations, which are statements about one’s performance, and worldview generalizations, which are beliefs about the world of work (Niles & Hartung, 2000).
second portion of the LTCC describes the various roles of counselors, such as coach, mentor, and educator (Krumboltz & Worthington, 1999).

Krumboltz and Worthington (1999) also discussed three primary objectives for the STW transition process in the twenty-first century. One main goal is being able to expand skills and interests, instead of basing decisions only on existing traits. The second objective is preparation for constantly changing jobs, tasks, and responsibilities, rather than assuming occupations will remain stable. Finally, the authors suggest that students should become empowered to learn about different interests, skills, and occupations, instead of simply deciding upon a future career. Krumboltz and Worthington (1999) state that job club programs, study materials, simulations, and cognitive and behavioral interventions are compatible with the LTCC perspective and are especially relevant to the non-college bound population. Blustein (1999) commented that the flexibility of human behavior inherent in learning theory is potentially beneficial for this population.

The social-cognitive view of the STW transition is also reviewed (Lent et al., 1999). Social cognitive career theory (SCCT) applies Bandura’s (1977) self-efficacy theory to vocational interest development and educational and occupational choice (Niles & Hartung, 2000). SCCT (Lent, Hackett, & Brown, 1994) emphasizes self-efficacy beliefs, outcome expectations, and personal goals within the career development process. This framework also focuses on personal agency and how internal factors like self-efficacy interact with other personal and environmental factors, such as gender, ethnicity, socioeconomic status, and external barriers (McWhirter et al., 2000).

Lent et al. (1999) described the SCCT approach to the STW transition. First, SCCT views the work transition as a process that occurs throughout the lifespan, rather than as a
single event that occurs after graduation. Second, the SCCT perspective emphasizes the following six processes during elementary, middle, and high school: (1) acquisition of positive self-efficacy expectations and outcome expectations, (2) development of academic and career interests, (3) connection between interests and career-related goals, (4) translation of goals into behavior, (5) creation of academic and work skills, and (6) recognition of the supports and barriers that influence the development of self-efficacy beliefs and potential vocational options (p. 300).

The authors also described more specifically how the six themes could be incorporated at different levels within the educational system (Lent et al., 1999). For example, interventions that foster science self-efficacy expectations in girls and racial and ethnic minorities are potential applications of SCTT. Blustein (1999) remarked, “Self-efficacy beliefs may furnish work-bound youth with a critical internal structure that will help them confidently negotiate the transition from school to work” (p. 350). In conclusion, Lent et al. (1999) suggested that SCCT could serve as an integrative framework for the STW transition and emphasized the importance of interdisciplinary research and practice.

However, the contributions of these vocational theories to the STW transition have been met with uncertainty. Although these theories offer different options for programs, Hansen (1999) argued that “matching relevant models of the twentieth century alone may not be what we need for twenty-first century career development” (p. 354). In addition, Blustein (1999) contended that application of traditional vocational theories to STW programs may unintentionally result in a loss of information. Because of extensive differences in the social and economic climates in which these theories were developed and validated, their relevance to current STW transitions has been questioned.
Herr (1999) also added arguments against the use of traditional vocational theories. The notion of career implies that youth and adults have a broad range of occupational opportunities. However, many individuals have a restricted range of job options, due to social oppression, discrimination, lack of access to information, or limited support and mentoring. Again, traditional vocational theories have tended to focus on middle and upper socioeconomic classes (Fitzgerald & Betz, 1994). In addition, Herr (1999) stated that traditional vocational theories have emphasized college student populations rather than work-bound youth. Furthermore, certain career theories do not account for the interrelated components of the STW transition: preparation for work in school, transition services, and orientation and adjustment within the workplace.

2.4 Current STW programs

As stated previously, there is an abundance of literature regarding the STW transition. During the 1980s, the weaknesses of educational systems within the United States were beginning to be recognized. Policymakers and politicians acknowledged the need for new standards and programs; as a result, several task forces were formed to address the educational system’s problems (Blustein et al., 2000).

For example, in 1990 corporate leaders and educators formed the Secretary’s Commission on Achieving Necessary Skills (SCANS), which emphasized apprenticeships and transferable skills, such as the ability to reason, responsibility, and integrity (Blustein et al., 2000; Hansen, 1999, p. 355). The report outlined three fundamental academic areas: basic skills such as writing, thinking skills such as problem-solving, and personal qualities such as honesty. SCANS also delineated a set of competencies necessary for effective work performance: time management, interpersonal and leadership skills, the ability to gather and
utilize information, the capacity to understand the relationships among systems, and the use of technology (Blustein et al., 2000, p. 439; Solberg et al., 2002, p. 707). Another example of a task force was the 1983 National Commission on Excellence in Education, which eventually produced the report “A Nation at Risk”. This report implicated ineffective teaching as the reason for declining student performance and overlooked the effect of family and community members on performance (Blustein et al., 2000). It was later recognized, however, that educational standards for students were changing, rather than student performance. The 1990 Task Force on Education acknowledged the role of parties outside of school systems, such as employers (Blustein et al., 2000, p. 439).

The following six types of STW models have surfaced in recent years because of the availability of federal funding: career academies, occupational-academic cluster programs, restructured vocational education, technical preparation programs, youth apprentice programs, and within school-based enterprises (Blustein et al., 2000). For example, career academies emphasize a particular skill or industry for a small proportion of students. In contrast, occupational-academic cluster programs involve all students in basic career-related activities. Students then continue specialized “work-based learning” (p. 441). Although each program has different emphases and activities, each aims to facilitate students’ transitions to work (Blustein et al., 2000). Also, these models may vary widely between schools, but each is incorporated within the comprehensive guidance program of the school.

Another recent framework designed to aid youth is known as school-to-work-to-life (STWL; Solberg et al., 2002). The STWL model “expands recent STW programs to include an important focus on empowering youth with the basic skills and competencies necessary to compete in the world of work and the world of life” (Solberg et al., 2002, p. 706). Rather
than attempting to improve young adults’ transitions into their first employment site, the STWL framework aims to prepare youth to competently adapt to any work or life change through vocational learning activities. The STWL paradigm is guided by the developmental-contextual perspective, which is described by Walsh, Galassi, Murphy, and Park-Taylor (2002).

Walsh et al. (2002) emphasized the role of the developmental-contextualism perspective for counseling psychologists in schools. Although their article does not focus on the STW transition, the authors argued that this framework is appropriate for practice and research within school systems. The developmental-contextualism framework (Lerner, Walsh, & Howard, 1998, as cited in Walsh et al., 2002) expands upon traditional developmental models in four primary ways. This broad model (1) emphasizes the role of several contexts (e.g., family) upon development, (2) incorporates biological, psychological, and sociocultural aspects of development, (3) focuses on development in adulthood in addition to childhood, and (4) highlights the importance of strengths and deficits. In sum, the authors stated that the “four principles of developmental-contextualism provide excellent guidelines for interventions in school and community settings” (p. 695).

Thus, the STWL paradigm recognizes that positive outcomes in work and life mutually interact because of underlying basic skills and competencies (Solberg et al., 2002). A person and his or her environment also dynamically impact each other. Consequently, interventions within this perspective focus on the student and several interrelated contexts, including school, family, and community, rather than overemphasizing the “person side of the person-environment equation” (p. 710).
Two examples of STWL interventions designed for low-income urban youth are Achieving Success Identity Pathways (ASIP; Solberg, 2001) and Tools for Tomorrow (Blustein et al., 2001, as cited in Solberg et al., 2002). More specifically, ASIP is a psychoeducational program designed to help youth identify barriers in transitions, enhance connections between students, peers, and educators, and increase personal agency, or “success identity”. This intervention, which has been applied in middle schools, high schools, and universities in Milwaukee, Wisconsin, also utilizes other specific theories such as Bandura’s Social Cognitive Theory (SCT) and Deci and Ryan’s Self-Determination Theory to achieve its goals (as cited in Solberg et al., 2002, p. 714). For example, ASIP incorporates the notion from SCT that interventions must provide learning experiences that improve self-efficacy beliefs.

Tools for Tomorrow is also a psychoeducational intervention. Its goals are to “enhance self-knowledge, clarify career and educational goals, develop adult mentors, affirmatively integrate ethnic and racial identity factors, and deal effectively with family issues” (Solberg et al., 2002, p. 717). In sum, both programs aim to help students develop the necessary skills and competencies for effective STWL transitions.

2.5 Current STW research

A recent study investigated the transitions of non-college educated workers. Blustein et al. (1997) identified traits that were associated with successful transitions among 45 employed young men and women. Eighty-seven percent of the sample graduated from high school, and 42% of the participants had attempted yet not completed postsecondary education in four or two year colleges and technical programs.
In order to adequately comprehend the transition, the authors investigated both individual psychological attributes and contextual characteristics (Blustein et al., 1997). The authors gathered qualitative, interview data from the participants who had been transitioning from STW for less than ten years. Job satisfaction and occupational choice congruence were utilized to measure an adaptive transition.

Results indicated that self and environmental exploration, active engagement towards academic and vocational contexts, and a clear sense of self were among the desired attributes (Blustein et al., 1997). Other critical traits included reliance upon others when making decisions, flexible decision-making skills, opportunities for advancement in the workplace, positive interactions with guidance counselors, and supportive relationships. Educational barriers were perceived as a main impediment to life satisfaction. The authors stated, “The present findings suggest the importance of an active, dynamic, and purposeful stance on the part of all major players in the school to work transition” (p. 394). Primary players include educators, families, employers, counselors, significant others, and students. Thus, this model directly contrasts an autonomous decision making position for students.

Also, Blustein et al. (2000) summarized findings from several studies regarding the variables that contribute to a successful STW transition. The factors included the following: (1) competencies in basic and applied knowledge, (2) psychological factors such as self-initiative, flexibility, planfulness, and future orientation, (3) a supportive relational environment, and (4) a school environment that clearly links education to work.

Way and Rossmann (1996) analyzed the role of individual and family traits toward STW transition readiness among high school seniors. The construct of transition readiness was measured by two scales of career maturity, indicators of work effectiveness skills, and a
questionnaire regarding post-high school plans. Overall the indicators of transition readiness were lower than values found among first-year college students, suggesting lower levels of vocational identity and higher levels of career indecision (p. 19). Results also revealed that the following variables had direct effects on transition readiness in a path model: gender, race, two family functioning factors (proactive family functioning and inactive family functioning), and learning strategies. More specifically, Caucasians and females were more likely to report transition readiness than males and racial minorities. Proactive family functioning, versus inactive functioning, supported transition readiness. Findings also indicated that socioeconomic status’s effect on work readiness was mediated by its direct impact on family functioning and that two-parent families were positively associated with greater parent involvement in school and proactive family functioning. The authors stated, “One’s success in preparing for occupational work appears to be mediated by the family and how it functions” (p. 28).

Borman (1991, as cited in Blustein, 1995, & Blustein et al., 2000) used a qualitative approach to examine the STW transition among 25 working class youth from urban areas within the United States. Borman found that the individuals showed considerable diversity in terms of their initial work settings; however, common themes were noticed. Specifically, Borman reported that workplaces that provided challenge, independence, and access to knowledge and skill development were the most satisfying, as reported by participants. Another theme indicated that the “men in her sample were given tasks that offered greater interest, autonomy, and potentially transferable skills than the women” (p. 450, as cited in Blustein et al., 2000). As a consequence, men tended to proceed better in their jobs.
Klerman and Karoly (1995) analyzed data from the National Longitudinal Survey-Youth (NLS-Y) project (as cited in Blustein et al., 2000). The initial sample included 12,781 individuals ranging from 14 to 21 years of age. The authors found that high school graduates reported moderately stable employment patterns (e.g., “an average of six jobs in the eight years since high school with at least one of these jobs lasting three years” (Blustein et al., 2000, p. 451). Yet the authors also found that racial and ethnic minorities, women, and high school dropouts did not experience similar levels of stability. Other studies have suggested that a large percentage of work-bound students encounter unemployment and instability (Blustein et al., 2000, p. 452).

Another longitudinal investigation examined employment-bound youth between the ages of 17 and 22 during the first 18 months of their transition from vocational school to full-time work (Feij, Whitely, Peiro, & Taris, 1995). The authors utilized data from eight European countries that were part of the Work Socialization of Youth international research project. In their developmental model, an adaptive transition or outcome was defined by career-enhancing strategies and job content innovation. These two variables were perceived as “voluntary or extra-role behaviors not prescribed in role requirements established by employers” (p. 232). The authors evaluated the effect of several different factors such as intrinsic work values, extrinsic work values, and coworker relationships upon the transition. Feij et al. (1995) suggested that availability and interaction with supervisors and coworkers were particularly predictive of successful STW outcomes.

Other studies have targeted minority youth and their struggles to successfully transition from STW (Wilson, 1996, as cited in Blustein et al., 2000). Wilson utilized quantitative and qualitative methods to study the work experiences of African American,
Hispanic, and Caucasian individuals. The study indicated that discrimination, poor neighborhoods, inadequate education, and unavailable jobs hindered participants’ transitions to work. Furthermore, the findings suggested that the drastic changes in the labor market have negatively impacted the opportunities of inner-city youth.

Fouad (1995) tested the impact of a one-year intervention with eighth-grade students designed to improve math and science occupational knowledge, self-esteem, effort and achievement in math and science classes, choice of high school, and math and science course selection in high school. The intervention was targeted at racial minorities and females, who have been underrepresented in math and science college majors and careers. Results revealed weak support for increases in self-esteem and achievement in math and science classes in middle and high school and moderate support for increases in occupational knowledge. However, students in the intervention did show improvements in high school choice and high school selection of math classes. More specifically, students in the experimental group were more likely to choose a school with a specialty program in a career field and enroll in advanced math classes. The author suggested that the intervention “may have remediated low self-efficacy in math and science for girls and minority students” (p. 533)

In a study with Mexican American and Caucasian high school juniors and seniors, gender and ethnic differences in perceived barriers to career educational goals were observed (McWhirter, 1997). The results revealed that females were more likely to anticipate sex discrimination with respect to future jobs than males. Females were also more likely to report that if they did not attend college it would be due to lack of interest or the belief that it would not improve their future. The results also indicated that Mexican American students
were more likely to expect sex and ethnic discrimination in future jobs and more likely to report perceived educational barriers than Caucasians.

Another study investigated perceived influences on career expectations among freshmen and sophomore high school students (Paa & McWhirter, 2000). The authors classified perceived influences into three broad categories: background, personal, and environment. The results suggested that the three strongest background influences for both males and females were ability, role models, and media, and the three strongest personal influences for both males and females were interests, personality, and values. Females rated mother, father, and female friends as the strongest environmental influences, while males rated father, mother, and male friends as the strongest environmental influences. The results revealed that same same-sex role models were perceived as more influential than different-sex role models.

Other studies have investigated the impact of guidance programming on STW transitions. McWhirter et al. (2000) investigated the effects of a nine-week career education class on several short-term outcomes such as career decision self-efficacy, vocational skills self-efficacy, outcome expectations, perceived educational barriers, and educational plans. SCCT provided the theoretical framework for their intervention with high school sophomores. Examples of material in the career education class included assessment of personality, interests, and abilities, learning how to manage a budget, learning how to develop interview skills, writing effective resumes, learning how to explore vocational options, understanding employer expectations, and learning how to identify potential funding sources for post-secondary education.
Results indicated that the career class produced small yet significantly higher levels of career decision self-efficacy, vocational skills self-efficacy, and short-term increases in outcome expectations (McWhirter et al., 2000). The class did not affect perceived educational barriers, yet students enrolled in the first quarter of the career class were more likely to modify their career intentions. The authors suggested that “school-based interventions for secondary students can also increase career-related self-efficacy” (p. 339).

Lapan, Gysbers, & Sun (1997) evaluated the impact of comprehensive guidance programming on the experiences of high school students from 236 high schools. The authors found that students who attended schools with fully implemented guidance programs reported higher grades, more positive school environments, greater awareness of post-secondary vocational information, and greater student beliefs that their education was adequately preparing them for their future. Yet the findings also revealed that the level of guidance implementation neither positively nor negatively impacted academic accomplishment and school opinions (e.g., the quality of their education in preparing them for the future) among females, racial minorities, and lower socioeconomic students.

Blustein et al. (2000) also reviewed various aspects of successful guidance programs. The following elements were cited as critical to programs’ effectiveness: active participation in the local community, integration of career and work-based learning throughout the curriculum, early implementation of career activities, and workplace experience (p. 442-3). Finally, Baker and Taylor (1998) performed a meta-analysis of career education or STW interventions published between 1983 and 1996 and reported an unbiased effect size of .34 for the 12 studies.
It is important to note that this literature review is not exhaustive. There is a growing body of literature regarding transitions for female, racial and ethnic minority, and disabled students. However, the review provides an overview of the type and nature of studies performed regarding employment-bound youth. Furthermore, questions remain about the accurate definition of an adaptive STW transition and effective guidance programming (Blustein et al., 2000, p. 457-9). As a result, researchers from diverse educational backgrounds, such as sociology, psychology, and economics, have analyzed a wide range of outcome variables. Additionally, authors from different disciplines have suggested diverse recommendations, intervention techniques, and determinants of occupational outcomes.

2.5.1 Suggestions for future research and programming

Several authors have discussed gaps in the research literature for non-college bound youth. Blustein (1999) and Blustein et al. (2000) stated that research investigating the relationships between self-efficacy and the STW transition would be especially instructive. Strong self-efficacy beliefs about a particular skill, activity, or subject matter may enhance work-bound youth’s abilities to confidently make a transition from the world of education to the world of work.

In addition, Hansen (1999) contended that STW literature must pay more attention to how students make career decisions, as well as the influences on their decisions, such as friends, family, and the community. He also suggested that research concerning experiences such as apprenticeships, internships, part-time work, work-studies, and their relationships to various career outcomes would be informative. Additionally, he questioned whether the information provided to students in school is relevant and connected to actual experiences in the workforce.
Furthermore, different components of STW initiatives have been implemented within career guidance programs (Gysbers, 1997; Hansen, 1999). As stated previously, career guidance programs are intended to emphasize holistic development. Career counselors are required to designate at least one-third of their activities to vocational growth; the other portion is allocated to academic, personal, and social growth (American School Counselor Association, 1997, as cited in Hansen, 1999). Thus, the suggestions of policy creators, as well as counseling psychologists, could be implemented within the current frameworks of guidance programs. Gysbers (1997) wrote, “It seems to me that a logical point of entry for the work of counseling psychologists involved in school to work issues is school guidance programs” (p. 423).

In 2002, Gysbers added four avenues for counseling psychologists within K-12 education. Specifically, Gysbers wrote that counseling psychologists can help professional school counselors by (1) becoming more aware of student issues, (2) improving school counselors’ short-term guidance techniques and interventions, (3) creating more effective ways to promote organizational change, and (4) examining the results of comprehensive guidance programming upon academic achievement, mental health, and career exploration (Gysbers, 2002).

Lent, O’Brien, and Fassinger (1998) reviewed the outcomes of a conference on STW issues in 1996. Participants at the conference identified six broad areas for involvement for vocational psychologists: theory and research, marketing and dissemination, funding, assessment and evaluation, schools and communities, and professional advocacy (p. 490-2). Examples of suggestions included the following: creating new theories for STW processes, evaluating traditional career theories’ applicability to STW transitions, making vocational
psychology findings and projects available to individuals involved in STW policy, and designing and implementing interventions for students.

Worthington and Juntunen (1997) also outlined recommendations for counseling psychologists. First, they examined youth labor market issues, such as wages and employment rates. Next, the authors emphasized the necessity of an explicit theoretical foundation for this movement, such as human capital or developmental social ecology theory. The authors recognized that human capital theory has served as the foundation for the STW movement and legislation. However, the authors stated that vocational psychology theories are beginning to target social, environmental, and cultural factors, rather than solely intrapsychic traits. Because of the attention to internal and external characteristics, the authors proposed that the developmental and social cognitive theories of vocational psychology inform human capital theory.

Additionally, the authors provided specific guidelines for work on the following topics: theory development, diversity, interprofessional collaboration, differentiation of skills from abilities, transformation of vocational development efforts, practice contributions, training contributions, application of existing literature, and legislative efforts (Worthington & Juntunen, 1997). Blustein et al. (2000) also supported cooperation between different academic disciplines such as sociology, psychology, and economics.

Fouad (1997) offered a constructive list of reactions to recommendations regarding the STW movement. As an implementer of STW interventions in middle and high school, her comments are especially worth mentioning. Fouad supported a developmental orientation in STW programming, as the growth and enhancement of self-exploration, decision-making, and employability skills is necessary for adaptive transitions. She wrote
that in her experience, “Either career development skills are ignored altogether or they are inappropriate, such as encouraging student to choose a targeted career area in eighth grade” (p. 404).

Other difficulties she encountered included lack of consistent student attendance and lack of cooperation among teachers, businesses, and STW intervention leaders (Fouad, 1997). She continued that success in STW interventions is highly linked to teacher involvement and support, as well as the complete integration of vocational exploration exercises into the curriculum. Additionally, Fouad stated that the urban youth with whom she worked were less introspective and planful than the non-college bound youth investigated by Blustein et al. (1997), a study previously described. She contended that the environmental issues confronting the students, such as poverty, may have hampered their vocational self-exploration.

Finally, Fouad (1997) offered recommendations based on her experiences. Counseling psychologists need to grasp the nature of the educational system, local issues, and the role of politicians. She stated the necessity of reciprocally valuable relationships between schools and businesses; thus, it is important to help educators devise ways to provide services to businesses. Counseling psychologists need to be prepared to facilitate changes within the educational system, as well as aid in conflict resolution. She also stated that it is essential for counseling psychologists to form collaborative relationships with teachers and administrators.

2.6 Unexplored avenues with non-college bound students

The emerging literature integrating vocational interests with self-efficacy beliefs is an especially interesting, and potentially useful, area of career development (Betz, 1999).
This prominent approach to career exploration and development has been investigated with college students and adults (Donnay & Borgen, 1999; Isaacs, Borgen, Donnay, & Hansen, 1997). However, this area has not been explored with non-college bound youth. In order to describe the recent research on self-efficacy expectations and interest exploration, a brief review of self-efficacy theory is warranted.

2.6.1 Self-efficacy theory

Bandura (1977) introduced self-efficacy theory, which forms a central basis in the more current and broad social cognitive career theory (Lent et al., 1999). Bandura (1977) proposed that self-efficacy expectations are an individual’s beliefs regarding his or her ability to successfully perform the tasks or behaviors within a specific domain, such as math or science. Efficacy beliefs are important because they are hypothesized to mediate an individual’s behavior. Specifically, self-efficacy expectations are proposed to influence the following: approach versus avoidance behavior, the quality of performance behaviors within a specific domain, and persistence in the face of obstacles. For example, low self-efficacy expectations within a specific domain are proposed to lead to avoidance of behaviors within that area, poorer performance, and a tendency to resign in the face of problematic hurdles (Betz, 1999, p. 330).

In terms of vocational development, self-efficacy beliefs can act as facilitators of or barriers to career choices. For example, approach versus avoidance behaviors refer to an individual’s willingness to consider or choose a potential educational or career option. If an individual’s self-efficacy beliefs are low or weak within a specific domain, he or she may avoid a certain subject matter or activity, which would most likely cause the individual to eliminate career options within that area (Betz & Borgen, 2000). In addition, avoidance is
particularly damaging to the expansion of career interests, because it limits an individual’s exposure to potentially constructive learning experiences (Betz, 1999, p. 330). If an individual avoids certain areas because of low confidence levels, interest in those areas cannot develop.

On the other hand, if an individual has strong efficacy expectations within an area, he or she will continue to pursue activities and tasks within that domain. As a result, successful experiences would most likely enhance one’s self-efficacy beliefs. In sum, Betz (1993) has argued that moderate skills confidence levels are required for approach behavior, and thus experiential learning. Without moderate levels of confidence, it is difficult to adequately assess an individual’s capability to develop interests in an area.

Bandura (1977) also described four sources of information that influence and modify individuals’ self-efficacy expectations. The four sources of efficacy information include performance accomplishments, vicarious learning or modeling, verbal persuasion or encouragement, and levels of emotional arousal. Not only do the sources of efficacy information explain the development of an individual’s self-efficacy beliefs, but they also provide a way for counselors to modify beliefs (Betz, 1992). In some instances, counselors may design interventions to increase self-efficacy expectations within a specific behavioral domain. For example, a counselor may attempt to create a successful experience, or performance accomplishment, for a client within the feared area. Or a counselor may use anxiety management techniques, such as relaxation training, in order to decrease the physiological arousal a client experiences in conjunction with an avoided domain. See Figure 2.1 for Bandura’s self-efficacy model.
2.6.2 **Self-efficacy theory and career development literature**

Bandura’s (1977) self-efficacy theory has been applied within hundreds of studies to career-related behaviors, such as exploration and implementation. Career self-efficacy has been defined as a “general term meant to summarize the possibility that low expectations of self-efficacy with respect to some aspect of career behavior may serve as a detriment to optimal career choice and development” (Betz & Luzzo, 1996, p. 414). Examples of the application of self-efficacy theory to career development include the following: career decision self-efficacy (Luzzo, 1993), math self-efficacy and math and science interests (Luzzo, Hasper, Albert, Bibby, & Martinelli, 1999), career decision-making (Betz & Luzzo, 1996), and gender differences with regard to traditional and nontraditional occupational choices (Betz & Hackett, 1981). Additionally, Multon, Brown, and Lent (1991) performed a meta-analysis of the self-efficacy literature in which they found support for statistically significant and positive relationships between self-efficacy beliefs and academic performance and persistence across heterogeneous samples, experimental methods, and evaluation tools.

In particular, career decision self-efficacy has been an especially important concept combining self-efficacy and career development. Career decision self-efficacy refers to an individual’s confidence in his or her ability to perform the tasks involved in vocational decision-making (Taylor & Betz, 1983). Additionally, career decision self-efficacy can be considered as a career choice process variable rather than a career choice content factor; it refers to the choice and implementation of any career, instead of choices within a specific vocational domain such as math (Hackett & Betz, 1981).
Taylor and Betz (1983) described specific career decision-making behaviors that are based on the five Career Choice Competencies of Crites’ (1978) model of career maturity. The competencies are accurate self-appraisal, gathering occupational information, goal selection, making plans for the future, and problem-solving.

In the development of the career decision self-efficacy scale, Taylor and Betz (1983) found that self-efficacy expectations significantly predicted career indecision; students who reported lower levels of career decision self-efficacy were more undecided. Betz and Luzzo (1996) also documented the relevance of career decision self-efficacy to career variables such as career indecision, attitudes, and behaviors. For example, career decision self-efficacy has been shown to be a significant negative predictor of career indecision (Taylor & Popma, 1990) and a significant positive predictor of vocational exploratory behaviors (Blustein, 1989).

2.6.3 Self-efficacy expectations and interest exploration

Betz (1993) postulated that a moderate level of confidence is necessary for approach behaviors, which in turn may foster interest. According to the model combining self-efficacy expectations and interests, “neither interests nor confidence (self-efficacy) alone is sufficient to lead to a choice of a career, but rather both must be present. For example, choice of a career in science requires both interest in science and confidence in one’s abilities to learn and perform scientific activities” (Betz et al., 2003, p. 77). Thus, an evaluation of interests and confidence levels provides a more accurate vocational picture (Betz, 1993).

In some instances, lack of confidence or self-efficacy within a particular vocational area may be related to an individual’s lack of exposure or experience, rather than lack of ability (Betz & Hackett, 1981). It is difficult to accurately determine an individual’s interest
level if he or she has not had practical opportunities within a domain (Betz, 1993). In these situations, it is especially critical to enable clients to act on their interests, rather than on their fears. If the client has low self-efficacy expectations within an area, yet expresses moderate to high interest, a counselor may assist the client in enhancing confidence within that arena. As a result, the counselor has expanded the potential vocational choices for that client.

Betz (1999) encouraged the conjoint or sequential usage of several career interest and confidence (self-efficacy) inventories, as long as the measures have equivalent, or at least similar, activities or occupational domains. Examples of measures that could be used include the Strong Interest Inventory (SII; Harmon, Hansen, Borgen, & Hammer, 1994), Skills Confidence Inventory (SCI; Betz, Borgen, & Harmon, 1996), Kuder Occupational Interest Survey (KOIS; Kuder, 1966), Kuder Task Self-efficacy Scale (Lucas, Wanberg, & Zytowski, 1997), Self-Directed Search (SDS; Holland, 1994), and the Campbell Interest and Skills Survey (CISS; Campbell, Hyne, & Nilsen, 1992) (as cited in Betz, 1999, p. 332). Thus, a counselor can compare an individual’s interests in a specific area to his or her confidence within a similar domain.

2.6.4 Counseling interventions using self-efficacy and vocational interests

The joint use of self-efficacy and interest measures is particularly useful within career counseling (Betz, 1999). “Because we have means of increasing self-efficacy or confidence through interventions based on Bandura’s theory, joint use of interest and efficacy measures in career assessment and counseling can be used to identify potential career options previously avoided because of lack of confidence” (Betz et al., 2003, p. 77).

More precisely, the results of interest and self-efficacy measures can be categorized into four quadrants based on a cross-classification of interests and confidence (Betz, 1999).
The four areas are more interest and more confidence, more interest and less confidence, less interest and more confidence, and less interest and less confidence. Clients are able to clearly identify which areas or themes are high priorities for occupational exploration (more interest and more confidence), which themes are potential options if confidence can be enhanced (more interest, less confidence), and which areas may provide alternatives if interest can be increased (less interest, more confidence). Themes of low interest and low confidence will most likely be low priorities for investigation. Additionally, Holland’s (1997) model of career development can be used in conjunction with this classification system.

Also, as stated previously, counselors can successfully use this information to increase self-efficacy expectations if necessary through interventions. If a participant expresses high interest in realistic activities yet low confidence, the counselor may utilize the four sources of efficacy expectations to modify the participant’s confidence levels. Thus, the counselor is expanding the participant’s available vocational options.

2.6.5 **Research involving self-efficacy expectations and interests**

Holland’s (1997) theory of vocational development and choice states that people tend to seek work environments that match their personalities. Holland’s theory and measures attempt to match an individual’s personality type to a corresponding environment. In order to match individuals effectively, he categorized people and environments into the following six types: Realistic, Investigative, Artistic, Social, Enterprising, and Conventional (RIASEC). Holland contended that the degree of person-environment fit is linked to several important outcomes, such as persistence, satisfaction, stability, and retention (Hartung &
Niles, 2000). For example, a Social type in a Social environment would tend to be more productive, satisfied, and stable than a Social type in an incongruent environment.

In addition, Holland’s theory also postulated that the relationships among personality types and environments are hexagonal (Walsh & Betz, 1995). “Types and environments that are closest in proximity in the hexagon figure are more psychologically related. Types and environments that are further removed from one another are more psychologically different…. In this way, the hexagonal model may be used to obtain and estimate different degrees or levels of person-environment congruence” (p. 357). For example, a Social personality type would be most likely to enter and remain in a Social environment. In addition, a Social personality type in an Enterprising occupation would be more congruent than a Social personality type in a Realistic occupation. This is due to the position of the themes on the model; the Enterprising theme is adjacent to the Social theme, whereas the Realistic theme is diagonal (nonadjacent) to the Social theme. Figure 2.2 shows the Holland hexagonal model of personality and environment types (Walsh & Betz, 1995, p. 259).

In the past decade, measures of self-efficacy in relationship to the six Holland themes have been developed. One example is the Skills Confidence Inventory (SCI; Betz, Borgen, et al., 1996), which includes general confidence themes (GCT) that correspond to the Holland RIASEC types. Each GCT consists of ten tasks or school subjects, such as building a house, performing a scientific experiment, or meeting new people (Betz, 1999). The joint administration of the Strong Interest Inventory (SII; Harmon et al., 1994) and the SCI provides interest and confidence estimates for the six RIASEC themes. Specifically, six general occupational themes (GOT) from the SII and six general confidence themes (GCT) from the SCI are provided.
Using the SCI and the SII, Betz, Borgen, Kaplan, and Harmon (1998) found that the GCTs significantly predicted membership in one of the six Holland job families. Another group of authors utilized the Consulting Psychologists Press database; they reported moderate to strong correlations between interests and self-efficacy as measured by the SII and SCI scales (Chartrand, Borgen, Betz, & Donnay, 2002). Correlations ranged from the .40s (E) to the high 60s (I).

Several studies have explored the relationship between self-efficacy beliefs and interests. Betz and Hackett (1981) found that self-efficacy expectations influenced the range of perceived options and expressed interest in occupations among females. Lapan, Boggs, and Merill (1989) asked college students to rate their confidence levels with respect to occupations reflecting the RIASEC themes. The authors reported that gender differences in Realistic and Investigative interests could be partially explained by females’ lower self-efficacy levels in those two activity areas. Additionally, Lenox and Subich (1994) created self-efficacy measures with respect to the Holland themes. The authors found that both low and moderate levels of Realistic and Investigative self-efficacy may be correlated to moderate Realistic and Investigative interests, and that higher levels of self-efficacy are related to higher interest levels in those domains.

Recently, Donnay and Borgen (1999) provided evidence for the predictive validity of self-efficacy expectations. The authors used scores on the six GOTs of the SII and the six GCTs of the SCI to predict occupational type among employed adults in 21 different occupational groups. Donnay and Borgen (1999) reported that the GCTs, or self-efficacy scales, accounted for significant incremental validity beyond that accounted for by the GOTs. In percentage of variance terms in differentiating the occupational groups, GOTs
accounted for 79% of occupational differences, GCTs accounted for 82% of occupational differences, and the combined GOTs and GCTs accounted for 91% of occupational differences.

Isaacs et al. (1997) examined the extent to which self-efficacy and interests predicted college major. These authors also used the GOTs from the SII and the GCTs from the SCI. Similarly, they found that self-efficacy added to the prediction of the Holland theme of college majors beyond that accounted for by the GOTs. These studies provide evidence for the predictive utility of both interests and self-efficacy measures within the career development process (Betz & Borgen, 1999).

Tracey and Hopkins (2001) investigated the correspondence of interests and self-estimates of ability with occupational choices in a national sample of high school students. Self-estimates of ability contrast self-efficacy, as self-estimates refer to the assessment of perceived competence relative to others whereas self-efficacy reflects the measurement of competence on an absolute scale (p. 179). The findings supported the correspondence of interests and self-estimates of ability to occupational choice. Interests accounted for 27% of the variance in occupational choice and self-estimates of ability accounted for 19% of the variance in occupational choice. The authors stated that although interests were more predictive of occupational choice than self-estimates, both were uniquely related to occupational choice (p. 184).

Betz and Gwilliam (2002) examined three inventories of confidence with respect to the six Holland themes in a sample of college students: the SCI, the Self-Efficacy Questionnaire (SEQ; Lenox & Subich, 1994), and the Self-Efficacy Rating Scale (SERS;
Lapan et al., 1989). The authors investigated the measures’ psychometric characteristics and interrelationships, as well as the degree to which they produced gender and race differences.

The results indicated that men reported significantly higher levels of confidence on the SCI in the Realistic, Investigative, Enterprising, and Conventional themes (Betz & Gwilliam, 2002). The values of coefficient alpha for the SCI Holland scales were similar across racial and gender groups. The findings suggested a relative lack of race differences on the confidence measures, although African Americans reported significantly higher confidence levels on the SCI in the Artistic, Social, and Enterprising areas. In addition, the authors stated that race differences occurred only on measures that included questions regarding activities and schools rather than occupational titles (p. 298).

In a similar study, Gwilliam and Betz (2001) investigated the reliability and validity of measures of investigative and mathematics self-efficacy with Caucasian and African American college students. Results showed that the measures, such as the Investigative scale of the SCI, were adequately reliable and valid with both populations. Furthermore, findings revealed significant gender differences in math and investigative (science) self-efficacy and no significant race differences within gender. More specifically, both African American and Caucasian men reported higher levels of self-efficacy than females on the measures. The authors wrote, “Findings of gender differences related to math interests and performance occur in many racial/ethnic and cultural groups in addition to European Americans” (p. 277).

Another study examined the influence of math and science self-efficacy, interests, and gender upon the consideration of math and science careers among a sample of Black first-year college students (Post, Stewart, & Smith, 1991). Findings revealed that more
factors, such as interest and self-efficacy, influenced participants’ consideration of math and science careers than non-math and science careers. Results also indicated that males considered a wider range of career choices (both math and science and non-math and science). Furthermore, males reported higher levels of self-efficacy, interest, and consideration of math and science occupations than females. The authors stated that gender rather than race may explain why Black females are underrepresented in math and science careers (p. 184).

Studies have also investigated the impact of self-efficacy expectations, outcome expectations, interests, and perceived barriers on vocational development within the broader framework of SCCT. As stated previously, SCCT postulates that perceived self-efficacy and outcome expectations may influence the development of interests (Lent et al., 1994). For example, Feehan and Johnston (1999) reported significant positive relationships between career interests as measured by the Self-Directed Search (Holland, 1990) and self-efficacy expectations for specific vocational tasks among high school students.

In 1997, Lopez, Lent, Brown, and Gore examined SCCT models of academic interest and performance among two samples of high school math students. The researchers found substantial support for one model in which objective math ability influenced math course-specific self-efficacy, which consequently impacted outcome expectations and interest in math and science (Lopez et al., 1997). Furthermore, other sources of self-efficacy, particularly past performance, influenced math self-efficacy levels. For the second model, results indicated that objective math ability directly affected performance, as measured by math course grades, as well as indirectly through self-efficacy. The researchers stated, “self-
efficacy theory helps explain the academic behavior of high school students at a developmental point that can be key to their later career options” (p. 51).

The effect of family background and person variables upon math and science career-related decisions within the framework of SCCT was examined among undergraduate college students (Ferry, Fouad, & Smith, 2000). Results indicated that parental encouragement in math and science significantly influenced learning influences, which consisted of years and grades in math and science classes. Learning experiences in turn significantly influenced self-efficacy and outcome expectations in the path model. Furthermore, findings showed that both self-efficacy and outcome expectations directly impacted math and science interests and goals. Age and gender were found to indirectly affect self-efficacy and outcome expectations through math and science grades. The findings were consistent with the propositions of SCCT.

Another study examining SCCT propositions involved ethnically diverse middle school students (Fouad & Smith, 1996). The authors investigated the extent to which self-efficacy beliefs and outcome expectations impact individuals’ math and science interests and intentions, as well as the role of demographic variables. The findings showed that self-efficacy had a direct and indirect impact upon interests. The results also suggested that the influence of self-efficacy upon students’ intentions was largely due to the indirect influence of self-efficacy upon interest and outcome expectations. Another noteworthy finding was that the model was adequate for the three major ethnic groups in the sample, African Americans, Caucasians, and Hispanics.

Lent et al. (2001) examined SCCT hypotheses regarding the role of contextual supports and barriers within the career choice process among college students. The findings
illustrated that math self-efficacy and outcome expectations were jointly predictive of math-related interests and choice intentions. The results regarding the role of environmental supports and barriers were not expected. The authors reported that correlations of supports and barriers to intentions were small and predominantly nonsignificant. They also found that neither supports nor barriers contributed to the prediction of choice intention above and beyond the variance accounted for by interests, outcome expectations, and self-efficacy. The authors suggested that the role of contextual supports upon choice may be primarily indirect.

Other research investigations have attempted to manipulate interests by controlling self-efficacy levels. For example, Campbell and Hackett (1986) assigned subjects to a success or failure treatment condition while completing a mathematics task. Participants in the failure condition reported significantly lower self-efficacy and interest in the task; on the other hand, participants in the success group reported significantly higher levels of self-efficacy and interest. In addition, Osipow and Scheid (1971) reported that successful task experiences were associated with reported liking of a task. In sum, the empirical literature has documented the substantial role of self-efficacy within the career development process, as well as the impact of self-efficacy upon interests.

2.7 Statement of purposes

The present study incorporated the emerging literature on the effectiveness of the concurrent use of vocational interest and self-efficacy measures (Betz, 1999; Betz & Borgen, 2000). The joint use of these instruments has not been utilized as a tool with non-college bound high school students. The motivation for this study was to enhance the ability of work-bound youth to make meaningful and informed choices regarding their future
employment setting. In order to reach this fundamental goal, many smaller, yet necessary steps must be taken.

As a result, the major objective of the study was to examine the reliability and validity of self-efficacy and interest measures with respect to basic domains of vocational activity in a non-college bound sample of high school students. The study utilized two relatively new inventories, the Strong Interest Explorer (SIE; Morris, Chartrand, & Donnay, 2002), for which some psychometric quality and normative data in a high school sample are available, and the Expanded Skills Confidence Inventory-High School (ESCI-HS; Betz, Borgen, & Harmon, 2002). The latter scale is an adaptation of the Expanded Skills Confidence Inventory (Betz et al., 2003), which was normed on 1800 college students and employed adults. The ESCI-HS is a new version for which neither psychometric nor normative data are yet available.

In order to reach the major objective, research proceeded in two phases. Study 1 was conducted in autumn 2002 and involved the administration of the ESCI-HS to first-year students enrolled in introductory psychology classes at The Ohio State University. The second phase evaluated the inventories with high school students. The focus of the second study was on the psychometric properties of the measures, as well as the joint use of interest and self-efficacy measures in helping young people develop options for educational and career exploration. The second study also examined the relationship of these measures to the criterion variable of career decision self-efficacy.

More specifically, the purpose of Study 1 was to collect item analytic data for the items of the ESCI-HS. Although freshmen in college were not ideal for examining a measure designed for high school students, the study was limited to freshmen who were
eighteen or nineteen years old. Since data were collected during autumn quarter, these young adults were only a few months from their high school graduations and thus provided an adequate group for examining item-total subscale correlations. Poor items (e.g., items with low item-total scale correlations) were eliminated from the inventory. Thus, the data ensured some preliminary evidence for item quality of the ESCI-HS, which was subsequently administered to high school students. A second purpose of Study 1 was to examine the criterion-related, convergent, and discriminant validity of the ESCI-HS.

For Study 2 with high school students there were several purposes. The first purpose was to evaluate the psychometric properties of the confidence and interest measures. The second purpose was to examine differences in confidence and interest levels for different groups (e.g., gender) in order to assess the scales’ criterion-related validity. The third purpose was to examine the relationships between confidence and interest with respect to parallel domains of basic vocational activity. It was predicted that the strongest correlations would exist between parallel confidence and interest scales, as the ESCI-HS was designed for joint use with the SIE. Next, the extent to which joint use of these inventories yields domains with potential for career exploration, as indicated by patterns of high interest/high confidence or high interest but lower confidence, was analyzed. In addition, it was postulated that students who possessed more areas of possible exploration, as indicated by high confidence and high interest patterns, would be more confident about their career decision-making skills. Fifth, the relationship of several ESCI-HS confidence scales to the Career Decision Self-efficacy Scale (CDMSE) was studied. The sixth purpose was to collect qualitative data regarding the factors that have influenced students’ educational plans.
Finally, in order to “give back” to the school system and its students, a career intervention for students was offered. This intervention utilized the information yielded by the study to generate career options for individual students, as well as to suggest additional learning possibilities, such as increasing self-efficacy with respect to vocational domains for which there is some interest but low confidence. Scores on the Strong Interest Explorer (SIE; Morris et al., 2002) and Expanded Skills Confidence Inventory-High School (Betz et al., 2002) were provided in a written format.
Figure 2.1: Bandura’s self-efficacy model
Figure 2.2: Holland’s hexagonal model of personality and environment types
CHAPTER 3
METHODOLOGY

3.1 Study 1

3.1.1 Participants and Procedures

Participants included 158 students enrolled in an introductory psychology course at The Ohio State University. Students enrolled in the experiment through the Research Experience Program (REP) website. Students registered on the website, which described the location, time, and general nature of the study. The script for the REP (Psychology 100 website) is shown as Appendix A. Participation in the study was voluntary, yet each student received course credit for his or her participation in research. Prior to the administration of the measures, students were read a script describing the nature of the study (see Appendix B).

Following their participation, students immediately received a written description about the study (Appendix C), which included a list of counseling referrals and the name and phone number of the primary investigator.

One hundred and fifty-eight students participated in Study 1, although four participants were excluded from the results because their reported year in school was either sophomore or junior. Thus the sample included 154 first-year students, 38 men, 114 women, and 2 unknown, who ranged in age from 16 to 19 years ($M = 18.14$, $SD = .47$). The ethnic
distribution of the sample was 78.6% Caucasian, 7.1% African American, 6.5% Asian American, 2.6% Multiracial, 3.2% Other (or did not indicate their ethnic status), 1.3% Latino/Hispanic, and .6% Native American.

3.1.2 Measures

3.1.2.1 Confidence

The Expanded Skills Confidence Inventory-High School (ESCI-HS; Betz et al., 2002), adapted by the authors of the original Expanded Skills Confidence Inventory (ESCI; Betz et al., 2003), was utilized in the present study. The ESCI was developed to measure self-efficacy or confidence with respect to 17 basic dimensions of vocational activity; these confidence dimensions are named Basic Confidence Scales. More specifically, the ESCI was designed to be used jointly with the Basic Interest Scales on the Strong Interest Inventory (SII; Harmon et al., 1994). These Basic Interest Scales can be viewed as subareas of the six General Occupational Themes, or Holland personality and environment types. The Basic Interest Scales focus on specific, rather than general, activities.

Although the current (1994) version of the SII contains 25 Basic Interest Scales, confidence scales for the ESCI were created for many but not all of the Basic Interest Scales. Decisions regarding which Basic Confidence Scales to develop were based on the utility of the skill or interest area across a range of vocational fields, as well as to account for changes in the labor market. Examples of Basic Confidence Scales include Mechanical, Using Technology, Mathematics, Sales, and Teaching.

The seventeen scales of the ESCI (Betz et al., 2003) were developed and normed in five samples, totaling approximately 1800 college students and employed adults. Evidence for the reliability and validity of the scales is available in Betz et al. (2003) and
Rottinghaus, Betz, and Borgen (2002). For example, coefficient alpha values for the final scales ranged from .80 to .94 (adults) and .84 to .94 (college students). Evidence for scale validity was provided by discriminant analyses of scores across the eight largest occupational groups used in the adult sample (Rottinghaus et al., 2002). Rottinghaus et al. (2002) also showed that the combination of interest and confidence scores predicted college major choice and occupational preferences significantly better than either interest or confidence alone.

The ESCI was revised for high school students in two major ways. First, the scales were changed to provide confidence dimensions that parallel the scales on an interest measure for high school students, in this case the SIE (Morris et al., 2002). The original ESCI was designed for use in organizational career development and included scales such as Teamwork and Project Management. The ESCI-HS, on the other hand, is designed to facilitate the initial career exploration of high school students, including those individuals who are not college-oriented. Thus, more basic dimensions such as Outdoor/Physical and Nature/Agriculture, which could lead to choices in the protective services (e.g., police, military) and outdoor environment (e.g., landscaping), were added.

Second, item content was reviewed for appropriateness with high school students, including lower socioeconomic status and minority individuals. This step was necessary in order to establish the new measure’s content validity, which is the degree to which the items on a measure generalize to the intended domain (Walsh & Betz, 1995, p. 59). For example, the item “Pass a calculus course” was replaced by the item “Calculate a shooting percentage in basketball”, and instead of “Be a college professor”, the items “Coach a kids’ sports team” and “Be a mentor in a Big Brothers / Big Sisters program” were added.
The ESCI-HS contained 14 scales and 156 preliminary items for use in Study 1. As stated previously, the scales were designed to parallel the Basic Interest Scales of the SIE. Respondents are asked to indicate their degree of confidence in their ability to perform an activity, task, or school subject. Responses are obtained on a 5-point scale ranging from *No Confidence at All* (1) to *Complete Confidence* (5).

3.1.2.2 **Confidence for Holland themes**

The Skills Confidence Inventory (SCI; Betz, Borgen, et al., 1996) is a 60-item scale consisting of 10 items for each of the six GCTs (see Appendix D). As stated previously, the GCTs are analogous to the six GOTs on the SII. The items reflect activities, tasks, or school subjects related to each GCT. This measure was administered in order to determine the correlations of the ESCI-HS items and scales to the six Holland themes.

Participants are asked to indicate their degree of confidence in their ability to complete each task or successfully complete a school course. Responses are obtained on a 5-point scale ranging from *No Confidence at All* (1) to *Complete Confidence* (5). For each GCT, the responses to the ten items reflecting that theme are summed and an average is computed with final scores ranging from 1-5. Higher scores indicate more confidence in one’s ability within a theme. Because each scale measures a theoretically distinct construct, no full-scale score is generated. Examples of activities and school subjects are the following: Build a doll house, Industrial Arts (Realistic); Perform a scientific experiment, Calculus (Investigative); Design sets for a play, Art (Artistic); Meet new people, Counseling Methods (Social); Sell a product to a customer, Public Speaking (Enterprising); and Organize systems for filing information, Accounting (Conventional).
Betz, Harmon, and Borgen (1996) reported alpha coefficients for the six scales ranging from .84 (Enterprising confidence) for students and working adults to .87 and .88 (Realistic confidence) for students and employed adults, respectively. Parsons and Betz (1998) documented 3-week test-retest reliability coefficients for college students ranging from .83 (Realistic confidence) to .87 (Social confidence). Donnay and Borgen (1999) provided evidence for the predictive validity of the GCTs. They reported that the GCTs provided significant incremental validity when used with Holland interest measures to predict occupational group membership.

3.1.2.3 **Demographic questionnaire**

A brief questionnaire requesting age, gender, class standing, and ethnicity was included.

3.1.3 **Analysis of Data**

Means, standard deviations, gender comparisons, and item-total subscale correlations were calculated for each item. This information was used in the construction of the final scales. For each scale the eight best items were selected. Internal consistency reliability alphas were calculated for each new 8-item scale. The final inventory consisted of 112 items.

A multivariate analysis of variance (MANOVA) was performed to examine gender differences for the final scales. Means, standard deviations, \( F \) values, and effect sizes were assessed for each scale. This allowed the researchers to assess one aspect of the scale’s concurrent validity, which is the ability of a survey to distinguish between two groups of people whose behavior at the same point in time differs (Betz, Borgen, et al., 1996, p. 11). Concurrent validity is a form of criterion-related validity (Walsh & Betz, 1995). Prior
research on RIASEC themes has demonstrated consistent gender differences between the themes (Betz, Borgen, et al., 1996). It was predicted that gender differences would exist in self-efficacy; more precisely, it was expected that men would report higher levels of confidence in the Realistic, Investigative, Enterprising, and Conventional areas and that women would report higher levels of confidence in the Social area (Betz, Borgen, et al., 1996, p. 12-14; Betz & Gwilliam, 2002).

Bivariate correlations between the fourteen ESCI-HS scales and the six Holland themes on the SCI were also performed. These analyses allowed the authors to examine evidence for convergent and discriminant validity. Convergent validity is known as the association between a measure and an independent index of the same characteristic (Walsh & Betz, 1995, p. 69). It was postulated that the strongest correlations would exist between Holland domains as measured by the ESCI-HS and analogous General Confidence (Holland) Themes on the SCI. For example, it was predicted that the Realistic scales on the ESCI-HS would have statistically significant correlations with the Realistic scale on the SCI. It was also expected that statistically significant correlations would be found between scales on the ESCI-HS and adjacent themes on the Holland hexagonal RIASEC model. For example, Realistic scales on the ESCI-HS were expected to have stronger correlations with the Investigative scale than the Social scale on the SCI.

In contrast, discriminant validity is the extent to which a measure is not associated with theoretically distinct measures or variables (Walsh & Betz, 1995, p. 69). Thus, it was expected that weak correlations would exist between self-efficacy scales on the ESCI-HS and SCI in areas that are diagonal from each other on the Holland hexagonal model. For example, a Conventional scale on the ESCI-HS was expected to have a weak correlation
with the Artistic Scale on the SCI, as these domains are diagonal from each other on Holland’s model.

Finally, bivariate correlations among the 14 ESCI-HS scales were performed. It was expected that the strongest correlations would be found between scales of the same Holland theme. For example, it was postulated that the Mathematics scale and Science scale would be strongly correlated with each other, as they are both classified as Holland Investigative scales. In addition, it was expected that the fourteen scales would have weak correlations with scales that were theoretically distinct, such as the Mathematics scale with the Cultural Sensitivity scale (a Holland Social scale).

3.2 Study 2

3.2.1 Participants and Procedures

The investigator contacted the appropriate administrators during the summer months of 2002 in order to conduct research within a public school system. Specifically, the investigator contacted the research office for the school district and the Director of the OSU Office of Outreach and Engagement. The investigator discussed with administrators the necessary steps in order to utilize the high school student population.

Once approval was granted from the district’s Research Proposal Review Committee, the investigator contacted several principles within the district. The investigator discussed the research project with administrators of the schools throughout the winter and spring months of 2003. She entered a public high school and career center in March 2003 and May 2003, respectively.

The school district is composed of approximately 64,000 students and 145 schools. The district is currently in a state of “academic emergency”, which means that the district
has met less than seven of the twenty-two state performance standards. The ratings are based on 4th, 6th, 9th, and 10th grade proficiency scores, attendance, and graduation rates. For example, the graduation rate in 2002 for the district was 56%. Districts in “academic emergency” are required to develop a three-year continuous improvement plan and submit it for approval to the state Department of Education.

The district has implemented an internship program for high schools, which includes career planning activities and experiences. Beginning in 9th grade, students complete an Individualized Career Plan (ICP) in which they target potential careers. Examples of career clusters include science, arts, clerical, communication, and technology. Students may revise their ICP each following year. Graduating students are required to meet the internship requirement which includes a 9th grade career exploration and preparation class, a 10th grade community service project, and work site experience during the junior and senior years. The community service requirement may be met by volunteering at settings such as hospitals or churches or by participating in classroom activities that benefit community organizations. The work site internship may be paid or unpaid, yet it is a formal supervised field experience. In addition, a portion of the work site experience must be within the student’s career area, as indicated in his or her ICP (personal communication, March 20th, 2003).

Junior and senior students within the district also have the opportunity to apply to career centers within the district. The four career centers offer one and two-year programs such as Banking and Accounting, Cosmetology, Professional Foods, Kroger Career Academy, Auto Technician, Fire Service/First Responder Program, Animal Technician, Food Management, Welding and Cutting, Internet Publishing, Commercial Art, and Fashion and Fabrics. Students who enroll in these programs spend half of each day at their high
school and the remaining half at their designated career center. Thus, they have the opportunity to graduate with their high school diploma and a particular skill. It is also possible for students to receive training in a specific area yet not receive their diploma.

The participating high school was chosen because of the large percentage of students who are work-bound. The high school is composed of approximately 850 students and has an above district average graduation rate (personal communication, February 25th, 2003). According to guidance personnel within the school, approximately 30-35% of students apply to a four-year college, although a smaller proportion of those students reportedly obtain a four-year degree. The remaining percentage of students reportedly apply to two-year programs, specialized or apprenticeship training programs, or directly enter the workforce. This latter group may be classified as non-college bound. The 2002 average GPA for the school was 2.3, and the drop out rate was approximately 20-25%, although that figure contains students who transfer to other schools within the district (personal communication, February 25th, 2003). In addition, approximately 25% of the juniors and seniors at the high school attend a career center, although approximately 10% drop out before the end of the school year (personal communication, March 26th, 2003).

Another program administrator within the district provided similar statistics regarding applications to two-year and four-year programs at that high school. However, the administrator reported that their program statistics provide a general rather than exact representation of post-high school educational plans. In 2002 72 out of 173 graduates (42%) applied to a four-year college, while 12 students (7%) applied to a two-year college. The remaining 51% did not reportedly complete applications for additional education during the
school year. Furthermore, the students who did not graduate could be considered work-bound (personal communication, May 30, 2003).

The career center was also chosen for data collection because of availability and the ability to examine responses of those involved in specialized training. Because data were collected in the spring, these students had completed either one or two years of training in their programs. Examples of programs offered at this center included Cosmetology, Professional Foods, Environmental Services, Merchandise Distribution, Animal Management Technician, and Criminal Justice Program.

It was requested that written consent from parents be waived for Study 2. Because of the older age of the participants (juniors and seniors in high school), it was sufficient to send a letter to parents of students describing the general nature of the study (see Appendix E). In addition, the measures in the study were intended to aid students with career development and may have been similar to previous career guidance activities in elementary or high school. This letter was given to participating students to take home to their parents in spring 2003.

Students who were present on the day of testing administration in March and May 2003 were included in the study. The administration period at both settings was determined by the schools’ schedules. At the high school, students completed the measures during an open period at tables in the auditorium. At the career center, students completed the measures at tables in a conference room. The measures required approximately forty-five minutes to complete.

A written script was read at the beginning of the testing administration (see Appendix F). Completion and submission of the measures implied consent. Thus, a waiver
of written consent/assent for the high school students was also requested for the study, as students were of sufficient age and maturity to make their own decisions about participation.

In addition, participating students were included in a raffle for thirty and ten dollar gift certificates. It was hoped that these incentives would encourage students to actively participate in the data collection process. Students had the option to withdraw during the course of the testing administration and remain in the raffle drawing, yet none of the students withdrew during the testing period.

Following completion of the measures, a handout was provided reiterating the nature of the study (see Appendix G). The name and phone number of the primary investigator was included on the handout if students had questions or wanted counseling referrals.

An a priori power analysis was conducted in order to determine the number of participants needed to detect a medium effect size ($r = .30$) at an alpha level of .05. The results indicated that 88 participants were needed to detect a correlation of .30 at a power level of .90 (Faul & Erdfelder, 1992). According to Keppel (1991), a power level of approximately .80 “represents a reasonable and realistic value for research in the behavioral sciences” (p. 75).

As a result, participants were 85 high school students within the district. Sixty of the participants were tested at the public high school and 25 participants were tested at the career center. Yet a small percentage of students (13%) tested at the public high school were currently enrolled at a career center, as they transfer from their high school to their designated career center during the day. Thus, the sample consisted of 33 students enrolled in a career center within the district.
The total sample included 52 juniors, 32 seniors, and 1 unknown, who ranged in age from 15 to 19 years (M = 17.08, SD = .81). Thirty-four of the participants were male and 51 were female. The ethnic distribution of the sample was 70.6% African American, 24.7% Caucasian, and 4.8% Biracial. The ethnic distribution of the sample is fairly representative of the ethnic distribution of the district, which is 62% African American, 33% Caucasian, 3% Hispanic, and 2% Asian (personal communication, May 29, 2003).

Sixty-six percent of the participants in the sample reported that they are currently working for pay. This is consistent with other statistics that estimate approximately 64% of high school juniors and 73% of high school seniors work for pay at least one week during the academic school year (Pergamit, 1995, as cited in Stone & Mortimer, 1998). When asked about grades in high school, 10.6% responded mostly As, 38.8% responded mostly Bs, 32.9% responded mostly Cs, 1.2% responded mostly Ds, and 16.6% responded a combination of different grades.

The demographic questionnaire also asked students to indicate the highest level of education achieved by their mother and father. The following percentages were reported by students for their mothers: 10.6% some high school, 32.9% finished high school, 3.6% finished trade school, 30.7% finished high school and some trade school or some college, 12.9% finished college, 5.9% finished a graduate degree, and 3.5% unsure or does not apply. The following percentages were reported by students for their fathers: 10.6% some high school, 38.8% finished high school, 18.8% finished high school and some college, 7.1% finished college, 5.9% finished a graduate degree, and 18.9% unsure or does not apply.

Students were asked to identify what additional type of education, if any, they expected to complete. The sample endorsed the following educational plans: 5.9% no plans;
21.3% completion of 2-year community college programs, specialized training for less than two years, advanced training through the military, or apprenticeship (e.g., a program in plumbing); 3.6% completion of 2-year community college and 4-year bachelor’s degree programs; 37.7% completion of 4-year bachelor’s degree program; 10.7% completion of a master’s degree; 18.9% completion of a professional graduate degree; 2.4% other. Because students endorsed a wide variety of combinations for educational plans, 2-year community college programs, specialized training, advanced training through the military, and apprenticeship were combined. In addition, some students reported plans such as finishing a 2-year degree and a professional degree. In those circumstances, they were included in the category with the highest educational goal, such as receiving a professional degree.

Based on students’ responses, 27.2% of the sample was considered work-bound, 70.9% was considered college bound, and 2.4% was considered other. As stated previously, work-bound students are individuals who do not attend four-year colleges directly following high school, although they may enroll in various types of classes and training programs.

The educational plans reported by students were unanticipated based on personal information gathered regarding the district and high school. In addition, these plans are incongruent with national statistics. “In 2000, only 57% of Latinos and 78% of African American students were high school graduates, compared to 88% of Euro/Slavic Americans (U.S. Census Bureau, 2000). Similarly, African American and Latino students are greatly underrepresented in four-year college campuses. At present, whereas 26% of Euro/Slavic Americans have completed four years of college, only 15% of Blacks and 9% of Latinos have completed four years of college” (U.S. Census Bureau, 2002, as cited in Solberg et al.,
Thus, the present sample’s intent to complete a four-year college was substantially higher than national averages.

Based on the national and high school’s statistics, the investigators decided to include all of the high school students’ responses in order to gather psychometric data regarding the measures. In addition, although a large majority of the students indicated educational plans involving four-year colleges, it is uncertain whether all of the students will complete their degrees. Furthermore, the authors decided to compare the responses of those endorsing college bound plans to those individuals expressing work-bound paths to further examine the concurrent validity of the confidence measure.

The educational plans of students involved in career centers versus students who remain at their high school for the entire day are noteworthy. Students who remain at their high school for the entire day will hereafter be referred to as “traditional” students. Although 52% of career center students (17 students) endorsed work-bound plans (e.g., no future educational plans, two-year community programs, specialized training, advanced training through the military, or apprenticeship), only 12% of the traditional students (6 students) indicated work-bound plans. While 48% of students at the career center (16 students) endorsed plans to complete a four-year college, master’s, or professional graduate degree, 85% of traditional students (44 students) indicated bachelor degree and post-bachelor degree plans.

The investigator returned to the school system three weeks following the administration of the measures. It was originally proposed that the investigator meet with each student individually to discuss his or her results. After a discussion with school administrators, it was decided that written results of each student’s responses would be
provided. Students could choose to contact the primary investigator regarding their results, as contact information was listed on the debriefing sheet.

The written results were based on the confidence and interest responses of each individual. The following areas were identified: high priorities for occupational exploration (more interest, more confidence), potential options if confidence could be enhanced (more interest, less confidence), possible alternatives if interest could be increased (less interest, more confidence), and low priorities for investigation (low interest, low confidence).

The classification system for the intervention was conservative due to the new nature of the inventories. The intervention was designed to expand rather than constrict students’ options. High confidence was classified as values greater than or equal to 3.4 and low confidence was classified as values less than or equal to 2.7. High interest was classified as greater than or equal to the 66th percentile value for each interest scale. For many scales, high interest was values greater than or equal to 2.3. Low interest was classified as less than or equal to 1.5.

Each student received an explanation of the four quadrants, career areas that fell within the quadrants based on their responses, descriptions of the career areas and potential training programs, occupations, and activities within the areas, and a list of websites designed to aid career exploration. The quadrants are based on guidelines within the SCI manual (Betz, Borgen, et al., 1996), and the career areas and descriptions were taken from the SIE (SIE; Morris et al., 2002), although additional occupations were added in order to expand options.

Because the investigators individually prepared the written packets, cutoff values were adjusted, when necessary, in order for each student to have career areas listed as high
priorities for occupational exploration (more confidence, more interest). In addition, certain students identified more than seven career areas as high priorities for occupational exploration. In those instances, students were provided with six areas as high priorities for occupational exploration based on their highest interest levels.

3.2.2 Measures

3.2.2.1 Confidence

The revised form of the ESCI-HS was utilized. The final scale is shown as Appendix H. The scales and sample items are shown in Table 3.1.

3.2.2.2 Vocational interests

The Strong Interest Explorer (SIE; Morris et al., 2002) consists of 140 items. The SIE is created for early career exploration and is intended to provide younger (e.g., high school or community college) students with an estimate of their interests relative to basic dimensions of vocational activity (Morris et al., 2002, p. 6). It also provides students with a way to link interests to occupational and educational information. The authors state that the usefulness of the instrument is dependent upon the motivation and reading ability of the individual (Morris et al., 2002).

The SIE is an ipsative measure in which an individual compares his or her own interests across 14 Basic Interest Scales. Examples of the Basic Interest Scales include Helping Others, Health and Science, Law and Politics, Working with Computers, and Working with Numbers. The authors emphasize that the scales measure participants’ interests, rather than their abilities or aptitudes (Morris et al., 2002). The scales and sample items are shown in Table 3.2.
The SIE instructs participants to place checkmarks next to items they like, and skip items that they do not enjoy. Students are then instructed to calculate the scores for each scale by summing the number of checked items within each of the 14 basic scales. If an individual expresses interest in an area (as indicated by marking items “Like”), he or she is encouraged to learn more about that interest area (Morris et al., 2002).

Because the purpose of the present study was not for students to independently compare their own interests across the 14 Basic Interest Scales, the response options of the SIE were altered. In Study 2, students were provided with the same directions as on the original SIE. However, participants were asked to respond on a 3-level Likert-type interest continuum. The response options included Dislike (1), Not sure (2), and Like (3). For each scale, an average of the responses to the ten items was computed and final scores ranged from 1-3. Higher scores are indicative of higher levels of interest.

Initial reliability and validity data were reported by Morris et al. (2002). Internal consistency reliability alphas ranging from .80 to .91 were reported for all of the Basic Interest Scales with a sample of high school students. Test-retest reliability coefficients ranging from .70 to .87 were reported with a sample of employed adults (Morris et al., 2002). In addition, evidence for the construct validity of the SIE has been provided. Employed adults’ self-expressed interests in a wide range of areas correlated with their SIE Basic Interest Scale scores (Morris et al., 2002, p. 11). Also, individuals typically reported higher interest in the SIE domain in which they were currently working (Morris et al., 2002).

3.2.2.3 Career self-efficacy

This construct was measured by the short form of the Career Decision Self-efficacy Scale (CDMSE; Betz & Taylor, 1983). Both long and short versions of this scale are based
on Bandura’s (1977) concept of self-efficacy expectations and Crites’s (1978) model of career maturity. Scale construction originally centered upon the five Career Choice Competencies in Crites’s model: accurate self-appraisal, gathering occupational information, goal selection, making plans for the future, and problem solving. The CDMSE scale assesses an individual’s level of confidence that he or she can successfully complete career decision-making tasks.

The CDMSE short form (CDMSE-SF) consists of five 5-item subscales, a total of 25 items. The five subscales are the different competencies previously listed in Crites’s model of career maturity. Participants respond on a 5-level Likert-type confidence continuum, ranging from No confidence at all (1) to Complete confidence (5). Each subscale score is the total of the five items within that subscale; the total score is obtained by summing the five subscale scores. Higher scores are indicative of higher levels of career decision self-efficacy. Examples of items are “Find information in the library about occupations you are interested in”, “Make a plan of your goals for the next five years”, “Accurately assess your abilities”, and “Change majors if you did not like your first choice”. Table 3.3 depicts the five scales and sample items. The entire scale is shown as Appendix I.

Betz, Klein, and Taylor (1996) reported internal consistency reliability coefficients ranging from .73 (self-appraisal) to .83 (goal selection) for the five-item subscales. The reliability of the 25-item total score was .94. Luzzo (1993) reported a six-week test-retest coefficient of .83 for the total score in a sample of community college students. Evidence for construct validity was inferred from the expected relationships between the CDMSE-SF and career indecision and vocational identity (Betz & Luzzo, 1996). Betz and Serling (1995) also found a negative relationship between CDMSE scores and fear of commitment, and
Blustein (1989) reported a predicted positive association between CDMSE scores and career exploratory behaviors. Recent research has suggested that the scale be used as a general measure of decision-making self-efficacy due to a lack of support for the five theorized factors (Creed, Patton, & Watson, 2002).

3.2.2.4 Demographic questionnaire

A demographic questionnaire requested the following information: name, age, gender, year in school, race/ethnicity, educational plans, parental educational level, career expectations, current work, and influences upon educational plans (Appendix J). The format for educational plans, parental educational level, and career expectations was consistent with previous research (McWhirter et al., 2000).

Participants’ names were required in order to identify responses for the career intervention. Their names were not utilized for any other purpose. The confidentiality of the students’ responses was emphasized in the written handout provided to students following completion of the measures.

3.2.3 Analysis of Data

First, the psychometric properties of the ESCI-HS (Betz et al., 2002) and the SIE (Morris et al., 2002) were examined. Means, standard deviations, and score distributions were calculated for each item on the ESCI-HS due to the new nature of the inventory. Item-scale total correlations were also calculated for each item. Next, means, standard deviations, and internal consistency coefficient alphas were calculated for the individual scales of the ESCI-HS and SIE. An internal consistency coefficient alpha was also calculated for the CDMSE scale.
Second, bivariate correlations among the 14 scales of the ESCI-HS were examined. It was expected that the strongest correlations would be found between scales of the same Holland theme. For example, it was postulated that the Mathematics scale and Science scale on the ESCI-HS would be most strongly correlated with each other, as they are both classified as Holland Investigative scales. In addition, it was expected that the 14 scales would have weak correlations with scales that were theoretically distinct.

Third, MANOVAs were performed to examine differences in confidence and interest levels between career center high school students and traditional high school students. It was necessary to examine potential differences in order to determine whether the groups should be treated separately or as a whole in further analyses.

Next, two-way MANOVAs were performed to examine gender and race differences in confidence and interest levels. Means, standard deviations, F values, and effect sizes were assessed for each scale. This allowed the researchers to continue to assess the ESCI-HS’s concurrent validity. As with Study 1, it was predicted that gender differences would exist in self-efficacy; more precisely, it was expected that men would report higher levels of confidence in the Realistic, Investigative, Enterprising, and Conventional Holland themes and that women would report higher levels of confidence in the Social area (Betz, Borgen, et al., 1996, p. 12-14; Betz & Gwilliam, 2002).

Fifth, MANOVAs were conducted in order to examine differences in confidence and interest levels between work-bound and college bound students. It seemed necessary to examine potential differences between individuals who reported work-bound plans and individuals who reported plans including a bachelor’s degree, master’s degree, or professional degree. This analysis allowed for further examination of the ESCI-HS’s
concurrent validity. It was predicted that college bound individuals would report higher levels of confidence on the ESCI-HS.

Sixth, the relationships of the confidence scales to the parallel Basic Interest Scales on the SIE were examined using Pearson-product moment correlations. It was predicted that the strongest correlations would exist between parallel confidence and interest scales and confidence and interest scales within the same Holland theme.

Next, the extent to which joint use of these inventories yields domains with potential for career exploration, as indicated by patterns of high interest/high confidence or high interest but lower confidence, was analyzed. The ESCI-HS and SIE scores were categorized as high and low, and cross-classifications of confidence and interest on parallel activity domains were performed. The number of dimensions on which individuals possessed both high confidence and high interests was examined in relationship to the total CDMSE score. It was postulated that the more areas of possible exploration, the higher the CDMSE score.

The relationships of confidence to career decision self-efficacy were then examined. Six confidence scales (Mathematics, Science, Using Technology, Writing, Public Speaking and Leadership, and Cultural Sensitivity) were used in the regression analyses. Previous research has investigated the relationship of these six confidence dimensions to career decision self-efficacy among college students (Paulsen & Betz, in press). The authors proposed that these dimensions could be considered as central to the goals of a college education. The present analyses were performed to detect whether these confidence scales accounted for similar amounts of variance in career decision self-efficacy among high school students. The confidence scores served as the independent variables, and the total CDMSE
score served as the dependent variable. Between gender simultaneous linear regression analyses were also performed using the same independent variables.

Finally, the students’ written responses regarding influences upon their educational plans were classified into different categories. The number of influences upon educational plans was greater than the number of participants in the study, as several students mentioned multiple influences.
<table>
<thead>
<tr>
<th>Scale</th>
<th>Sample Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nature/Agriculture (R)^{3}</td>
<td>Manage the landscaping for a city park</td>
</tr>
<tr>
<td>Mechanical (R)</td>
<td>Install drapery rods</td>
</tr>
<tr>
<td>Outdoor/Physical (R)</td>
<td>Work as a police officer</td>
</tr>
<tr>
<td>Mathematics (I)</td>
<td>Calculate the dollar savings from an item on sale</td>
</tr>
<tr>
<td>Science (I)</td>
<td>Learn about the way a new medication works</td>
</tr>
<tr>
<td>Creative Production (A)</td>
<td>Produce a music video</td>
</tr>
<tr>
<td>Writing (A)</td>
<td>Write a movie review</td>
</tr>
<tr>
<td>Cultural Sensitivity (S)</td>
<td>Plan a holiday party for people of different religions</td>
</tr>
<tr>
<td>Helping (S)</td>
<td>Volunteer in a nursing home or hospital</td>
</tr>
<tr>
<td>Teaching/Training (S)</td>
<td>Coach a kids’ sports team</td>
</tr>
<tr>
<td>Public Speaking and Leadership (E)</td>
<td>Speak at your class graduation</td>
</tr>
<tr>
<td>Sales and Organizational Management (E)</td>
<td>Manage a restaurant or clothing store</td>
</tr>
<tr>
<td>Office Services (C)</td>
<td>Develop a timeline to complete a project</td>
</tr>
<tr>
<td>Using Technology (C)</td>
<td>Use a spreadsheet or word processing program</td>
</tr>
</tbody>
</table>

Table 3.1: Sample Items for the Scales of the Expanded Skills Confidence Inventory-High School

Note: Respondents are asked to indicate how much confidence they have that they could accomplish each activity, task, or school subject. Responses are obtained on a 5-point scale ranging from No Confidence at All (1) to Complete Confidence (5).

^3 The letters in parentheses denote the corresponding Holland theme. R = Realistic; I = Investigative; A = Artistic; S = Social; E = Enterprising; C = Conventional.
<table>
<thead>
<tr>
<th>Scale</th>
<th>Sample Item</th>
</tr>
</thead>
</table>
| Outdoor Environment, Plants, and Animals (R)
| Construction and Engineering (R)          | Working outdoors                                 |
| Protective Services (R)                   | Civil engineer                                   |
| Working with Numbers (I)                  | Security guard                                   |
| Health and Science (I)                    | Using a calculator                               |
| Music and Arts (A)                        | Watching an open-heart operation                 |
| Writing and Mass Communications (A)       | Singing in a choir                               |
| Cultural Relations (S)                    | Author of novels                                 |
| Helping Others (S)                        | Bilingual teacher                                |
| Teaching and Training (S)                 | Counseling distressed individuals                |
| Law and Politics (E)                      | Being a teaching assistant                       |
| Business, Sales, and Marketing (E)        | Persuading a jury                                |
| Office and Project Management (C)         | Trading stocks                                   |
| Working with Computers (C)                | Working with new office equipment                |
|                                           | Constructing a Web site                          |

Table 3.2: Sample Items for the Basic Interest Scales of the Strong Interest Explorer

Note. Participants are instructed to respond on a 3-level Likert-type interest continuum; the response options include Dislike (1), Not sure (2), and Like (3).

The letters in parentheses denote the corresponding Holland theme. R = Realistic; I = Investigative; A = Artistic; S = Social; E = Enterprising; C = Conventional.
<table>
<thead>
<tr>
<th>Scale</th>
<th>Sample Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accurate Self-Appraisal</td>
<td>Determine what your ideal job would be</td>
</tr>
<tr>
<td>Gathering Occupational Information</td>
<td>Talk with a person already employed in the field you are interested in</td>
</tr>
<tr>
<td>Goal Selection</td>
<td>Choose a career that will fit your preferred lifestyle</td>
</tr>
<tr>
<td>Making Plans for the Future</td>
<td>Make a plan of your goals for the next five years</td>
</tr>
<tr>
<td>Problem Solving</td>
<td>Persistently work at your major or career goal even when you get frustrated</td>
</tr>
</tbody>
</table>

Table 3.3: Sample Items for the Scales of the Career Decision Self-efficacy Scale

Note. Participants are asked to indicate how much confidence they have that they could accomplish each of the tasks. Participants respond on a 5-point confidence continuum, ranging from No confidence at all (1) to Complete confidence (5).
CHAPTER 4

RESULTS

4.1 Study 1

The item-total correlations ranged from .29 to .85 for the 156 pilot items. The
majority of item-total correlations was above .50, with only one scale (Creative Production)
having an item with a value below .30. An item-total correlation of .30 is the usually
accepted minimum for an adequate item (Nunnally & Bernstein, 1994). The magnitude of
the item-total correlations served as the first criterion in final scale construction.

Items for each scale were retained (or not) based on the following additional criteria:
(1) non-extreme means (above 4.0 would indicate that most people have high confidence,
while below 2.5 would indicate generally low confidence); (2) large standard deviations; and
(3) content relevance to high school students. In addition, attempts were made to minimize
gender differences when possible by selecting items on which girls scored higher and items
on which boys scored higher. For example, on the Mechanical scale, an item on which men
scored higher was “Successfully complete a course in industrial arts”, while the item on
which women scored higher was “Hang wallpaper”. Similarly, on the Nature/Agriculture
scale, an item on which men scored higher was “Manage the landscaping for a city park”,
while the item on which women scored higher was “Plant a garden”. However, it was still
expected that gender differences would exist due to the scoring patterns of males and females on the items.

The final inventory consisted of 112 items divided among 14 scales, 8 items per scale. Again, the 14 scales correspond to the SIE interest domains.

Table 4.1 shows the internal consistency reliability values for the 14 scales. As shown in the table, values of alpha ranged from .83 (Outdoor/Physical scale and Office Services scale) to .94 (Public Speaking and Leadership scale). The mean value of the coefficient alphas was .87. The internal consistency reliability values for the SCI scales ranged from .82 (Realistic) to .87 (Enterprising).

A MANOVA examined gender differences for the final scales of the ESCI-HS. Because of unequal sample sizes in the present study (e.g., 38 males and 113 females in Study 1), a significance level of $\alpha = .025$ was adopted for the following MANOVAs and regression analyses. This is based on recommendations regarding potential violations of the statistical assumptions of normality and homogeneity of variance when unequal sample sizes are present (Keppel, 1991, p. 283). It is also important to note, however, that the $F$ test is relatively robust despite deviations from normality and small deviations of homogeneity (p. 106, 283). A significance level of $\alpha = .05$ was adopted for correlations.

Table 4.2 presents the means, standard deviations, $F$ values, and effect sizes for each of the 14 scales. Effect sizes were calculated by converting partial eta squared values into Cohen’s $f$, an effect size index for analysis of variance and covariance (Cohen, 1988). According to Cohen (1988), conventions for effect sizes are the following: a small effect is $f = .10$, a medium effect is $f = .25$, and a large effect is $f = .40$ (p. 285-7).
The analysis yielded an overall significant effect for gender ($F (1, 149) = 10.09, p < .001$, based on Wilks’ Lambda = .49). The observed power for this test was 1.0. Significant gender differences were found on the following individual scales: Mechanical ($F (1, 149) = 25.11, p < .001$), Outdoor/Physical ($F (1, 149) = 38.87, p < .001$), Mathematics ($F (1, 149) = 22.43, p < .001$), Science ($F (1, 149) = 8.93, p < .01$), and Using Technology ($F (1, 149) = 18.18, p < .001$).

The differences between males and females for the Mechanical and Outdoor/Physical scales were large effects, and the differences on the other scales were medium to large effects. In other words, the results indicate that men reported significantly higher levels of confidence on two out of the three Realistic scales (Mechanical and Outdoor/Physical), two out of the two Investigative scales (Mathematics and Science), and one out of the two Conventional scales (Using Technology). There were no significant gender differences on the following scales: Nature/Agriculture (Realistic), Creative Production (Artistic), Writing (Artistic), Cultural Sensitivity (Social), Helping (Social), Teaching/Training (Social), Public Speaking and Leadership (Enterprising), Sales and Organizational Management (Enterprising), and Office Services (Conventional).

Table 4.3 presents the correlations of the ESCI-HS scales with the General Confidence (Holland) themes as measured by the SCI (Betz, Borgen, et al., 1996). As stated previously, these analyses were performed in order to provide evidence for convergent and discriminant validity. For each ESCI-HS scale, the strongest Holland theme correlation is underlined. As shown by the table, 13 out of the 14 scales correlated most strongly with their corresponding Holland theme. For example, the Mechanical Scale (Realistic) correlated most strongly with the Holland Realistic theme ($r = .86$). The only scale that did
not correlate most strongly with its analogous Holland theme was Office Services. Instead, Office Services (Conventional) correlated most strongly with an adjacent theme on the Holland model, Enterprising ($r = .60$). Yet Office Services also correlated strongly with the Conventional ($r = .55$) and Social ($r = .58$) themes.

In addition, the patterns of correlations with the six Holland themes show a range of differentiation from .08 to .81 (Helping scale) to .31 to .60 (Office Services scale). Although not all of the ESCI-HS scales showed the weakest correlation with the Holland theme diagonal from them on the hexagonal model, the majority of scales had weak correlations with nonadjacent Holland themes.

According to Cohen (1988), product moment correlation coefficients serve as effect size indices. Conventions for effect sizes are the following: a small effect size is $r = .10$, a medium effect size is $r = .30$, and a large effect size is $r = .50$ (p. 79-80). As shown in Table 4.3, the correlations between ESCI-HS scales and their corresponding Holland theme as measured by the SCI were all above .50.

Table 4.4 provides the bivariate correlations among the ESCI-HS scales. Table 4.5 shows the strongest and weakest correlations among the ESCI-HS scales. The tables indicate that 11 out of the 14 scales correlated most strongly with another scale of the same theme. For example, the Nature/Agriculture scale correlated most strongly ($r = .71$) with the Outdoor/Physical scale, which is also a Realistic scale. The three scales that did not correlate most strongly with another scale from the same Holland theme were Science, Office Services, and Using Technology. Science correlated most strongly with Outdoor/Physical ($r = .62$), although its second highest correlation was with Mathematics ($r = .52$), which is also an Investigative scale. Office Services correlated most strongly with Teaching/Training ($r =
.67) and Using Technology correlated most strongly with Mathematics ($r = .52$). Table 4.5 also illustrates that 9 out of the 14 scales’ weakest correlations were with nonadjacent scales on the Holland hexagonal model.

4.2 Study 2

Means, standard deviations, score distributions, and item-total correlations were calculated for each item on the revised (112 item) ESCI-HS. The item-total correlations ranged from .22 to .78 for the 112 items. The majority of item-total correlations was above .50. Four scales (Mathematics, Science, Teaching/Training, and Office Services) had one item with a value below .30, which is the usually accepted minimum for an adequate item (Nunnally & Bernstein, 1994).

The items that had item-total correlations below .30 were “Calculate the dollar savings from an item on sale” (Mathematics scale), “Understand the scientific basis of a medical breakthrough” (Science scale), “Coach a kids’ sports team” (Teaching/Training scale), and “Make copies on both sides of a page” (Office Services scale).

Table 4.6 shows the internal consistency reliability values for the 14 8-item ESCI-HS scales. As shown in the table, values of alpha ranged from .79 (Science, Teaching/Training, and Office Services scales) to .88 (Helping scale). The mean value of the coefficient alphas was .83. The internal consistency reliability values for the 14 10-item SIE scales were also calculated. As stated previously, the response options for the SIE were changed into a 3-level Likert-type continuum for the purposes of Study 2. Values of alpha ranged from .83 (Music and Arts scale) to .93 (Working with Computers scale). The mean value of the coefficient alphas was .88. The internal consistency reliability value for the total CDMSE-SF scale was .95.
Table 4.7 shows the bivariate correlations among the 14 scales of the ESCI-HS. It was expected that the strongest correlations would be found between scales of the same Holland theme. Nine out of the 14 scales correlated most strongly with another scale of the same theme. For example, the Helping scale correlated most strongly ($r = .69$) with the Teaching/Training scale, which is also a Social scale. Four of the five remaining scales (Mathematics, Science, Writing, and Sales and Organizational Management) had their second highest correlation with another scale of the same theme. For example, the Mathematics scale (Investigative) correlated most highly ($r = .62$) with the Mechanical scale (Realistic), yet its second highest correlation ($r = .54$) was with the Science scale (Investigative). The final scale Office Services (Conventional) correlated most highly with an Enterprising scale, Sales and Organizational Management ($r = .79$). The correlation between Office Services and the other Conventional scale, Using Technology, was $r = .65$.

In addition, 12 out of the 14 scales’ weakest correlations were with nonadjacent scales on the Holland hexagonal model. The two scales that did not have their weakest correlations with nonadjacent scales were Creative Production and Office Services. It is important to note that the majority of scales had strong relationships with both adjacent and nonadjacent scales.

MANOVAs were conducted in order to examine potential differences on confidence and interest scales between career center students and traditional high school students. These tests were performed in order to determine whether the groups should be treated separately or as a whole in further analyses. As stated previously, a significance level of $\alpha = .025$ was adopted to correct for unequal sample sizes (e.g., 52 traditional students versus 33 career center students).
The first MANOVA examined differences in the 14 confidence scales on the ESCI-HS between career center and traditional students. The analysis yielded an overall nonsignificant effect between students ($F(1, 83) = 1.22, p = .28$, based on Wilks’ lambda = .80). The observed power for this analysis was .68. In other words, the results indicated that career center students did not have significantly different levels of confidence than traditional students.

A second MANOVA examined differences in the 14 interest scales between career center and traditional high school students. The analysis yielded an overall nonsignificant effect between students ($F(1, 82) = 1.60, p = .10$, based on Wilks’ lambda = .76). The observed power for the analysis was .82. In other words, the results indicated that career center students did not have significantly different interest levels than traditional students. Because of the lack of differences in confidence and interest levels between career center and traditional students, the groups were combined for further analyses. Thus, all of the high school students, regardless of whether they attended a career center, were grouped together.

Two-way MANOVAs (Gender x Race) were conducted on the confidence and interest scales. Results of the MANOVA for the 14 confidence scales indicated overall significant effects for gender ($F(1, 77) = 7.49, p < .001$, based on Wilks’ lambda = .38) and for race ($F(1, 77) = 2.95, p < .01$, based on Wilks’ lambda = .61). The observed power for these analyses was 1.0 and .99, respectively. The interaction between gender and race was nonsignificant ($F(1,77) = 1.72, p = .07$, based on Wilks’ lambda = .73).

Table 4.8 shows the means, standard deviations, $F$ values, and effect sizes for each scale on the ESCI-HS between gender. Significant gender differences in confidence were found on the following individual scales: Mechanical ($F(1, 77) = 12.39, p < .01$),
Outdoor/Physical ($F (1, 77) = 15.59, p < .001$), Mathematics ($F (1, 77) = 5.94, p < .025$), Cultural Sensitivity ($F (1, 77) = 5.92, p < .025$), and Helping ($F (1, 77) = 31.48, p < .001$).

The differences between men and women for the Mechanical, Outdoor/Physical, and Helping scales were large effects, and the differences for the Mathematics and Cultural Sensitivity scales were medium effects. The largest effect size was found for the Helping scale ($f = .64$). In other words, the results indicate that men reported significantly higher levels of confidence on two out of the three Realistic scales (Mechanical and Outdoor/Physical) and one out of the two Investigative scales (Mathematics). Women reported significantly higher levels of confidence on two out of the three Social scales (Cultural Sensitivity and Helping). There were no significant gender differences on the following scales: Nature/Agriculture (Realistic), Science (Investigative), Creative Production (Artistic), Writing (Artistic), Teaching/Training (Social), Public Speaking and Leadership (Enterprising), Sales and Organizational Management (Enterprising), Office Services (Conventional), and Using Technology (Conventional).

Table 4.9 shows the means, standard deviations, $F$ values, and effect sizes for each scale on the ESCI-HS between African American and Caucasian individuals. Biracial students were not utilized as a separate group due to small sample size ($n = 4$). Significant race differences in confidence were found on the following individual scales: Creative Production ($F (1, 77) = 11.86, p < .01$), Writing ($F (1, 77) = 8.15, p < .01$), Cultural Sensitivity ($F (1, 77) = 14.63, p < .001$), Helping ($F (1, 77) = 5.61, p < .025$), Teaching/Training ($F (1, 77) = 6.08, p < .025$), Public Speaking and Leadership ($F (1, 77) = 13.73, p < .001$), and Sales and Organizational Management ($F (1, 77) = 10.05, p < .01$).
The race differences on the Cultural Sensitivity and Public Speaking and Leadership scales were large effects, while the differences on the Creative Production, Writing, Helping, Teaching/Training, and Sales and Organizational Management scales were medium to large effects. In other words, the results indicate that African American students reported significantly higher levels of confidence on two out of the two Artistic scales (Creative Production and Writing), three out of three Social scales (Cultural Sensitivity, Helping, Teaching/Training), and two out of two Enterprising scales (Public Speaking and Leadership and Sales and Organizational Management). There were no significant race differences on the following scales: Nature/Agriculture (Realistic), Mechanical (Realistic), Outdoor/Physical (Realistic), Mathematics (Investigative), Science (Investigative), Office Services (Conventional), and Using Technology (Conventional).

Results of the two-way MANOVA for the 14 interest scales indicated overall significant effects for gender ($F (1, 76) = 5.91, p < .001$, based on Wilks’ lambda $= .43$), race ($F (1, 76) = 4.55, p < .001$, based on Wilks’ lambda $= .50$), and the interaction between gender and race ($F (1, 76) = 2.80, p < .01$, based on Wilks’ lambda $= .62$). The observed power for these analyses was 1.0, 1.0, and .98, respectively. Because the multivariate interaction between gender and race was significant, the univariate interaction effects were first studied.

Significant interaction differences in interest were found on five individual scales: Outdoor Environment, Plants, and Animals ($F (1, 76) = 5.28, p < .025$), Cultural Relations ($F (1, 76) = 7.11, p < .01$), Helping Others ($F (1, 76) = 13.21, p < .01$), Teaching and Training ($F (1, 76) = 5.33, p < .025$), and Business, Sales, and Marketing ($F (1, 76) = 6.91, p < .025$).
For three of the scales (Cultural Relations, Teaching and Training, and Business, Sales and Marketing), African American males and females reported higher interest levels than both Caucasian males and females. For the Helping Others scale, both African American and Caucasian females reported higher interest levels, followed by African American males and Caucasian males. The interest difference on the Helping Others scale between African American and Caucasian males was .9 on a three-point scale. For the Outdoor Environment, Plants, and Animals scale, Caucasian females and African American males reported higher interest levels than African American females and Caucasian males. The interaction effect on the Helping Others scale was large ($f = .42$), while the differences on the Outdoor Environment, Plants, and Animals, Cultural Relations, Teaching and Training, and Business, Sales, and Marketing scales were medium effects.

The univariate main effects were then studied for interest scales on which there were nonsignificant interaction effects. A significant gender difference in interest was found on the Construction and Engineering scale ($F (1, 76) = 19.43, p < .001$). In other words, males reported significantly higher levels of interest on Construction and Engineering, a Realistic scale. This was a large effect ($f = .51$).

Significant race differences in interest were found on the following individual scales: Working with Numbers ($F (1, 76) = 16.63, p < .001$), Music and Arts ($F (1, 76) = 18.90, p < .001$), Writing and Mass Communication ($F (1, 76) = 15.65, p < .001$), Law and Politics ($F (1, 76) = 17.78, p < .001$), and Office and Project Management ($F (1, 76) = 17.50, p < .001$). African Americans reported significantly higher interest levels on each of the interest scales. The race differences were all large effects ($f > .44$).
MANOVAs were then performed to examine differences in confidence and interest levels between individuals who reported work-bound plans and individuals who reported college bound plans. Table 4.10 shows the means, standard deviations, F values, and effect sizes for each scale on the ESCI-HS. The analysis yielded an overall significant effect for confidence levels ($F(1, 81) = 2.59, p < .01$, based on Wilks’ lambda = .65). The observed power for this analysis was .97. Significant confidence differences between individuals with work-bound plans and individuals with college bound plans were found on the following scales: Writing ($F(1, 81) = 7.78, p < .01$), Helping ($F(1, 81) = 10.80, p < .01$), Teaching/Training ($F(1, 81) = 10.50, p < .01$), Public Speaking and Leadership ($F(1, 81) = 13.20, p < .001$), Sales and Organizational Management ($F(1, 81) = 11.35, p < .01$), and Office Services ($F(1, 81) = 10.23, p < .01$).

The difference on the Public Speaking and Leadership scale was a large effect, while the differences on the Writing, Helping, Teaching/Training, Sales and Organizational Management, and Office Services scales were medium to large effects. In other words, individuals who reported college bound plans had significantly higher levels of confidence on one out of the two Artistic scales (Writing), two out of the three social scales (Helping and Teaching/Training), two out of the two Enterprising scales (Public Speaking and Leadership and Sales and Organizational Management), and one out of the two Conventional scales (Office Services). There were no significant differences in confidence on Nature/Agriculture (Realistic), Mechanical (Realistic), Outdoor/Physical (Realistic), Mathematics (Investigative), Science (Investigative), Creative Production (Artistic), Cultural Sensitivity (Social), and Using Technology (Conventional).
Table 4.11 shows the means, standard deviations, $F$ values, and effect sizes for each scale on the SIE. The analysis yielded an overall significant effect in interest levels ($F (1, 80) = 2.22, p < .025$, based on Wilks’ lambda $= .68$). The observed power for this analysis was .94. Significant interest differences between individuals with work-bound and individuals with college bound plans were found on the following scales: Working with Numbers ($F (1, 80) = 9.84, p < .01$), Health and Science ($F (1, 80) = 5.58, p < .025$), Writing and Mass Communication ($F (1, 80) = 6.87, p < .01$), Cultural Relations ($F (1, 80) = 8.05, p < .01$), Helping Others ($F (1, 80) = 9.47, p < .01$), Teaching and Training ($F (1, 80) = 11.86, p < .01$), Law and Politics ($F (1, 80) = 7.05, p < .01$), and Office and Project Management ($F (1, 80) = 8.17, p < .01$).

The differences between all of the statistically significant scales were medium to large effects. The largest effect size was for the Teaching and Training scale ($f = .38$). In other words, individuals who reported college bound plans had significantly higher interest levels on two out of the two Investigative scales (Working with Numbers and Health and Science), one out of the two Artistic scales (Writing and Mass Communication), three out of the three Social scales (Cultural Relations, Helping Others, and Teaching and Training), one out of the two Enterprising scales (Law and Politics), and one out of the two Conventional scales (Office and Project Management). There were no significant differences in interest on the following scales: Outdoor Environment, Plants, and Animals (Realistic), Construction and Engineering (Realistic), Protective Services (Realistic), Music and Arts (Artistic), Business, Sales, and Marketing (Enterprising), and Working with Computers (Conventional).
Table 4.12 displays the bivariate correlations between ESCI-HS scales and SIE scales. For each ESCI-HS scale, the SIE scale with which it has its strongest correlation is underlined. Thirteen out of the 14 confidence scales had the strongest correlation with their parallel interest scale. This demonstrates that the majority of the confidence scales corresponded to their parallel interest scale as predicted. For example, the ESCI-HS Nature/Agriculture scale correlated most strongly ($r = .62$) to its parallel SIE Outdoor Environment, Plants, and Animals scale. Both of these scales are classified as Holland Realistic themes. The only confidence scale that did not have the strongest correlation with its parallel interest scale was Public Speaking and Leadership. This ESCI-HS scale correlated most strongly with the SIE Teaching and Training scale ($r = .55$), a Social scale. The correlation between Public Speaking and Leadership and its parallel SIE scale Law and Politics was $r = .48$. Finally, as shown by Table 4.12, the correlations between parallel confidence and interest scales ranged from .42 to 70.

Correlations between confidence and interest scales within the same Holland theme were also examined. As shown by Table 4.12, all of the correlations between confidence and interest scales within the same theme were statistically significant, except for correlations between the ESCI-HS and SIE Investigative scales. In addition, the majority of the correlations (28 out of 34) between confidence and interest scales within the same theme were above $r = .40$.

The correlations between nonadjacent confidence and interest scales according to Holland’s hexagonal model were also examined. It was predicted that weak correlations would exist for nonadjacent Holland scales. Although for some of the scales correlations with adjacent Holland themes were higher than correlations with nonadjacent themes, for
several scales there was no difference in the strength of the correlations between adjacent and nonadjacent scales.

Next, the extent to which joint use of these inventories yields domains with potential for career exploration, as indicated by patterns of high interest/high confidence or high interest but lower confidence, was analyzed. The ESCI-HS and SIE scores were categorized as high and low and cross-classifications of confidence and interest on parallel activity domains were performed. The cutoff value for high interest was defined as greater than or equal to the 66th percentile value for each scale, while low interest was defined as less than or equal to 1.5. An average of 2.0 corresponded to “Not Sure” on the interest continuum. The means on the 14 SIE scales ranged from 1.76 (Outdoor Environment, Plants, and Animals) to 2.18 (Office and Project Management). The mean of the 14 SIE scales was 2.01.

The cutoff values for more and less confidence were based on interpretation recommendations within the SCI manual. High confidence was classified as values greater than or equal to 3.5 and low confidence was classified as values less than or equal to 2.7 (Betz, Borgen, et al., 1996, p. 24). An average of 3.0 corresponded to “Moderate Confidence” on the continuum. The means on the 14 ESCI-HS scales ranged from 3.01 (Outdoor/Physical) to 4.09 (Helping). The mean of the 14 ESCI-HS scales was 3.53.

Table 4.13 shows the number of students who showed either high interest/high confidence or high interest/low confidence for each of the 14 parallel confidence and interest scales. As shown by the table, there were 359 instances in which high confidence/high interest was reported, yet only 7 instances in which high interest/low confidence was reported across the 14 scales.
In addition, it was postulated that students who possessed one or more domains with high confidence and high interest would be more confident about their career decision-making skills. It was expected that the more areas of possible exploration, the higher the CDMSE score. Because the number of domains in which students expressed high confidence/high interest ranged from 0 to 13 (out of 14), the number of domains were classified into three categories: 0 domains of high confidence/high interest, 1-3 domains of high confidence/high interest, and 4 and above domains of high confidence/high interest. Fifteen students were in the first category, 31 students were in the second category, and 39 students were in the third category.

An ANOVA was performed between the three frequencies of high confidence/high interest patterns with CDMSE as the dependent variable. Results were consistent with predictions. The analysis was statistically significant ($F (2, 82) = 11.03, p < .001$). The observed power for this analysis was .99. The means between the three classifications indicated that career decision-making confidence increased as the number of scales in which high confidence/high interest increased. More specifically, the total CDMSE mean for students with 0 domains of high confidence/high interest was 3.46, the mean for students with 1-3 domains of high confidence/high interest was 3.73, and the mean for students with 4 and above domains of high confidence/high interest was 4.22.

Next, the relationships of confidence scales (Mathematics, Science, Writing, Cultural Sensitivity, Public Speaking and Leadership, and Using Technology) to career decision self-efficacy were studied. First, bivariate correlations between the six confidence scales and the total CDMSE score were calculated. The correlations of the six scales to career decision self-efficacy ranged from .39 (Mathematics) to .66 (Writing). The correlations of all of the
ESCI-HS scales to career decision self-efficacy ranged from .10 (Outdoor/Physical) to .67 (Office Services).

Table 4.14 shows the results of the simultaneous linear regression analysis predicting CDMSE from the six ESCI-HS scales. The confidence scores served as the independent variables, and the total CDMSE score served as the dependent variable. The value of $R^2$ indicates that the six confidence scales accounted for 57% of the variance in career decision self-efficacy ($F (6, 78) = 16.88, p < .001$). This suggests that higher confidence on these six scales is significantly related to higher confidence in making career decisions. However, only the Writing ($B = .27, p < .025$) and Cultural Sensitivity ($B = .26, p < .025$) scales contributed significantly to the regression.

As shown in Table 4.15, analyses between gender indicated differences in the amount of variance in CDMSE accounted for by the six variables. First, the value of $R^2$ for men was .62 ($F (6, 27) = 7.36, p < .001$), while the value of $R^2$ for women was .56 ($F (6, 44) = 9.15, p < .001$). None of the individual scales contributed significantly to the regression for men or women. Only the Cultural Sensitivity scale approached significance ($B = .34, p = .04$) for men. For women, only the Writing scale approached significance ($B = .37, p < .03$).

Finally, participants’ written responses regarding the influences upon their educational plans were classified into three broad categories, environmental, personal, and background, and subcategories. This framework was based on previous work that investigated high school students’ perceptions of influences on their career expectations (Paa & McWhirter, 2000). It is important to note that participants’ responses overlap between categories, as numerous students discussed more than one influence, and some students did not respond.
The first category concerns environmental influences. Thirty-four students mentioned family influences upon their educational plans. More specifically, fifteen students mentioned their family or parents, eleven students mentioned their mother, three students mentioned an aunt or uncle, two students mentioned grandparents, two students mentioned their father, and one student mentioned a sibling. Six students mentioned the impact of mentors or seeing the success of others, five students mentioned coursework or school, five students discussed teachers, and three mentioned the career center. Finally, two students mentioned friends, one student mentioned teammates, one student mentioned grades, and one student referred to the media.

The second category includes personal influences. Twenty-two students reported a desire to achieve their goals, succeed, or “do something” with their lives. Of those twenty-two students, five mentioned that they wanted to be the first person in their family to graduate high school or attend college, and two reported a desire to “do better” than their parents. Fifteen students mentioned their interests as an influence upon their educational plans. Eight students referred to wealth or lifestyle. Four students mentioned that the amount of education necessary to get a job in a specific career influenced their educational plans. Two students reported a desire to help others, one student mentioned likes and dislikes about a job he had, one student reported being realistic, and one student stated that religion had influenced his educational plans.

The third category is background influences. Six students mentioned that their life experiences have influenced their educational plans, and three students reported that their natural ability impacted their plans.
Thus, the most cited influences upon educational plans were family, goals, and interests. It is important to note that themes of encouragement and support in spite of opposition and the necessity of education were frequently mentioned. For example, one student wrote, “My mom helped me to get where I am now. How she doesn’t let me give up, but to keep on going.” Another student wrote, “My mother and my basketball teammates. Everyone always tells me to do the right things, and to keep my head up, and stay strong. Work hard for what I want, and to not stop until I reach my goals in life”. Another student commented, “I don’t want to see myself coming out of school and not going anywhere. Seeing myself not succeeding in life scares me the most”. Finally, one student wrote, “Well knowing that my parents did not make good for themselves I feel that I can make good for me all by myself. I want to do a lot with my life and nothing is going to stand in my way. I am going to be rich if it kills me. I am going to be somebody”.
<table>
<thead>
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<th>Scale</th>
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</tr>
</thead>
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<tr>
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<tr>
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<tr>
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<td>Science (I)</td>
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<td>Creative Production (A)</td>
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<td>Writing (A)</td>
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<tr>
<td>Cultural Sensitivity (S)</td>
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Table 4.1: Internal Consistency Reliabilities of the Expanded Skills Confidence Inventory-High School Scales in Study 1

Note: The values of alpha are based on the responses of 154 first-year college students. Each scale has 8 items.
^a The letters in parentheses denote the corresponding Holland theme. R = Realistic; I = Investigative; A = Artistic; S = Social; E = Enterprising; C = Conventional.
<table>
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<tr>
<th>Scale</th>
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<th>$f^b$</th>
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Table 4.2: Gender Comparisons on the ESCI-HS Scales in Study 1

Note: The results are based on the responses on 38 men and 113 women, for a total of 151 college students. Scale means range from 1-5. Higher means on the scales reflect greater levels of confidence in one’s ability to complete activities or tasks in those domains.

a The multivariate $F$ for gender was 10.09, based on Wilks’ lambda = .49. b The $f$ values represent effect size estimates. The conventions regarding effect sizes are the following: $f = .10$ is a small effect, $f = .25$ is a medium effect, and $f = .40$ is a large effect. c The letters in parentheses denote the corresponding Holland theme. R = Realistic; I = Investigative; A = Artistic; S = Social; E = Enterprising; C = Conventional.

*p < .01. **p < .001.
<table>
<thead>
<tr>
<th>ESCI-HS Scale</th>
<th>Realistic</th>
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<th>Artistic</th>
<th>Social</th>
<th>Enterprising</th>
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Table 4.3: Correlations of ESCI-HS Scales to General Confidence (Holland) Themes in Study 1

Note. The bivariate correlations are based on the responses of 38 men, 114 women, and 2 unknown, for a total of 154 college students. For each ESCI-HS scale, the General Confidence (Holland) Theme with which it has its strongest correlation is underlined. The General Confidence Themes were measured by the Skills Confidence Inventory (Betz, Borgen, et al., 1996).

* The letters in parentheses denote the corresponding Holland theme. R = Realistic; I = Investigative; A = Artistic; S = Social; E = Enterprising; C = Conventional.

*p < .01, two-tailed.
<table>
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<tr>
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<tr>
<td>6. Creative Production (A)</td>
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<tr>
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<tr>
<td>11. Public Speaking and Leadership (E)</td>
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<tr>
<td>12. Sales and Organizational Management (E)</td>
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<tr>
<td>13. Office Services (C)</td>
<td>1.0</td>
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<td>14. Using Technology (C)</td>
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</tbody>
</table>

Table 4.4: Intercorrelations among ESCI-HS Scales in Study 1
Table 4.4 continued

Note. The bivariate correlations are based on the responses of 38 men, 114 women, and 2 unknown, for a total of 154 first-year college students. All correlations greater than or equal to $r = .21$ are significant at $p < .01$, two-tailed.

*a The letters in parentheses denote the corresponding Holland theme. R = Realistic; I = Investigative; A = Artistic; S = Social; E = Enterprising; C = Conventional.
<table>
<thead>
<tr>
<th>Scale</th>
<th>Strongest Correlations</th>
<th>Weakest Correlations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nature/Agriculture (R)</td>
<td>.71 Outdoor/Physical (R)</td>
<td>.17 Public Speaking and Leadership (E)</td>
</tr>
<tr>
<td>Mechanical (R)</td>
<td>.72 Outdoor/Physical (R)</td>
<td>.22 Public Speaking and Leadership (E)</td>
</tr>
<tr>
<td>Outdoor/Physical (R)</td>
<td>.72 Mechanical (R)</td>
<td>.29 Writing (A)</td>
</tr>
<tr>
<td>Mathematics (I)</td>
<td>.52 Science (I)</td>
<td>.18 Public Speaking and Leadership (E)</td>
</tr>
<tr>
<td></td>
<td>.52 Using Technology (C)</td>
<td></td>
</tr>
<tr>
<td>Science (I)</td>
<td>.62 Outdoor/Physical (R)</td>
<td>.21 Public Speaking and Leadership (E)</td>
</tr>
<tr>
<td>Creative Production (A)</td>
<td>.64 Writing (A)</td>
<td>.20 Mathematics (I)</td>
</tr>
<tr>
<td>Writing (A)</td>
<td>.64 Creative Production (A)</td>
<td>.21 Mathematics (I)</td>
</tr>
<tr>
<td>Cultural Sensitivity (S)</td>
<td>.79 Helping (S)</td>
<td>.18 Using Technology (C)</td>
</tr>
<tr>
<td>Helping (S)</td>
<td>.79 Cultural Sensitivity (S)</td>
<td>.11 Using Technology (C)</td>
</tr>
<tr>
<td>Teaching/Training (S)</td>
<td>.77 Helping (S)</td>
<td>.28 Using Technology (C)</td>
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<td>Public Speaking and Leadership (E)</td>
<td>.73 Sales and Organizational</td>
<td>.16 Using Technology (C)</td>
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<td></td>
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<td>Sales and Organizational</td>
<td>.73 Public Speaking and</td>
<td>.28 Using Technology (C)</td>
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<tr>
<td>Management (E)</td>
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<tr>
<td>Office Services (C)</td>
<td>.67 Teaching/Training (S)</td>
<td>.31 Mechanical (R)</td>
</tr>
<tr>
<td>Using Technology (C)</td>
<td>.52 Mathematics (I)</td>
<td>.11 Helping (S)</td>
</tr>
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</table>

Table 4.5: Strongest and Weakest Correlations among ESCI-HS Scales in Study 1

Note: The bivariate correlations are based on the responses of 38 men, 114 women, and 2 unknown, for a total of 154 first-year college students. The letters in parentheses denote the corresponding Holland theme. R = Realistic; I = Investigative; A = Artistic; S = Social; E = Enterprising; C = Conventional.
<table>
<thead>
<tr>
<th>Scale</th>
<th>Alpha Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nature/Agriculture (R)&lt;sup&gt;a&lt;/sup&gt;</td>
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<td>Mechanical (R)</td>
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<td>Outdoor/Physical (R)</td>
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<td>Helping (S)</td>
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<td>Public Speaking and Leadership (E)</td>
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<td>Sales and Organizational Management (E)</td>
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<td>Office Services (C)</td>
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<td>Using Technology (C)</td>
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</table>

Table 4.6: Internal Consistency Reliabilities of the ESCI-HS Scales in Study 2

Note. The values of alpha are based on the responses of 85 high school students. Each scale has 8 items.

<sup>a</sup>The letters in parentheses denote the corresponding Holland theme.  
R = Realistic;  
I = Investigative;  
A = Artistic;  
S = Social;  
E = Enterprising;  
C = Conventional.
<table>
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<th>6</th>
<th>7</th>
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<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
</tr>
</thead>
<tbody>
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<td>1. Nature/Agriculture (R)*</td>
<td>1.0</td>
<td>.68</td>
<td>.65</td>
<td>.41</td>
<td>.53</td>
<td>.44</td>
<td>.31</td>
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<td>.33</td>
<td>.14</td>
<td>.31</td>
<td>.34</td>
<td>.47</td>
</tr>
<tr>
<td>2. Mechanical (R)</td>
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<td>.42</td>
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<tr>
<td>3. Outdoor/Physical (R)</td>
<td>1.0</td>
<td>.44</td>
<td>.48</td>
<td>.31</td>
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<td>.10</td>
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<td>6. Creative Production (A)</td>
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<td>7. Writing (A)</td>
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<td>8. Cultural Sensitivity (S)</td>
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<td>9. Helping (S)</td>
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<td>10. Teaching/Training (S)</td>
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<tr>
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<td>13. Office Services (C)</td>
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<tr>
<td>14. Using Technology (C)</td>
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</table>

Table 4.7: Intercorrelations among ESCI-HS Scales in Study 2
Table 4.7 continued

Note. The bivariate correlations are based on the responses of 85 junior and senior high school students. Correlations greater than or equal to $r = .23$ are significant at $p < .05$, two-tailed.

* The letters in parentheses denote the corresponding Holland theme. R = Realistic; I = Investigative; A = Artistic; S = Social; E = Enterprising; C = Conventional.
<table>
<thead>
<tr>
<th>Scale</th>
<th>Men</th>
<th>Women</th>
<th>F (1, 77)</th>
<th>( f^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nature/Agriculture (R)(^c)</td>
<td>3.19 (\bar{M})</td>
<td>2.94 (\bar{M})</td>
<td>.66</td>
<td>.10</td>
</tr>
<tr>
<td>Mechanical (R)</td>
<td>3.71 (\bar{M})</td>
<td>3.15 (\bar{M})</td>
<td>12.39**</td>
<td>.40</td>
</tr>
<tr>
<td>Outdoor/Physical (R)</td>
<td>3.45 (\bar{M})</td>
<td>2.65 (\bar{M})</td>
<td>15.59***</td>
<td>.45</td>
</tr>
<tr>
<td>Mathematics (I)</td>
<td>3.60 (\bar{M})</td>
<td>3.33 (\bar{M})</td>
<td>5.94*</td>
<td>.28</td>
</tr>
<tr>
<td>Science (I)</td>
<td>3.26 (\bar{M})</td>
<td>3.20 (\bar{M})</td>
<td>1.88</td>
<td>.16</td>
</tr>
<tr>
<td>Creative Production (A)</td>
<td>3.55 (\bar{M})</td>
<td>3.39 (\bar{M})</td>
<td>3.01</td>
<td>.20</td>
</tr>
<tr>
<td>Writing (A)</td>
<td>3.58 (\bar{M})</td>
<td>3.71 (\bar{M})</td>
<td>.31</td>
<td>.06</td>
</tr>
<tr>
<td>Cultural Sensitivity (S)</td>
<td>3.34 (\bar{M})</td>
<td>3.85 (\bar{M})</td>
<td>5.92*</td>
<td>.28</td>
</tr>
<tr>
<td>Helping (S)</td>
<td>3.59 (\bar{M})</td>
<td>4.43 (\bar{M})</td>
<td>31.48***</td>
<td>.64</td>
</tr>
<tr>
<td>Teaching/Training (S)</td>
<td>3.65 (\bar{M})</td>
<td>3.99 (\bar{M})</td>
<td>3.29</td>
<td>.21</td>
</tr>
<tr>
<td>Public Speaking and Leadership (E)</td>
<td>3.67 (\bar{M})</td>
<td>3.85 (\bar{M})</td>
<td>.12</td>
<td>.04</td>
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<tr>
<td>Sales and Organizational Management (E)</td>
<td>3.81 (\bar{M})</td>
<td>3.74 (\bar{M})</td>
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</tr>
<tr>
<td>Office Services (C)</td>
<td>3.70 (\bar{M})</td>
<td>3.78 (\bar{M})</td>
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<td>.00</td>
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<tr>
<td>Using Technology (C)</td>
<td>3.59 (\bar{M})</td>
<td>3.45 (\bar{M})</td>
<td>1.01</td>
<td>.11</td>
</tr>
</tbody>
</table>

Table 4.8: Gender Comparisons on the ESCI-HS Scales in Study 2

**Note.** The results are based on the responses on 32 men and 49 women, for a total of 81 high school students. Scale means range from 1-5. Higher means on the scales reflect greater levels of confidence in one’s ability to complete activities or tasks in those domains.

\(^a\) The multivariate \( F \) for gender was 7.49, based on Wilks’ lambda = .38. \(^b\) The \( f \) values represent effect size estimates. The conventions regarding effect sizes are the following: \( f = .10 \) is a small effect, \( f = .25 \) is a medium effect, and \( f = .40 \) is a large effect. \(^c\) The letters in parentheses denote the corresponding Holland theme. \( R = \) Realistic; \( I = \) Investigative; \( A = \) Artistic; \( S = \) Social; \( E = \) Enterprising; \( C = \) Conventional.

\( * \text{p} < .025. \quad ** \text{p} < .01. \quad *** \text{p} < .001. \)
<table>
<thead>
<tr>
<th>Scale</th>
<th>African Americans</th>
<th>Caucasians</th>
<th>F (1, 77)\textsuperscript{a}</th>
<th>f\textsuperscript{b}</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nature/Agriculture (R)\textsuperscript{c}</td>
<td>2.95 .82</td>
<td>3.27 .62</td>
<td>1.66</td>
<td>.15</td>
</tr>
<tr>
<td>Mechanical (R)</td>
<td>3.32 .80</td>
<td>3.54 .79</td>
<td>0.02</td>
<td>.00</td>
</tr>
<tr>
<td>Outdoor/Physical (R)</td>
<td>2.87 .97</td>
<td>3.25 .92</td>
<td>0.30</td>
<td>.06</td>
</tr>
<tr>
<td>Mathematics (I)</td>
<td>3.48 .68</td>
<td>3.33 .98</td>
<td>1.90</td>
<td>.16</td>
</tr>
<tr>
<td>Science (I)</td>
<td>3.25 .67</td>
<td>3.14 .70</td>
<td>0.85</td>
<td>.11</td>
</tr>
<tr>
<td>Creative Production (A)</td>
<td>3.62 .85</td>
<td>2.98 .79</td>
<td>11.86**</td>
<td>.39</td>
</tr>
<tr>
<td>Writing (A)</td>
<td>3.80 .71</td>
<td>3.24 .91</td>
<td>8.15**</td>
<td>.33</td>
</tr>
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<td>Cultural Sensitivity (S)</td>
<td>3.85 .63</td>
<td>3.07 .77</td>
<td>14.63***</td>
<td>.44</td>
</tr>
<tr>
<td>Helping (S)</td>
<td>4.26 .59</td>
<td>3.63 1.0</td>
<td>5.61*</td>
<td>.27</td>
</tr>
<tr>
<td>Teaching/Training (S)</td>
<td>3.98 .58</td>
<td>3.50 .71</td>
<td>6.08*</td>
<td>.28</td>
</tr>
<tr>
<td>Public Speaking and Leadership (E)</td>
<td>3.96 .71</td>
<td>3.26 .73</td>
<td>13.73***</td>
<td>.42</td>
</tr>
<tr>
<td>Sales and Organizational Management (E)</td>
<td>3.89 .65</td>
<td>3.41 .68</td>
<td>10.05**</td>
<td>.36</td>
</tr>
<tr>
<td>Office Services (C)</td>
<td>3.82 .62</td>
<td>3.52 .66</td>
<td>3.18</td>
<td>.20</td>
</tr>
<tr>
<td>Using Technology (C)</td>
<td>3.52 .79</td>
<td>3.47 .86</td>
<td>0.24</td>
<td>.05</td>
</tr>
</tbody>
</table>

Table 4.9: Race Comparisons on the ESCI-HS Scales in Study 2

Note. The results are based on the responses on 60 African Americans and 21 Caucasians, for a total of 81 high school students. Scale means range from 1-5. Higher means on the scales reflect greater levels of confidence in one’s ability to complete activities or tasks in those domains.

\textsuperscript{a} The multivariate F for race was 2.95, based on Wilks’ lambda = .61. \textsuperscript{b} The f values represent effect size estimates. The conventions regarding effect sizes are the following: f = .10 is a small effect, f = .25 is a medium effect, and f = .40 is a large effect. \textsuperscript{c} The letters in parentheses denote the corresponding Holland theme. R = Realistic; I = Investigative; A = Artistic; S = Social; E = Enterprising; C = Conventional.

* p < .025. ** p < .01. *** p < .001.
<table>
<thead>
<tr>
<th>Scale</th>
<th>Work-bound M</th>
<th>Work-bound SD</th>
<th>College bound M</th>
<th>College bound SD</th>
<th>F(1, 81)^a</th>
<th>f^b</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nature/Agriculture (R)^c</td>
<td>3.30</td>
<td>.73</td>
<td>2.99</td>
<td>.82</td>
<td>2.60</td>
<td>.18</td>
</tr>
<tr>
<td>Mechanical (R)</td>
<td>3.44</td>
<td>.90</td>
<td>3.34</td>
<td>.80</td>
<td>.27</td>
<td>.05</td>
</tr>
<tr>
<td>Outdoor/Physical (R)</td>
<td>3.03</td>
<td>.95</td>
<td>3.00</td>
<td>.99</td>
<td>.01</td>
<td>.00</td>
</tr>
<tr>
<td>Mathematics (I)</td>
<td>3.16</td>
<td>.77</td>
<td>3.51</td>
<td>.75</td>
<td>3.54</td>
<td>.21</td>
</tr>
<tr>
<td>Science (I)</td>
<td>3.08</td>
<td>.75</td>
<td>3.28</td>
<td>.71</td>
<td>1.26</td>
<td>.12</td>
</tr>
<tr>
<td>Creative Production (A)</td>
<td>3.16</td>
<td>.90</td>
<td>3.56</td>
<td>.87</td>
<td>3.41</td>
<td>.20</td>
</tr>
<tr>
<td>Writing (A)</td>
<td>3.28</td>
<td>.83</td>
<td>3.81</td>
<td>.75</td>
<td>7.78*</td>
<td>.31</td>
</tr>
<tr>
<td>Cultural Sensitivity (S)</td>
<td>3.42</td>
<td>.72</td>
<td>3.79</td>
<td>.70</td>
<td>4.51</td>
<td>.24</td>
</tr>
<tr>
<td>Helping (S)</td>
<td>3.71</td>
<td>.88</td>
<td>4.29</td>
<td>.64</td>
<td>10.80*</td>
<td>.37</td>
</tr>
<tr>
<td>Teaching/Training (S)</td>
<td>3.52</td>
<td>.72</td>
<td>4.01</td>
<td>.57</td>
<td>10.50*</td>
<td>.36</td>
</tr>
<tr>
<td>Public Speaking and Leadership (E)</td>
<td>3.31</td>
<td>.77</td>
<td>3.96</td>
<td>.72</td>
<td>13.20**</td>
<td>.40</td>
</tr>
<tr>
<td>Sales and Organizational</td>
<td>3.33</td>
<td>.73</td>
<td>3.88</td>
<td>.65</td>
<td>11.35*</td>
<td>.37</td>
</tr>
<tr>
<td>Management (E)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Office Services (C)</td>
<td>3.36</td>
<td>.67</td>
<td>3.87</td>
<td>.64</td>
<td>10.23*</td>
<td>.36</td>
</tr>
<tr>
<td>Using Technology (C)</td>
<td>3.39</td>
<td>1.0</td>
<td>3.51</td>
<td>.76</td>
<td>.32</td>
<td>.06</td>
</tr>
</tbody>
</table>

Table 4.10: Comparisons on the ESCI-HS Scales between Participants with Work-bound and College bound Plans in Study 2

Note. The results are based on the responses on 83 high school students. Twenty-three reported work-bound plans and 60 reported college bound plans. Scale means range from 1-5. Higher means on the scales reflect greater levels of confidence in one’s ability to complete activities or tasks in those domains.

^ The multivariate F was 2.59, based on Wilks’ lambda = .65.  The f values represent effect size estimates. The conventions regarding effect sizes are the following: f = .10 is a small effect, f = .25 is a medium effect, and f = .40 is a large effect. § The letters in parentheses denote the corresponding Holland theme. R = Realistic; I = Investigative; A = Artistic; S = Social; E = Enterprising; C = Conventional.

* p < .01. ** p < .001.
<table>
<thead>
<tr>
<th>Scale</th>
<th>Work-bound</th>
<th>College bound</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Outdoor Environment, Plants, and Animals (R)</td>
<td>1.84</td>
<td>.48</td>
</tr>
<tr>
<td>Construction and Engineering (R)</td>
<td>1.83</td>
<td>.58</td>
</tr>
<tr>
<td>Protective Services (R)</td>
<td>1.91</td>
<td>.61</td>
</tr>
<tr>
<td>Working with Numbers (I)</td>
<td>1.80</td>
<td>.57</td>
</tr>
<tr>
<td>Health and Science (I)</td>
<td>1.79</td>
<td>.55</td>
</tr>
<tr>
<td>Music and Arts (A)</td>
<td>2.03</td>
<td>.58</td>
</tr>
<tr>
<td>Writing and Mass Communication (A)</td>
<td>1.75</td>
<td>.60</td>
</tr>
<tr>
<td>Cultural Relations (S)</td>
<td>1.71</td>
<td>.57</td>
</tr>
<tr>
<td>Helping Others (S)</td>
<td>1.87</td>
<td>.61</td>
</tr>
<tr>
<td>Teaching and Training (S)</td>
<td>1.78</td>
<td>.57</td>
</tr>
<tr>
<td>Law and Politics (E)</td>
<td>1.75</td>
<td>.57</td>
</tr>
<tr>
<td>Business, Sales and Marketing (E)</td>
<td>1.86</td>
<td>.65</td>
</tr>
<tr>
<td>Office and Project Management (C)</td>
<td>1.94</td>
<td>.64</td>
</tr>
<tr>
<td>Working with Computers (C)</td>
<td>1.89</td>
<td>.74</td>
</tr>
</tbody>
</table>

Table 4.11: Comparisons on the SIE Scales between Participants with Work-bound and College bound Plans in Study 2

Note. The results are based on the responses on 82 high school students. Twenty-three reported work-bound plans and 59 reported college bound plans. Scale means range from 1-3. Higher means on the scales reflect greater levels of interest in those domains.

a The multivariate F was 2.22, based on Wilks’ lambda = .68.  b The f values represent effect size estimates. The conventions regarding effect sizes are the following: f = .10 is a small effect, f = .25 is a medium effect, and f = .40 is a large effect.  c The letters in parentheses denote the corresponding Holland theme. R = Realistic; I = Investigative; A = Artistic; S = Social; E = Enterprising; C = Conventional.

*p < .025. **p < .01.
<table>
<thead>
<tr>
<th>ESCL-HS Scale</th>
<th>SIE Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outdoor Environment, Plants, and Animals (R)</td>
<td>Working with Numbers (I)</td>
</tr>
<tr>
<td>.62*</td>
<td>.11</td>
</tr>
<tr>
<td>Mechanical (R)</td>
<td>Health and Science (I)</td>
</tr>
<tr>
<td>.31*</td>
<td>.35*</td>
</tr>
<tr>
<td>Outdoor/Physical (R)</td>
<td>Music and Arts (A)</td>
</tr>
<tr>
<td>.46*</td>
<td>.33*</td>
</tr>
<tr>
<td>Mathematics (I)</td>
<td>Writing and Mass Communication (A)</td>
</tr>
<tr>
<td>.16</td>
<td>.21</td>
</tr>
<tr>
<td>Science (I)</td>
<td>.19</td>
</tr>
<tr>
<td>.24*</td>
<td>.16</td>
</tr>
<tr>
<td>Creative Production (A)</td>
<td>.10</td>
</tr>
<tr>
<td>.22*</td>
<td>.96*</td>
</tr>
<tr>
<td>Writing (A)</td>
<td>.31*</td>
</tr>
<tr>
<td>.13</td>
<td>.61*</td>
</tr>
<tr>
<td>Cultural Sensitivity (S)</td>
<td>.18</td>
</tr>
<tr>
<td>.22*</td>
<td>.45*</td>
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<tr>
<td>Helping (S)</td>
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<tr>
<td>.15</td>
<td>.26*</td>
</tr>
<tr>
<td>Teaching/Training (S)</td>
<td>.13</td>
</tr>
<tr>
<td>.12</td>
<td>.42*</td>
</tr>
<tr>
<td>Public Speaking and Leadership (E)</td>
<td>.11</td>
</tr>
<tr>
<td>.00</td>
<td>.27*</td>
</tr>
<tr>
<td>Sales and Organizational Management (E)</td>
<td>.38*</td>
</tr>
<tr>
<td>.13</td>
<td>.27*</td>
</tr>
<tr>
<td>Office Services (C)</td>
<td>.37*</td>
</tr>
<tr>
<td>.07</td>
<td>.32*</td>
</tr>
<tr>
<td>Using Technology (C)</td>
<td>.21</td>
</tr>
<tr>
<td>.21</td>
<td>.41*</td>
</tr>
</tbody>
</table>

Table 4.12: Correlations between ESCL-HS and SIE Scales in Study 2
<table>
<thead>
<tr>
<th>ESCH-HS Scale</th>
<th>Cultural Relations (S)</th>
<th>Helping Others (S)</th>
<th>Teaching and Training (S)</th>
<th>Law and Politics (E)</th>
<th>Business, Sales, and Marketing (E)</th>
<th>Office and Project Management (C)</th>
<th>Working with Computers (C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nature/Agriculture (R)</td>
<td>.21*</td>
<td>.14</td>
<td>.24*</td>
<td>.21</td>
<td>.26*</td>
<td>.26*</td>
<td>.29*</td>
</tr>
<tr>
<td>Mechanical (R)</td>
<td>.07</td>
<td>-.04</td>
<td>.14</td>
<td>.17</td>
<td>.25*</td>
<td>.23*</td>
<td>.26*</td>
</tr>
<tr>
<td>Outdoor/Physical (R)</td>
<td>-.03</td>
<td>-.05</td>
<td>.13</td>
<td>.29*</td>
<td>.15</td>
<td>.12</td>
<td>.28*</td>
</tr>
<tr>
<td>Mathematics (I)</td>
<td>.06</td>
<td>.05</td>
<td>.26*</td>
<td>.25*</td>
<td>.31*</td>
<td>.31*</td>
<td>.26*</td>
</tr>
<tr>
<td>Science (I)</td>
<td>.23*</td>
<td>.04</td>
<td>.25*</td>
<td>.41*</td>
<td>.26*</td>
<td>.34*</td>
<td>.31*</td>
</tr>
<tr>
<td>Creative Production (A)</td>
<td>.34*</td>
<td>.34*</td>
<td>.52*</td>
<td>.40*</td>
<td>.60*</td>
<td>.57*</td>
<td>.38*</td>
</tr>
<tr>
<td>Writing (A)</td>
<td>.37*</td>
<td>.33*</td>
<td>.52*</td>
<td>.46*</td>
<td>.49*</td>
<td>.52*</td>
<td>.31*</td>
</tr>
<tr>
<td>Cultural Sensitivity (S)</td>
<td>.68*</td>
<td>.54*</td>
<td>.54*</td>
<td>.37*</td>
<td>.48*</td>
<td>.47*</td>
<td>.15</td>
</tr>
<tr>
<td>Helping (S)</td>
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<td>.69*</td>
<td>.54*</td>
<td>.35*</td>
<td>.35*</td>
<td>.32*</td>
<td>.02</td>
</tr>
<tr>
<td>Teaching/Training (S)</td>
<td>.51*</td>
<td>.55*</td>
<td>.59*</td>
<td>.41*</td>
<td>.45*</td>
<td>.47*</td>
<td>.16</td>
</tr>
<tr>
<td>Public Speaking and Leadership (E)</td>
<td>.38*</td>
<td>.41</td>
<td>.55*</td>
<td>.48*</td>
<td>.51*</td>
<td>.54*</td>
<td>.21</td>
</tr>
<tr>
<td>Sales and Organizational Management (E)</td>
<td>.46*</td>
<td>.41</td>
<td>.61*</td>
<td>.51*</td>
<td>.67*</td>
<td>.62*</td>
<td>.41*</td>
</tr>
<tr>
<td>Office Services (C)</td>
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<td>.36*</td>
<td>.59*</td>
<td>.47*</td>
<td>.57*</td>
<td>.60*</td>
<td>.27*</td>
</tr>
<tr>
<td>Using Technology (C)</td>
<td>.22*</td>
<td>.11</td>
<td>.39*</td>
<td>.32*</td>
<td>.45*</td>
<td>.54*</td>
<td>.63*</td>
</tr>
</tbody>
</table>

continued
Table 4.12 continued

**Note.** The bivariate correlations are based on the responses of 85 junior and senior high school students. The letters in parentheses denote the corresponding Holland theme: R = Realistic; I = Investigative; A = Artistic; S = Social; E = Enterprising; C = Conventional. For each ESCI-HS scale, the SIE scale with which it has its strongest correlation is underlined.

* $r < .05$
<table>
<thead>
<tr>
<th>Scalea</th>
<th>Highest Interest/High Confidence</th>
<th>Highest Interest/Low Confidence</th>
<th>Total Instances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nature/Agriculture &amp; Outdoor Environment, Plants, and Animals</td>
<td>17</td>
<td>2</td>
<td>359</td>
</tr>
<tr>
<td>Mechanical &amp; Construction and Engineering</td>
<td>23</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Outdoor/Physical &amp; Protective Services</td>
<td>24</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Mathematics &amp; Working with Numbers</td>
<td>21</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Science &amp; Health and Science</td>
<td>16</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Creative Production &amp; Music and Arts</td>
<td>24</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Writing &amp; Writing and Mass Communication</td>
<td>29</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Cultural Sensitivity &amp; Cultural Relations</td>
<td>32</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Helping &amp; Helping Others</td>
<td>32</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Teaching/Training &amp; Teaching and Training</td>
<td>28</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Public Speaking and Leadership &amp; Law and Politics</td>
<td>27</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Sales and Organizational Management &amp; Business, Sales, and Marketing</td>
<td>28</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Office Services &amp; Office and Project Management</td>
<td>30</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Using Technology &amp; Working with Computers</td>
<td>28</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

Note. There were a total of 85 junior and senior high school students.

The ESCL-HS confidence scale is listed first and its parallel SIE scale is listed second.
<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Predictor Variable</th>
<th>$R^2$</th>
<th>$F$</th>
<th>$B$</th>
<th>$t$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Career Decision Self-efficacy</td>
<td></td>
<td>.57</td>
<td>16.88**</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mathematics</td>
<td></td>
<td>.07</td>
<td>.73</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Science</td>
<td></td>
<td>-.02</td>
<td>-.17</td>
<td></td>
</tr>
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<td></td>
<td>Writing</td>
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<td>.27</td>
<td>2.30*</td>
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</tr>
<tr>
<td></td>
<td>Cultural Sensitivity</td>
<td></td>
<td>.26</td>
<td>2.55*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Public Speaking and Leadership</td>
<td></td>
<td>.18</td>
<td>1.65</td>
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</tr>
<tr>
<td></td>
<td>Using Technology</td>
<td></td>
<td>.19</td>
<td>1.91</td>
<td></td>
</tr>
</tbody>
</table>

Table 4.14: Linear Regression Analysis of Career Decision Self-efficacy using ESCI-HS scales in Study 2

Note. A simultaneous linear regression analysis was performed between career decision self-efficacy and six ESCI-HS scales. The six confidence scales accounted for 57% of the variance in career decision self-efficacy ($F$ (6, 78) = 16.88, $p < .001$).

* $p < .025$  ** $p < .001$
<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Predictor Variable</th>
<th>Males (^a)</th>
<th>Females (^b)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Career Decision Self-efficacy</td>
<td>Mathematics</td>
<td>.20</td>
<td>.03</td>
</tr>
<tr>
<td></td>
<td>Science</td>
<td>-.08</td>
<td>-.52</td>
</tr>
<tr>
<td></td>
<td>Writing</td>
<td>.08</td>
<td>.39</td>
</tr>
<tr>
<td></td>
<td>Cultural Sensitivity</td>
<td>.34</td>
<td>2.19</td>
</tr>
<tr>
<td></td>
<td>Public Speaking and Leadership</td>
<td>.28</td>
<td>1.66</td>
</tr>
<tr>
<td></td>
<td>Using Technology</td>
<td>.24</td>
<td>1.63</td>
</tr>
</tbody>
</table>

Table 4.15: Between Gender Linear Regression Analyses of Career Decision Self-efficacy in Study 2

Note. Simultaneous linear regression analyses were performed between career decision self-efficacy and six ESCI-HS scales separately for men and women.

\(^a\) For men, the six confidence scales accounted for 62% of the variance in career decision self-efficacy (\(F (6, 27) = 7.36, p < .001\)).

\(^b\) For women, the six confidence scales accounted for 56% of the variance in career decision self-efficacy (\(F (6, 44) = 9.15, p < .001\)).
CHAPTER 5
DISCUSSION

5.1 Review of objectives

The major objective of this study was to examine the reliability and validity of self-efficacy and interest measures with respect to basic domains of vocational activity in a non-college bound sample of high school students. More specifically, the purpose of Study 1 was to collect item analytic data for the items of the ESCI-HS and examine the criterion-related, convergent, and discriminant validity of the ESCI-HS.

The purpose of Study 2 was to evaluate the psychometric properties of the confidence and interest measures with high school students and examine the scales’ criterion-related validity. Additionally, objectives for Study 2 included the following: examining the relationship between parallel confidence and interest scales, evaluating whether the joint use of the inventories yields domains with potential for career exploration, analyzing the relationship between six ESCI-HS confidence scales and career decision self-efficacy, gathering qualitative data regarding influences upon students’ educational plans, and providing written results to students based on their responses.

5.2 Summary of results

The present studies resulted in the construction of 14 confidence scales that measure perceived self-efficacy or confidence with respect to basic domains of vocational activity for
high school students, particularly non-college bound students. The ESCI-HS is designed for joint use with a parallel interest measure, the Strong Interest Explorer. The findings from Study 1 and Study 2 provided initial evidence for the reliability and validity of the ESCI-HS.

In Study 1 a sample of 154 first-year college students was used to gather item analytic data for the ESCI-HS. Criteria such as item-total correlations, means, and standard deviations were utilized to select items. The final 14 scales of the ESCI-HS, 8 items per scale, were internally consistent; values of alpha ranged from .83 to .87. Additionally, the mean value of coefficient alphas was .87.

It was expected that gender differences would exist in self-efficacy; more precisely, it was predicted that men would report higher confidence levels in the Realistic, Investigative, Enterprising, and Conventional areas and that women would report higher confidence levels in the Social area (Betz, Borgen, et al., 1996, p. 12-4; Betz & Gwilliam, 2002). The results were largely consistent with predictions, providing initial evidence for the scale’s concurrent validity. Men reported significantly higher levels of confidence on five scales, including Mechanical (Realistic), Outdoor/Physical (Realistic), Mathematics (Investigative), Science (Investigative), and Using Technology (Conventional). However, there were no significant gender differences between Enterprising and Social confidence levels. Effect sizes were largest for Outdoor/Physical ($f = .51$), Mechanical ($f = .41$), and Mathematics ($f = .39$).

Evidence for the convergent and discriminant validity of the scales was also provided. First, it was predicted that the strongest correlations would exist between Holland domains as measured by the ESCI-HS and analogous General Confidence (Holland) themes as measured by the SCI. Findings showed that 13 out of the 14 ESCI-HS scales correlated
most strongly with their corresponding Holland theme, thus providing evidence for the scale’s convergent validity. The correlations between the 13 ESCI-HS scales and their corresponding Holland themes ranged from $r = .60$ (Mathematics scale) to $r = .86$ (Mechanical scale). The only scale that did not correlate most strongly with its analogous theme was Office Services. Instead, Office Services (Conventional) correlated most strongly with an adjacent theme on the Holland model, Enterprising ($r = .60$), although its correlation with the Conventional theme was also strong ($r = .55$).

Second, it was expected that weak correlations would exist between self-efficacy levels on the ESCI-HS and SCI in areas that are diagonal from each other on the Holland hexagonal model. The results indicated that the majority of the scales had weaker correlations with nonadjacent Holland themes than with adjacent themes. However, not all of the scales showed the weakest correlation with their diagonal theme on the hexagonal model. Additionally, the majority of correlations between ESCI-HS and SCI scales were statistically significant. Similar findings were reported between the ESCI scales and the SCI (Betz et al., 2003).

Other studies have also reported strong nonadjacent correlations between the Investigative and Conventional themes (Betz & Gwilliam, 2002). Study 1 found strong correlations between the Investigative ESCI-HS scales and the Conventional Holland theme as well. For example, the Mathematics scale correlated most strongly with the Investigative theme as predicted ($r = .60$), yet its correlation with the Conventional theme was also strong ($r = .59$).

In Study 1, the intercorrelations among the 14 ESCI-HS scales were also examined. It was expected that the strongest correlations would exist between scales of the same
Holland theme. Results indicated that 11 out of the 14 scales correlated most strongly with scales of the same Holland theme. The three scales that did not correlate most strongly with another scale from the same Holland theme were Science, Office Services, and Using Technology. Science correlated most strongly with Outdoor/Physical ($r = .62$), Office Services correlated most strongly with Teaching/Training ($r = .67$), and Using Technology correlated most strongly with Mathematics ($r = .52$).

Although Using Technology (Conventional) correlated most strongly with the Conventional Holland theme as measured by the SCI ($r = .70$), which is consistent with previous research using the ESCI (Betz et al., 2003), its correlation with the other Conventional ESCI-HS scale, Office Services, was weaker than its correlations with the Mathematics and Mechanical scales. Furthermore, Office Services (Conventional) had its strongest correlations with the Enterprising and Social ESCI-HS scales. For Study 1, it appears that as the Conventional theme becomes more saturated with computing and quantitative activities (Betz, Harmon et al., 1996), Office Services shows stronger associations with Enterprising and Social themes than with the Conventional theme.

In Study 2 a sample of 85 junior and senior high school students was utilized. As described previously in the Methodology section, the large percentage of students who expressed college bound plans was unexpected based on district and national statistics. Again, according to guidance personnel within the high school, approximately 30-35% of students apply to four-year colleges, although a smaller proportion of those students reportedly graduate.

First, the psychometric properties of the ESCI-HS and its parallel interest measure, the Strong Interest Explorer (SIE), were examined in Study 2. The majority of item-total
correlations on the ESCI-HS was above .50, although four scales had one item with a value below .30. The values of alpha for the 14 scales of the ESCI-HS ranged from .79 (Science, Teaching/Training, and Office Services scales) to .88 (Helping scale). The mean value of coefficient alphas was .83. All of the ESCI-HS scales are adequately reliable for research purposes (alphas > .70), yet three of the scales with alphas = .79 are strictly speaking not reliable for counseling purposes (alphas > .80). It is necessary for future investigations to examine the scales with non-college bound students to gather further data regarding the scales’ internal consistency values and possibly replace items of lower quality.

The other measures in the study showed adequate internal consistency values. Alpha values for the 14 10-item SIE scales ranged from .83 (Music and Arts scale) to .93 (Working with Computers scale), with a mean value of .88. The internal consistency reliability value for the total CDMSE-SF scale was .95.

As described in the Methodology section, all of the high school students’ responses were included in order to gather psychometric data regarding the measures. There are several possible explanations for the large percentage of youth who reported college bound plans. A researcher who was directly involved in STW interventions with urban youth for three years commented that the vocational behavior of students was less organized, planful, and introspective than the descriptions of individuals in other studies (Fouad, 1997, p. 410). She also added that the contextual forces of racism and poverty appear to interfere with effective vocational decision-making.

It is uncertain whether the 71% of Sample 2 who expressed college bound and post-bachelor degree plans will complete four-year degrees. It is possible that their reported plans were less organized and introspective as those reported by Fouad (1997). Furthermore, as
stated previously, Way and Rossmann (1996) reported that among high school seniors, males and racial minorities were less likely to report transition readiness than females and Caucasians. Lower levels of transition readiness suggested lower levels of vocational identity and higher levels of career indecision (p. 19).

It is also feasible that these students desired higher educational degrees than those achieved by their parents. Approximately 19% of students’ mothers reportedly completed a four-year college or graduate degree, and 13% of students’ fathers reportedly completed college or a graduate degree. Because of the wide disparity between the wages of workers with college degrees and workers without college degrees (Stevenson et al., 1998), these students may recognize the impact of additional education upon their income.

Furthermore, the educational and occupational aspirations of high school seniors are increasing across the United States. Stevenson et al. (1998) wrote, “In 1980, half of the seniors expected to be college graduates. By 1992, almost three-fourths of high school seniors expected to graduate from college almost a 50 percent increase above 1980. By 1992, very few students-less than 10 percent-did not expect to attend college” (p. 209). Furthermore, “Over 70 percent of high school seniors expect to be in professional, managerial, or proprietary positions” (p. 210). Thus, the reported plans of sample 2 could be considered as consistent with high school seniors’ aspirations in the United States, despite the fact that only one-fourth of the workforce has a college education (Stevenson et al., 1998). Regardless, it is necessary for future investigations to examine the properties of these measures with students who express work-bound plans in high school.

Next, intercorrelations among the 14 scales of the ESCI-HS were examined. As with Study 1, it was expected that the strongest correlations would be found between scales
of the same Holland theme. Nine out of the 14 scales correlated most strongly with another scale of the same theme. The remaining five scales were Mathematics, Science, Writing, Sales and Organizational Management, and Office Services. However, four of those five scales had their second strongest correlation with another scale of the same theme. In addition, there were strong correlations between the adjacent Realistic and Investigative themes and the adjacent Enterprising and Conventional themes among the five remaining scales. For example, the strongest correlations of the Mathematics and Science scales (Investigative) were to the Mechanical scale (Realistic). It is also of interest that the majority of ESCI-HS scales had strong intercorrelations ($r > .40$) with both adjacent and nonadjacent scales.

MANOVAs were performed to examine potential differences in confidence and interest levels between career center and traditional students. It was noted previously that career center students reported more work-bound plans (52%) than traditional students (12%). The analyses yielded nonsignificant effects. These findings were not surprising due to information gathered from high school personnel.

Specifically, a guidance counselor commented that there were relatively few differences between career center and traditional students. He approximated that of the career center students, 40% attend because they had a good experience the day they visited, 20% attend because of parental involvement, 20-30% attend because they have friends who are going, and the remaining percentage attends because of unidentified variables. Furthermore, he added that it is infrequent for students to attend a career center because they know want they want to do vocationally. However, he stated that students who complete a one or two-year program may become more focused regarding their vocational path, or at
least decide what areas they do not want to pursue. Thus, it is feasible that the differences in reported educational plans were due to the fact that students were more focused regarding their vocational path, as they were tested near the end of the school year and were close to completing their programs (personal communication, March 26th, 2003).

Another explanation regarding the larger percentage of work-bound plans among career center students involves coursework. Career center students are typically not exposed to college preparatory classes during regularly scheduled high school classes, thus limiting their opportunity to attend a four-year college (personal communication, May 30, 2003).

Next, the results revealed significant gender and race differences for the ESCI-HS scales. As with Study 1, gender differences were predicted in self-efficacy on the Realistic, Investigative, Enterprising, Social, and Conventional themes (Betz, Borgen, et al., p. 12-4; Betz & Gwilliam, 2002). Results were largely consistent with predictions, although no differences were found on the Enterprising and Conventional themes. Men reported significantly higher levels of confidence on three scales: Mechanical (Realistic), Outdoor/Physical (Realistic), and Mathematics (Investigative). Women reported significantly higher levels of confidence on two Social scales, Cultural Sensitivity and Helping. Effect sizes were largest for the Helping scale ($f = .64$), Outdoor/Physical scale ($f = .45$), and Mechanical scale ($f = .40$). Thus, gender differences were most evident on Social and Realistic themes. Overall, the gender differences provided evidence for the scale’s concurrent validity.

Other studies have reported more pronounced gender differences in terms of confidence levels for college students than employed adults (Betz et al., 1998; Betz et al.,
2003; Betz, Harmon et al., 1996). Findings from Study 2 suggest that the gender differences among high school students are similar to those reported by college students.

There were no predictions regarding race differences in confidence levels among high school students. The results revealed that African Americans reported higher levels of confidence on seven scales: Creative Production (Artistic), Writing (Artistic), Cultural Sensitivity (Social), Helping (Social), Teaching/Training (Social), Public Speaking and Leadership (Enterprising), and Sales and Organizational Management (Enterprising).

These findings are consistent with race differences reported between African American and Caucasian college students. In a study examining confidence levels with respect to the six Holland themes, the authors reported a relative lack of race differences, although African Americans reported greater levels of confidence than Caucasians on the Artistic, Social, and Enterprising dimensions (Betz & Gwilliam, 2002, p. 298). The lack of race differences on the Investigative scales is also consistent with previous research (Gwilliam & Betz, 2001). Furthermore, Betz and Gwilliam (2002) found that the discriminant validity of the confidence inventories in their study was questionable for African Americans. They commented, “whether this suggests that self-efficacy is a more generalized characteristic among African Americans than European Americans warrants further study” (p. 298). For Study 2, it is at least evident that African Americans have higher confidence on Artistic, Social, and Enterprising dimensions.

Additionally, within the SCI manual, high confidence is classified as 3.5 or above on a scale from 1-5 (Betz, Borgen et al., 1996, p. 24). In Study 2 African Americans reported high confidence levels on 9 out of the 14 scales, whereas Caucasians reported high confidence levels on 4 out of the 14 scales. These findings merit additional research
regarding confidence levels among African American and Caucasian high school students to
determine whether self-efficacy is a more generalized concept or if significantly higher
certainty among African Americans is limited to the Artistic, Social, and Enterprising
dimensions.

It is of particular importance that the scales on which lower confidence was reported
by African Americans (although still classified as within the moderate confidence range)
were Realistic and Investigative themes. It is unclear why African Americans reported
lower confidence levels on the Realistic scales, Nature/Agriculture, Mechanical, and
Outdoor/Physical, yet other authors have discussed this finding regarding the Investigative
theme (Fouad, 1995; Gwilliam & Betz, 2001). As described in the literature review, Fouad
(1995) designed an intervention to enhance math and science career awareness for Black and
Hispanic students, due to the fact that minorities are underrepresented in math and science
(Investigative) majors and careers. Fouad (1995) also noted that “math and science
preparation is becoming increasingly important for success in almost all professional career
areas” (p. 527).

For the 14 interest scales there were significant interactions on the Outdoor
Environment, Plants, and Animals (Realistic), Cultural Relations (Social), Helping Others
(Social), Teaching and Training (Social), and Business, Sales, and Marketing (Enterprising)
scales. As described previously, African American males and females reported higher
interest levels than Caucasian males and females on the Cultural Relations, Teaching and
Training, and Business, Sales, and Marketing scales. A univariate main effect for gender
was found on the Construction and Engineering scale (Realistic), with males reporting
higher levels of interest. Additionally, there were significant univariate main effects for race
on Working with Numbers (Investigative), Music and Arts (Artistic), Writing and Mass Communication (Artistic), Law and Politics (Enterprising), and Office and Project Management (Conventional). African Americans reported higher interest levels on those five interest scales. It is noteworthy that the seven scales on which African Americans reported higher confidence overlap considerably with the scales on which African Americans reported higher interest.

Next, differences between individuals who reported work-bound plans versus individuals who reported college bound plans were examined. Results were consistent with predictions that students who reported college bound plans would also report higher levels of confidence, providing additional evidence for the scale’s concurrent validity. Students with college bound plans reported higher levels of confidence on six ESCI-HIS scales: Writing (Artistic), Helping (Social), Teaching/Training (Social), Public Speaking and Leadership (Enterprising), Sales and Organizational Management (Enterprising), and Office Services (Conventional). Effect sizes were largest for Public Speaking and Leadership (f = .40), Helping (f = .37), and Sales and Organizational Management (f = .37).

Differences in interest levels between individuals with work-bound versus college bound plans were also examined. Individuals who reported college bound plans had significantly higher interest levels on eight scales: Working with Numbers (Investigative), Health and Science (Investigative), Writing and Mass Communication (Artistic), Cultural Relations (Social), Helping Others (Social), Teaching and Training (Social), Law and Politics (Enterprising), and Office and Project Management (Conventional). The largest effect size was for the Teaching/Training scale (f = .38).
It is noteworthy that the significantly higher interest levels overlapped with the significantly higher confidence levels reported by individuals with college bound plans. Specifically, higher interest levels were reported on five of the six scales for which higher confidence was reported. This suggests that high confidence and high interest may often accompany each other. It also makes theoretical sense that individuals who reported college bound plans had significantly higher interest levels on the Investigative scales, Working with Numbers and Health and Science. As noted previously, coursework in math and science classes is often prerequisite for professional career areas.

Next, the relationships of the confidence scales to the parallel Basic Interest Scales on the SIE were examined with Pearson-product moment correlations. It was expected that the strongest correlations would exist between parallel confidence and interest scales. Results indicated that 13 of the 14 confidence scales had the strongest correlations with their parallel interest scale. The only confidence scale that did not have the strongest correlation with its parallel interest scale was Public Speaking and Leadership. Instead, it correlated most strongly with the SIE Teaching and Training scale (Social). Although this correlation was not predicted, it makes substantive sense as leadership, teaching, and training activities may overlap.

The relationships between parallel confidence and interest measures ranged from .42 to .70. These results are consistent with correlations between confidence and interest levels reported in other studies. For example, Betz, Borgen, et al. (1996) reported skills confidence-interest correlations within Holland themes that ranged from .44 (Enterprising) to .63 (Artistic) (p. 15). Chartrand et al. (2002) reported correlations that ranged from the .40s to the high .60s between interests and self-efficacy as measured by the SII and SCI.
This suggests that although confidence and interest are distinct concepts, they are related. In other words, people who have high confidence in an area also tend to report interest in that area, yet high confidence does not necessitate interest in an area. Similarly, individuals may have high interest yet low confidence within an area.

In addition to the moderate to strong correlations between parallel confidence and interests scales, the majority of the correlations between confidence and interest scales within the same Holland theme were above $r = .40$. However, some unexpected correlations were also found. For several scales there was no difference in the strength of the correlations between adjacent and nonadjacent scales.

The patterns of high interest/high confidence and high interest/low confidence were calculated to determine the extent to which the inventories yield domains with potential for career exploration. The high interest/high confidence pattern was clearly a domain with potential for career exploration as shown by the frequency of this pattern. However, there were only seven instances in which high interest/low confidence was reported across the 14 parallel scales. Although other studies have also found that there are typically fewer frequencies of the high interest/low confidence pattern relative to other patterns (e.g., low interest/high confidence) (Betz, Borgen, et al., 1996, p. 17), this number was remarkably low. As noted in the Results section, means on the ESCI-HS scales ranged from 3.01 (Outdoor/Physical) to 4.09 (Helping) and the mean of the 14 scales was 3.53. The high means on these scales restricted the ability of the responses to fall into the high interest/low confidence quadrant. Additionally, as stated above, African Americans reported high confidence, according to the SCI manual (Betz, Borgen, et al., 1996), on 9 out of the 14
scales. It is noteworthy, however, that higher levels of interest were not commonly reported on the SIE scales, as the mean of these fourteen scales was 2.01.

Next, it was postulated that students who possessed one or more domains with high confidence and high interest would be more confident about their career decision-making skills. It was predicted that the more areas of possible exploration, the higher the CDMSE score. Results were consistent with predictions. As the number of high confidence/high interest domains increased, career decision-making confidence increased as well. Thus, the more options that students have for potential career exploration, the more confident they also are in their career decision-making skills.

The relationships between the six confidence scales and career decision self-efficacy were then studied through correlations and simultaneous regression analyses. The confidence scales (Mathematics, Science, Writing, Cultural Sensitivity, Public Speaking and Leadership, and Using Technology) accounted for 57% of the variance in career decision self-efficacy in the total high school sample. The Writing and Cultural Sensitivity scales were the only significant predictors in the regression. Furthermore, results indicated that the six confidence scales accounted for 62% of the variance in CDMSE among men and 56% of the variance in CDMSE among women. None of the individual scales contributed significantly to the regression for men or women. It is possible that the moderate intercorrelations among the majority of the scales ($r > .40$) limited the possibility that they could each contribute to the regression. The weakest correlation among the six scales was between Mathematics and Cultural Sensitivity ($r = .16$), and the strongest correlation among the six scales was between Writing and Public Speaking and Leadership ($r = .67$).
As stated previously, Paulsen and Betz (in press) performed similar analyses with six confidence scales on the ESCI; they argued that these factors can be considered as essential to the goals of a college education. In their study they found that six confidence scales on the ESCI accounted for 49% of the variance in career decision self-efficacy among college students. This finding is consistent with the result in Study 2 with high school students. The confidence scales clearly accounted for variance in career decision self-efficacy. However, Paulsen and Betz (in press) found that the ESCI Leadership scale was the largest predictor for the total group, men, women, African Americans, and Caucasians. They also reported that the ESCI Mathematics, Science, Writing, Cultural Sensitivity and Using Technology scales each contributed independent variance in CDMSE for the total sample. Study 2 found that only Writing and Cultural Sensitivity significantly predicted variance in career decision self-efficacy.

It is likely that the strong correlation between Writing and Public Speaking and Leadership \( r = .67 \) in Study 2 limited the possibility that Public Speaking and Leadership could also contribute significant variance to the equation. Yet is also makes theoretical sense that Writing was a significant predictor of career decision self-efficacy among high school students, as writing skills may be more basic to a high school education than public speaking and leadership skills. Overall, the large amount of variance in career decision self-efficacy accounted for by the six scales among high school students suggests that higher confidence in these dimensions, particularly Writing and Cultural Sensitivity, could be related to more adaptive career decision making skills.

Participants’ written responses regarding the influences upon their educational plans were classified into three broad categories, environmental, personal, and background, and
subcategories, based on a previous study (Paa & McWhirter, 2000). The most cited influences were family, followed by goals and interests.

Although the Paa and McWhirter (2000) study utilized a scale that measured perceived influences on current career expectations rather than an open-ended question, several results were consistent with the responses of Study 2. For example, Paa and McWhirter (2000) reported that the strongest environmental influence for girls was mothers and for boys was fathers. The present study did not find similar support for the strong influence of fathers, yet the influence of parents, mothers, and families in general was reported. Other studies previously discussed also highlighted the role of family upon career development variables (Ferry et al., 2000; Way & Rossmann, 1996).

Paa and McWhirter (2000) also reported that teachers were to some extent influential, although less influential than parents and same-sex friends. In Study 2 a larger percentage of students mentioned teachers, school, or the career center than friends. Additionally, both studies found that counselors were a weak environmental influence. Paa and McWhirter (2000) explained, “it might be that the relatively lower perceived influence of counselors (and male teachers) is associated with their low numbers in most secondary school settings” (p. 39). This finding, however, does not conflict with the influential role of guidance programming discussed in the literature review (Blustein et al., 2000; Gysbers, 1997; Lapan et al., 1997). The impact of comprehensive guidance programs infused throughout schools differs from the effect of individual guidance counselors.

Furthermore, Paa and McWhirter (2000) reported that the strongest personal influence for boys and girls was interests, and the strongest background influence for boys and girls was ability. The role of interests and ability was also mentioned in Study 2.
Additionally, the significance of goals as a personal influence was documented. Students frequently expressed the need to succeed and “be somebody”, perhaps due to encouragement and support from family members.

Finally, the intervention utilized the accumulating research supporting the utility of parallel confidence and interest measures in career development (Betz & Borgen, 1999). Written results were prepared for each high school student. As stated in the Methodology section, the classification system was conservative due to the new nature of the inventories and the alpha levels of three confidence scales.

5.3 Implications for research

The present studies investigated the properties of joint confidence and interest measures with respect to basic domains of vocational activity among high school students. Future research should replicate this study using a sample of students who express work-bound plans in high school to further examine the scales’ reliability and validity. This would provide a clearer picture of the utility of these measures with this population.

Additional research should also continue to examine the confidence scales’ validity with racial and ethnic minority groups, particularly African Americans. Gender differences with respect to the RIASEC themes have been well documented throughout the empirical literature (Betz, Borgen, et al., 1996; Betz, Harmon, et al., 1996; Betz & Gwilliam, 2002), yet it is also increasingly necessary to examine the psychometric quality of measures in minority groups (Fouad, 1993). Study 2 found that African Americans had significantly higher confidence levels on the Artistic, Social, and Enterprising scales. In addition, the relative lack of high interest/low confidence patterns is due to the high means on the confidence scales, which may be directly associated with the large percentage of African
Americans in Study 2. Thus, self-efficacy with respect to the Holland themes requires further investigation among African Americans.

The relationship between adjacent and nonadjacent confidence and interest scales is another area of potential investigation. For several scales in Study 2 there was no difference in the strength of the correlations between adjacent and nonadjacent scales. It is unclear whether this finding was an artifact of this particular sample or of high school students in general.

Future studies should also investigate the role of social class upon confidence and interest levels. A recent article found that socioeconomic status (SES) impacted the transitions of young adults (Blustein et al., 2002). For example, workers from high SES backgrounds were more likely to report personal satisfaction from work and greater availability of external educational resources than workers from low SES backgrounds. Thus, the impact of SES, in addition to race and gender, upon the career development processes of work-bound youth would be useful.

Another area of further investigation involves the educational plans of high school students. Fouad (1997) stated that the urban youth with whom she worked seemed less planful and organized than individuals reported in other studies, and Way and Rossmann (1996) reported that among high school seniors racial minorities and males were less likely to report transition readiness than Caucasians and females. However, as described in the literature review, other studies have found that a substantial proportion of high school graduates, regardless of race, encounter unemployment and instability (Blustein et al., 2000; Savickas, 1999). Future studies could further explore the increasing educational aspirations
of high school students (Stevenson et al., 1998) and the environmental, personal, and background factors that influence work-bound versus college bound students.

5.4 **Implications for counseling**

The joint use of confidence and interest measures could potentially have positive effects on the career development processes of work-bound youth. As described in the Literature Review, the utility of confidence and interest measures has been documented in adult and college samples (Betz et al., 1998; Chartrand et al., 2002; Donnay & Borgen, 1999; Isaacs et al., 1997; Lenox & Subich, 1994). Self-efficacy in general has been also applied within hundreds of studies to career-related behavior such as career decision self-efficacy (Luzzo, 1993) and career decision-making (Betz & Luzzo, 1996). Moreover, Multon et al. (1991) wrote about the importance of self-efficacy for high school students who are uncertain about their career direction and goals, Fouad (1995) discussed the influential role of self-efficacy for minorities and females, and Blustein et al. (2002) commented on the impact of psychological factors upon a successful STW transition. The impact of self-efficacy beliefs and outcome expectations on the development of interests in high school and college samples has also been documented within the broader framework of SCCT (Ferry et al., 2000; Fouad & Smith, 1996; Lent et al., 2001; Lopez et al., 1997).

Because counselors have means of increasing self-efficacy (e.g. performance accomplishments, verbal persuasion), joint use of confidence and interest measures could help students gain confidence in areas where they have high interest and thus expand vocational options.

First, as stated previously, the reliability of the confidence scales needs to be further examined for counseling use. Second, the patterns of confidence among African Americans
and other racial and ethnic groups needs to be examined so that appropriate counseling recommendations can be established. Third, Study 2 documented the importance of families upon educational plans. This finding was reported in the Literature Review (Ferry et al., 2000; Way & Rossmann, 1996). The Literature Review also discussed the role of comprehensive guidance programming (Blustein et al., 2000; Gysbers, 1997; Lapan et al., 1997). These findings suggest that counseling interventions should involve work-bound youth, families, and schools, which echoes recommendations from several authors (e.g., Fouad, 1997; Solberg et al., 2002). As Blustein et al. (1997) remarked, “The present findings suggest the importance of an active, dynamic, and purposeful stance on the part of all major players in the school to work transition” (p. 394).

5.5 Limitations of the studies

A principal limitation of Study 2 was the unexpected percentage of students who reported college bound plans. The large proportion of students with college bound plans restricts the application of the findings to all work-bound students. The difference in sample sizes between groups (e.g., African Americans versus Caucasians and work-bound students versus college bound students) was also a limitation.

Furthermore, causality cannot be inferred from the findings due to the correlational nature of the study. The administration of the measures was not counterbalanced, which may have also influenced the participants’ responses. Finally, the measures utilized were self-report and are susceptible to subjective interpretation of the participants and social desirability.
5.6 Summary

In spite of the limitations, a major contribution of the studies was the development of self-efficacy scales that parallel interest scales for high school students. Initial evidence for the reliability and validity of the scales was provided. The role of self-efficacy to career development, particularly the utility of the joint use of self-efficacy and interest measures, has been documented throughout the empirical literature (Betz & Borgen, 1999). The necessity of enhancing the STW transitions of high school students has also been reviewed. These studies expanded the use of parallel self-efficacy and interest scales to high school students, particularly non-college bound students.

Ideally, these scales will be used in research and eventually counseling to enhance the career development processes of work-bound students. The framework offered by comparing students’ levels of interests with their levels of confidence offers promise for enhancing the vocational choices of students. As Marshall and Tucker (2000) noted, school systems need to vigorously support adolescents in their career-related pursuits, especially the non-college bound youth, and treat them as a solution rather than a problem to economic difficulties. It is hoped that the present series of studies will encourage additional research in self-efficacy and interests with respect to basic domains of career activity among work-bound students.
LIST OF REFERENCES


APPENDIX A

SCRIPT FOR REP (PSYCHOLOGY 100) WEBSITE

Experiment: Confidence in Career and School Tasks.

Requirements: Fluency in English and first-year students are required.

Description: Participants will complete a demographic survey and a questionnaire regarding confidence in their ability to perform different tasks. The questionnaires will be administered in a pencil and paper format. This experiment is being conducted under the supervision of Dr. Nancy Betz.
APPENDIX B

WRITTEN SCRIPT BEFORE PARTICIPATION FOR PSYCHOLOGY 100 STUDENTS

Welcome to the study entitled Confidence in Career and School Tasks. The study number is ______. We are glad that you decided to participate in our study as part of the REP program. It is important to note that this study is being conducted under the supervision of a faculty member at Ohio State. If you are in the wrong room, feel free to leave now. At this time, we would like to verify who is present, in order for you to receive proper credit.

We would now like to begin the study. We would like each of you to fill out three questionnaires. If at any point you do not understand the directions, please raise your hand and we will come and assist you.

The questionnaires will take approximately 30-40 minutes to complete. When you are finished, please come up to the front of the room. We will provide you with information about the study before you leave. If at any time during the study you feel uncomfortable or unable to complete the questionnaires, you are free to leave. Your participation is voluntary, and you will not be deducted research hours or penalized for doing so.

Finally, we would like to remind you that your responses are completely confidential. No one will be able to identify your answers. Please keep in mind that it is important for each of you to respond as accurately and honestly as possible.

Does anyone have any questions?
APPENDIX C

DEBRIEFING STATEMENT GIVEN TO PSYCHOLOGY 100 RESEARCH PARTICIPANTS

Dear Students:

Thank you so much for participating in our experiment. We are interested in developing a confidence measure with respect to several different career domains. Specifically, we are creating a confidence measure for students in high school, who may or may not decide to continue their education. You have completed a preliminary questionnaire designed to tell us about your level of confidence for completing different tasks and school subjects. Please note that your responses do not indicate that your current level of confidence cannot or will not change.

What we hope to learn from this study is a way to better enhance high school students’ career exploration and planning. We believe that all students should be able to pursue an occupation that they will find satisfying and worthwhile. We also hope to use this information in counseling, so that people will be able to make better decisions about their career choices.

If in the course of this experiment, you have developed concerns or uncertainties about your career plans, you may wish to seek counseling. If you wish to do this, you may be able to find counseling in Townshend Hall at the Psychological Services Center (292-2059). In addition, The Ohio State University Counseling and Consultation Services Center offers both personal and career counseling and is open eight hours a day for appointments and, if needed, on an emergency basis. The number for these services is 292-5766. If you have any other questions about this study or would like additional counseling referrals, please contact Dr. Nancy Betz at 292-4166.

Again, thank you for assisting us with this research.
APPENDIX D

SKILLS CONFIDENCE INVENTORY

Instructions: For each activity or task listed below, indicate your degree of confidence in your ability to perform that activity or task. Use the following scale to indicate your confidence (no confidence, little, moderate confidence, much, complete confidence). Indicate the number corresponding to your confidence.

Items:
1. Act in a play
   (a) No confidence at all
   (b) Very little confidence
   (c) Moderate confidence
   (d) Much confidence
   (e) Complete confidence
2. Be elected to an office in an organization
3. Be in charge of ordering supplies for a hospital or large business
4. Comfort a patient experiencing severe pain
5. Develop a financial plan for your retirement
6. Work on commission, with pay based on the amount you sell
7. Do research work
8. Teach or tutor children
9. Express your ideas publicly
10. Conduct a financial audit
11. Talk someone out of suicide
12. Hike and camp in the wilderness
13. Design sets for a play
14. Keep financial records for an organization
15. Teach adults
16. Write a play or short story
17. Solve abstract puzzles
18. Meet new people
19. Repair a clock
20. Operate office machines
21. Organize systems for filing information
22. Perform a scientific experiment
23. Learn to perform basic auto maintenance
24. Express yourself artistically
25. Recognize famous pieces of music when you hear them
26. Learn to repair electrical wiring
27. Ride a horse
28. Run a political campaign for someone whose views you respect
29. Build a doll house
30. Sell a product to a customer
31. Solve anagrams and other word problems
32. Start a business
33. Take creative photographs
34. Play a musical instrument
35. Write a novel or autobiography
36. Help others solve their problems
37. Write up the results of a chemistry experiment
38. Study a difficult topic for several hours at a time
39. Counsel an unhappy couple
40. Recognize the works of a famous painter
41. Manage computer systems
42. Develop a marketing plan
43. Help a troubled teenager
44. Improve racial understanding
45. Lead other people
46. Prepare successful advertisements
47. Use a spreadsheet program on a computer
48. Hang wallpaper

Instructions: For each of the following subjects, indicate your present degree of confidence in your ability to complete the course successfully.

Items:
49. Accounting
50. Agriculture
51. Art
52. Astronomy
53. Calculus
54. Carpentry
55. Chemistry
56. Counseling methods
57. Finance
58. Industrial arts
59. Public speaking
60. Zoology
APPENDIX E

LETTER TO PARENTS OF HIGH SCHOOL STUDENTS

March 19, 2003

Dear Parents,

A research study involving junior and senior students at XX High School is going to be conducted on March 26th, 2003. This study is being performed by researchers at the Ohio State University.

The study asks students to complete four written questionnaires that take approximately 45 minutes to complete. The measures include questions about students’ career interests and their confidence in performing certain activities and school subjects. One goal of this study is to develop interest and confidence questionnaires to enhance students’ career exploration. Another goal of this study is to help youth make more meaningful and informed choices regarding their future employment settings.

Your child’s participation in this study is optional and voluntary. He/she may choose to participate in the study during his/her Block 2 period. A written description of the study will be read before the questionnaires are distributed. If your child does not choose to participate, he/she will not be penalized in any way. He/she will be asked to sit at his/her desk during the administration of the measures. If your child chooses to participate, he/she will be given the measures to complete during school. In addition, he/she will be entered into a raffle for twenty-five dollar gift certificates to local office supply stores and restaurants.

In addition, if your child chooses to participate, he/she can find out the general results of his/her responses. The investigator, named below, may meet with your child to discuss potential career areas for exploration during school hours. The investigator will also provide your child with the written results of his/her responses. Again, this portion of the study is entirely voluntary and optional.

Finally, your child’s responses, if he/she chooses to participate, will be kept confidential. This information will not be released to other students or school personnel.

If you have any questions or concerns regarding this study, please contact me at 614-292-4166.
Thank you,
Nancy Betz, Ph.D.
Primary Investigator

Jessica Lohr, M.A.
Investigator
APPENDIX F

WRITTEN SCRIPT BEFORE PARTICIPATION FOR HIGH SCHOOL STUDENTS

Good morning. My name is _______ and I am involved in the study this morning. The study that you are being asked to participate in is called Career Interests and Confidence Levels. It is important for you to know that a faculty member at The Ohio State University is carrying out this study.

In this study, the researchers would like each of you to fill out four different questionnaires. If you choose to participate, the questionnaires will take about 45 minutes to complete. If you finish and turn in the questionnaires, this means that you have agreed to participate in the study.

It is important to say that your participation is voluntary and optional. This means that you will not be penalized if you do not complete the questionnaires. If you choose not to participate, please sit quietly at your desks during the study. If you choose to participate and during the study you feel uncomfortable or unable to finish the questionnaires, you are free to stop and will not be penalized.

If you decide to answer the questionnaires, your name and your teacher’s name will be entered into a raffle. Twelve twenty-five dollar gift certificates will be given to students or teachers randomly chosen. Also, the general results of your responses will be available if you want them.

We are now ready to begin the study. If at any point you do not understand the directions, please raise your hand and I will come and help you. Please make sure to read the directions carefully before you answer the items. It is also important to answer the questions truthfully.

Finally, I would like to remind you that your responses are confidential. You and the researcher are the only people who will have access to your responses.

Does anyone have any questions?

Raise your hand if you are willing to complete the questionnaires.
APPENDIX G

DEBRIEFING STATEMENT GIVEN TO HIGH SCHOOL STUDENT PARTICIPANTS

March 26th, 2003

Dear Students:

Thank you for participating in our experiment. We are interested in helping high school students make better decisions about their future employment. Specifically, we are creating questionnaires for students in high school who may or may not decide to continue their education. Many past research studies have shown that a person’s interests are related to his/her future occupation. New research is also suggesting that a person’s confidence level in certain areas predicts what job he/she might pursue. You have completed questionnaires designed to tell us about your level of confidence for completing different tasks and school subjects and your current interests. Please note that your responses do not indicate that your current interests and levels of confidence cannot or will not change.

What we hope to learn from this study is a way to better enhance high school students’ career exploration and planning. We believe that all students should be able to pursue an occupation that they will find satisfying and worthwhile. We also hope to use this information in counseling so that people will be able to make better decisions about their career choices.

The investigator will return in two weeks. She will have the written results of your responses. You may also meet with her if you have questions regarding the study or your written results. It is hoped that this intervention will be helpful for students in their career development and planning.

I would like to remind you that your responses are completely confidential. Your names are required in order to identify your responses, if you desire to see a summary of your interest and confidence patterns. Your names will not be utilized for any other purpose.

If you have any other questions about this study or would like career counseling referrals, please contact Dr. Nancy Betz at 292-4166.
Again, thank you for assisting us with this research.

Nancy Betz, Ph.D.
Primary Investigator

Jessica Lohr, M.A.
Investigator
APPENDIX H

EXPANDED SKILLS CONFIDENCE INVENTORY-HIGH SCHOOL

Instructions: For each statement listed below, indicate how much confidence you have that you could accomplish each activity, task, or school subject. Use the following scale to indicate your level of confidence.

Items:
1. Fix things around the house
   (a) No confidence at all
   (b) Very little confidence
   (c) Moderate confidence
   (d) Much confidence
   (e) Complete confidence
2. Install drapery rods
3. Learn to repair electrical wiring
4. Learn to perform basic auto maintenance and repair
5. Hang wallpaper
6. Help build a house with Habitat for Humanity
7. Assemble an entertainment center
8. Successfully complete a course in industrial arts
9. Calculate the dollar savings for an item on sale
10. Determine the number of yards of carpet needed for a room
11. Solve math word problems
12. Reduce a recipe that serves 6 people to one that serves 2
13. Calculate how long it will take to drive between two cities at 65 mph
14. Compare the value of different size boxes of the same product at the grocery store
15. Solve algebraic equations
16. Calculate a shooting percentage in basketball
17. Understand the scientific basis of a medical breakthrough
18. Learn about the way a new medication works
19. Learn about the origins of the human species
20. Learn different constellations and planets in the solar system
21. Study the way the human mind works
22. Write up the results of a chemistry experiment
23. Pass a course in Biology
24. Read and understand science magazines
25. Edit photographs using a computer
26. Send attachments by email
27. Design websites
28. Use a spreadsheet or word processing program
29. Help a teacher with the class computers
30. Learn a new computer program
31. Set up a new personal computer
32. Troubleshoot problems on a computer
33. Create a new logo for a company
34. Develop new TV programs
35. Design new fashions
36. Design new sets for a play
37. Write a song
38. Start a band
39. Develop a clever TV commercial
40. Produce a music video
41. Write a book report
42. Help a friend put the finishing touches on an important class paper
43. Get an A or B on a term paper
44. Help edit the school yearbook
45. Write a movie review
46. Write a weekly column, for example on current events at school, for the school newspaper
47. Write a play or short story
48. Write a novel or autobiography
49. Coach a kids’ sports team
50. Lead a scout or Church group for kids
51. Teach on-the-job skills to a new employee where you work
52. Give good examples to explain a challenging topic
53. Help a classmate with course material
54. Simplify a complex explanation for beginners
55. Help a child learn to read
56. Teach or tutor children
57. Socialize with people from another culture
58. Learn about the histories of different ethnic groups in America
59. Understand religious differences
60. Help resolve conflicts between friends of different races
61. Learn more about the culture of neighbors who are immigrants
62. Plan a holiday party for people of different religions
63. Improve racial understanding
64. Help educate your family members about other races or religions
65. Work in a homeless shelter
66. Help a troubled friend
67. Serve as a mentor for a Big Brothers/Big Sisters program
68. Volunteer in a nursing home or hospital
69. Help friends talk about their relationship problems
70. Help others to solve their problems
71. Comfort someone experiencing a lot of pain
72. Talk a friend out of suicide
73. Speak at your class graduation
74. Give a talk in front of your class or team members
75. Participate in class discussions
76. Share your opinions at a student council meeting
77. Express your ideas publicly
78. Run for class president or vice president
79. Bring people with different viewpoints together to cooperate on a project
80. Convince others to follow your lead
81. Raise money for your club or team
82. Encourage others to donate money to a worthy cause
83. Work on commission, with pay based on the amount you sell
84. Sell a product to a customer
85. Help with a political campaign
86. Start a business
87. Manage a restaurant or clothing store
88. Manage other workers in a factory or office
89. Be in charge of banquet arrangements for a school prom, club, or team
90. Make copies on both sides of a page
91. Schedule a meeting of several friends or co-workers
92. Be in charge of ordering supplies for a hospital or large business
93. Organize systems for filing information
94. Develop a timeline to complete a project
95. Make a list of the tasks needed to complete a major project
96. Share work responsibilities with others
97. Complete a course in agriculture
98. Care for pets
99. Plant a garden
100. Raise livestock
101. Manage the landscaping for a city park
102. Work as a staff member at the city zoo
103. Identify different species of birds
104. Care for injured wildlife
105. Work as a forest ranger
106. Be a paramedic
107. Work as a police officer
108. Display physical endurance
109. Drive a large truck or tractor
110. Pass Basic Training in a military service
111. Work for the FBI
112. Hike and camp in the wilderness
APPENDIX I

CAREER DECISION SELF-EFFICACY SCALE

Instructions: Please read each of the following statements carefully and indicate how much confidence you have that you could accomplish each of the tasks.

Items:
1. Find information in the library about occupations you are interested in.
   (a) No confidence at all
   (b) Very little confidence
   (c) Moderate confidence
   (d) Much confidence
   (e) Complete confidence
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 considering.
7. Determine the steps you need to take to successfully complete your chosen major.
8. Persistently work at your major or 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 you would like to live.
23. Find information about graduate or 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 J

DEMOGRAPHIC QUESTIONNAIRE FOR HIGH SCHOOL PARTICIPANTS

1. Name
2. Age
3. Gender
   _____ male
   _____ female
4. Year in school
   _____ junior
   _____ senior
5. Race/Ethnicity
   _____ African-American
   _____ Asian-American
   _____ Caucasian (white)
   _____ Hispanic
   _____ Native American
   _____ Biracial (specify ________________________)
   _____ Other (specify ________________________)
6. After completing high school, what additional type of education, if any, do you expect that you will complete? Darken all circles that apply.
   _____ No plans to continue formal education after high school
   _____ 2-year community college program
   _____ 4-year or bachelor’s degree college program
   _____ ROTC program
   _____ Specialized training for less than 2 years (for example, beautician school or business school)
   _____ Apprenticeship program (for example, a program in plumbing or carpentry)
   _____ Advanced training through the military
   _____ Master’s degree
   _____ Professional graduate degree (for example, a PhD, a medical doctor, or a lawyer)
   _____ Other (specify ________________________)
7. What is the highest level of education achieved by each of your parents?
   For your mother or female guardian:
   _____ Some high school
   _____ Finished high school
   _____ Some trade school
Finished trade school
Some college
Finished college
Some graduate school
Finished graduate degree
Unsure/Does not apply

For your father or male guardian:
Some high school
Finished high school
Some trade school
Finished trade school
Some college
Finished college
Some graduate school
Finished graduate degree

8. What grades have you received during high school?
mostly As
mostly Bs
mostly Cs
mostly Ds
mostly Fs

9. If you had to choose a career right now, what would it be?

10. Are you currently working for pay?
yes
no

If yes, what jobs?

11. What has influenced your educational plans the most?