2010

An Exploratory Study of the Career Aspirations and Self-Perceptions of University Honors Program Students

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A dissertation

Presented to

The College of Graduate and Professional Studies

Department of Curriculum, Instruction, and Media Technology

Indiana State University

Terre Haute, Indiana

In Partial Fulfillment

of the Requirements for the Degree

Doctor of Philosophy

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by

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May 2010

Keywords: Gifted, Talented, Honors, Career, Self-Perception

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ABSTRACT

This study examined the career aspirations and self-perceptions of University Honors Program students at Indiana State University. The current trend in education, especially gifted and talented education, focuses on science, technology, engineering, and mathematics (STEM). How has this impacted the gifted and talented population when they become young adults ready to pursue college and careers? Are the interests and skills of University Honors Program students aligned with the majors they have chosen? What are their interests and skills?

The research was conducted on the campus of Indiana State University. This is a public higher education campus whose University Honors Program has about 500 members. The sample consisted of 20 University Honors Students. Each participant was asked to complete the *Self-Directed Search Assessment Booklet: A Guide to Educational and Career Planning* (4th ed.). This instrument, created by Holland, is used to assist in career planning. A three letter code resulted from the *Self-Directed Search* (4th ed.) (Psychological Assessment Resources [PAR], 2004).

The results of the study revealed a variety of majors, although STEM majors were the most prevalent. One identical match between the three letter career aspiration codes and the codes developed from the survey. However, three participants' codes included the same three letters in different combinations and eleven participants had an acceptable match of two of the three letters. Five students had only one common occupational letter. Multipotentiality and

Millennial characteristics were examined. The University Honors Program sample had strong Investigative and Social scores.

PREFACE

The research explored was prompted by the many students I have taught, my experiences in gifted and talented education, and the experience of mothering gifted and talented children. For a more equitable society, this research serves to investigate the outcomes of gifted and talented education manifested in higher education, especially in career aspirations. It is a salute to those who, regardless of educational background, have been true to themselves and followed their dreams.

ACKNOWLEDGMENTS

The hard work leading to the completion of a dissertation is not done alone. This work is no exception, and was encouraged and guided by an astute committee with unique expertise.

Dr. Susan Kiger, thank you for serving as Committee Chair. Your leadership has been dynamic and encouraging. I greatly appreciate your investment.

Dr. Noble Corey, I am proud to say that you have implemented a strong desire to investigate my work with a critical eye, so that my efforts can become the best they can be. The revelation of a polished work is without question a satisfying experience.

Dr. Scott Davis, it has been a pleasure to engage in theoretical discussions under your guidance and build my person from the core out. Your discussion approach to courses draws students in cognitively and affectively.

Dr. Maurice Miller, thank you for prompting me to throw "the box" away or "play with it." You have ignited my passion for research. I intend to fuel this passion.

Mark Howell and Rich Wathen, your encouragement was greatly appreciated. Thank you is not enough…but thank you. Coffee and Scrabble were relaxing breaks.

Chris, Marvin, and Mitchell, thank you for allowing me to grow as a scholar and fulfill my dreams while being a wife and mother. Your gifts and talents have kept me smiling. Mom, thank you for keeping us in line. I love you all.

Dad, you have taught me that being between a rock and a hard place means I'm between the peaks and, with enough willpower, will be standing on top of the mountain soon. Never doubt that you made me stronger through the adversity. It was you who first inspired me.

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CHAPTER 1

Introduction

Gifted education for children in the United States emerged over a century ago. Using a narrow, largely quantitative definition of gifted, these programs were very limited in their focus. The theories that drove the curriculum, lack of national cohesiveness, and the absence of a consensus of practice made this area of education somewhat mysterious.

Over time, the work of advocates led to the formation of associations and committees whose purpose was to enhance the inclusion and experiences of gifted and talented students. The federal government, prompted by educators and advocates, has become more involved over time. Today, one can even locate a definition of the gifted and talented through the U.S. Department of Education (2008) *Federal Register*. That definition is:

> Pursuant to section 9101(22) of the Elementary and Secondary Education Act of 1965, as amended by the No Child Left Behind Act of 2001 (ESEA), for purposes of the Jacob K. Javits Gifted and Talented Students Education Program, gifted and talented students are students who give evidence of high achievement capability in areas such as intellectual, creative, artistic, or leadership capacity, or in specific academic fields, and who need services or activities not ordinarily provided by the school in order to fully develop those capabilities. (p. 21330)

In conjunction with world events, a strong focus on science, technology, engineering, and mathematics (STEM) has compounded the newer face of identification processes. The urge to stay competitive in a world market has created tremendous pressure to increase standards for elementary, middle, and high school education. This is especially true of science, technology, engineering, and mathematics related curriculum. The surfacing of numerous grants, many of which include large sums of money, has erupted to grow the STEM effort.

Programs such as the University Honors Program allow students to collaborate with other gifted and talented students in higher education. The Honors Program at Indiana State University is set up to serve majors from every discipline. Are gifted and talented students who leave high school and enter higher education programs for high achievers following the STEM focus? What are their interests, skills and abilities?

Statement of the Problem

The roots of public gifted and talented education began in the late 19th century and early 20th century with scholars like Galton. Galton noticed the range of cognitive abilities in people, and sought to create operational criteria by which to base membership or exclusion into the gifted and talented arena (Belanger & Gagné, 2006). Work completed by Terman and Hollingsworth helped get America ready to infuse the public education system with more formal programs aimed to get our country in the space race (as cited in Gresham, 2008). Identification of methods to assess giftedness became the work of many scholars. Many such devices have since come forth. The Stanford-Binet test became a trusted assessment of American talent identification in the 1960s.

Children identified as gifted and talented in the 20th century were frequently studied by university scholars, such as Dr. Julian C. Stanley. Stanley focused on using tests that were

designed for students who were much older. He favored this approach to see where to begin instruction for profoundly gifted students (as cited in Lee, Matthews, & Olszewski-Kubilius, 2008).

It occurred to many scholars that the *snapshot* method was not the most accurate, since any number of variables could affect the outcome. Scholars such as Clark (2002) and VanTassel-Baska (1998) began to speak up through their teaching, research, publications and involvement in gifted and talented organizations. In light of this, many programs began using multiple criteria to recommend students to gifted and talented programs. Characteristic rubrics and informal guidelines became a way to guide educators in identifying students who may be academically exceptional.

In a science, technology, engineering, and mathematics (STEM) focused paradigm, there may be danger in disregarding the individuality of students in favor of the needs of society. The realization that children are entrenched in testing and curricula tailored to government standards can be simultaneously comforting and alarming. Is it possible that students, gifted and talented in particular, are being funneled into careers that serve the competitive, politically charged environment, instead of being guided and counseled based upon their interests and talents?

According to the National Association for Gifted Children (2009), there are currently around three million students who have been identified as gifted and talented in the United States. What will these three million individuals do when they complete high school? Do those who enroll in the University Honors Program at Indiana State University match their interests, activities and competencies with their career aspirations?

Purpose of the Study

This study investigated the career aspirations and self-perceptions of University Honors Program students. The following overarching questions served to guide this study:

1. Do the career aspirations of University Honors Program students match their self-perceptions Summary Code?
2. What category of activities do University Honors Program students like?
3. What category of competencies do University Honors Program students have most?
4. What occupations interest or appeal to University Honors Program students?
5. How do University Honors Program students rate themselves compared with other persons their own age in abilities and skills?

Subquestions were explored under questions 2 through 5. For each question, the overall population was studied as well as any differences between male and female University Honors Program students.

Need for the Study

Studies have been conducted in many areas of gifted and talented education. As a result, research has become more focused on the nuances that occur in such programs. Most of these studies, however, are focused on gifted and talented students while they are in elementary, middle, and high school programs. One recent study completed by The National Research Center on the Gifted and Talented explored the social and emotional implications of participating in accelerated college-credit courses while in high school. The results demonstrated that students feel their class choices and activities are limited. Lack of sleep was a common problem for these adolescents (Foust, Hertberg-Davis, & Callahan, 2009).

Although there have been a few extant studies that have interviewed small populations of tracked gifted and talented students into adulthood, there is still abundant data that needs to be gathered regarding the end results of the gifted and talented programs in the United States. The measurement of job satisfaction among a very minute group of gifted and talented adults revealed their current career satisfaction, but not why and when they decided upon their present careers. Are these individuals using their interests and abilities? The very fact that multi-potentiality exists serves to heighten the value of this research, since educators, counselors, parents, and most of all students, need to be aware that career choice should be linked to personal satisfaction and fulfillment. Investigation of the recent STEM focus should be conducted, especially on gifted and talented students, whose call to service has been sounded since the days of Sputnik. There needs to be more definitive data on the outcomes of gifted programs; are the calls being answered according to potential *and* interests?

Significance of the Research

The educational paradigm is ever changing. However, best practices continue to help scholars and educators make informed decisions. The field of education, and specifically gifted and talented education, needs data that builds the case for differentiated instruction. How can it be rationalized that differentiation is providing an environment that enhances special aptitudes and talents if we are not seeking to explore the post secondary worlds of gifted and talented persons? This study may reveal relationships that enhance our understanding of how the current gifted and talented programs are shaping today's youth into their adulthood. By knowing the career aspirations of gifted and talented students and their self-perceptions, phenomena related to the STEM focus may become more evident.

In a country whose educational climate is considered both dictated and free, this is a worthy exploration. The importance of personal actualization through a rewarding career based on the interests and talents of an individual should be maintained.

Definition of Terms

Career refers to a profession, such as teacher, designer, or doctor.

Gifted and Talented refers to an individual who has shown capability of high achievement in one or more of the following areas: intellectual, artistic, creative, leadership. These students are considered as part of special education and need programs to meet their exceptional needs as part of their school services (U.S. Department of Education, 2008).

Assumptions

It was assumed that the *Self-Directed Search Assessment Booklet: A Guide to Educational and Career Planning* (4th ed.) (PAR, 2004) accurately assesses the career aspirations and self-perceptions of students enrolled in the University Honors Program. It was also assumed that the *Occupations Finder* correlates with the *Self-Directed Search (SDS)*. It is assumed that the participants were honest in their responses and that they thoughtfully responded to the items in the SDS survey.

Limitations

This study was limited to the students who were enrolled in the University Honors Program at Indiana State University. These participants had completed the SAT or ACT with above average results, and/or fulfilled other criteria indicative of giftedness, such as a cumulative high school GPA of 3.7 or higher. This population is being classified as gifted, and will be referred to as such for the study. Generalizability to other gifted and talented populations may be limited due to the aforementioned criteria specific to Indiana State University.

Delimitations

While there are many aspects of gifted and talented education that need explored, the career aspirations and self-perceptions of those who are participating in University Honors Programs have been selected for this research. Largely unstudied, adults who have gone through gifted and talented education programs or possess gifted and talented characteristics as children may have unique career aspirations and self-perceptions. Some of these may relate to the curriculum emphasis on STEM education. University Honors Program students will be the focus of this study.

These participants are already enrolled in a major and have completed some form of assessment indicative of being gifted academically. They are enrolled in majors as adults, with the right to discontinue their current educational path if they so choose. Attending college is not mandated by local, state, or federal governments.

CHAPTER 2

Review of the Literature

Educational services for various populations have long been an area of both pride and dissonance in the United States. Services for the blind, deaf, and those learning English for the first time are included in special learning populations. Students who are identified as gifted and talented may also be involved in unique educational services. The review of the literature is divided into seven sections. The first section describes the history and roots of the gifted and talented initiative. The second section discusses the identification of the gifted and talented population. Presented next is a look at five curriculum philosophies and paradigms that have shaped gifted and talented education. The science, technology, engineering, and mathematics (STEM) initiative is examined, especially as it relates to gifted and talented programs. Counseling challenges for gifted and talented individuals is discussed next. Career development of gifted and talented students and career development of this population follow. Finally, the Self-Directed Search, a valuable tool based on career theory, is presented.

History of Gifted and Talented Programs

Throughout history there have been noted scholars. Early in recorded history, giftedness was mined world-wide. While the arts were appreciated in many parts of the world, this appreciation would come later in United States educational history.

The first gifted and talented programs in the United States focused on mathematics, reasoning, memory, and excelled skills in reading and comprehension. During the late 19th century, attention was directed to those whose superior early cognitive abilities were observed. Intellectuals began to confer and discuss the best ways to address educating these young people. As the Superintendent of schools in St. Louis in 1868, William Torrey Harris was a pioneer in public education for the gifted. He worked to implement a system within the schools to address the unique processing abilities of gifted students. Research completed by Francis Galton produced *Hereditary Genius* in 1869, a work that looked at the relationship of heredity and natural selection in gifted individuals (as cited in National Association for Gifted Children, 2009). A handful of schools opened their doors with an endeavor to meet the needs of gifted students between 1883 and 1899. Among them were the Cook County Normal School, the Horace Mann School, and the Speyer School (Rinn & Plucker, 2004). Literature continued to emerge with a focus on understanding the origins of giftedness, its identification, and how to address it.

Gifted education in the early 20th century was characterized by the work of Binet and Simon, whose seminal work in identifying gifted learners led to the creation of the Binet-Simon intelligence tests. These tests made mental age a numerical value. Henry Goddard soon studied with these researchers to determine the value of the new instruments. Enthusiastic, he translated and brought the new measurements to the United States (as cited in National Association for Gifted Children, 2009). It was in 1916 when Terman officially published the measurements for such tests that the door to education of gifted and talented students in the United States unlatched. Terman was captured by the psychological sciences and interested in the implications for education. He campaigned for the identification of gifted students using the new intelligence

tests. Terman was outspoken in his science-based approach. “Educational evangelism may be all right in its place, but it is a poor substitute for science in the search for truth” (Terman, 1928, p. 371). As research emerged that utilized these techniques, support in the form of grants surfaced. Universities, excited by the growing fields of psychology and education, also participated in the research (Jolly & Kettler, 2008).

Another pioneer in gifted education was Lulu Stedman, a faculty member at the Los Angeles State Normal School in 1918. Stedman’s work in creating an *opportunity room* was revolutionary and allowed her to observe and work with gifted students. Ten students were selected initially, based on IQ scores from the Stanford-Binet Assessment. She wanted to establish an environment where gifted children could learn and develop their talents. While not deciding on static criteria for giftedness, Stedman wrote about her experiences with vigor and insight (as cited in Jolly, 2005).

Hollingsworth’s interest in gifted education led to a movement of organization and definition. She advocated for criteria that would help make the field more valid in the eyes of other researchers. Her study of *Child E* led her to reveal informative works. Her identification of behaviors and criteria including a minimum IQ of 130 made the field more grounded (as cited in Jolly, 2005).

Growth of the gifted education field slowed with the economy of the Great Depression. Basic needs and war captured the attention of the public. However, the world was soon to be enveloped in the excitement of the race to put a man in space. Sputnik’s launch by the Soviet Union created fear and national concern for the United States’ well being (Marshall, Sears, Allen, Roberts, & Schubert, 2007). In fact, the government launched a talent search for gifted students who, by their intellect, were believed to be the hope of the United States’ future. The

National Defense Education Act of 1958 allowed government resources to aid in the development of intellectual talent (Jolly & Kettler, 2008). This funding went to many gifted students, mostly in science and mathematics, who were not able to financially cover the cost of higher education (Jolly, 2009).

At Johns Hopkins University, Stanley addressed the ceiling effect in 1969 by giving students above-level tests. In this way, he began the talent search model in gifted education. He addressed this initially with a 13-year old gifted freshman. Stanley's methods created ways to identify areas of need and giftedness in individuals of high ability. His goal was requisite in the move toward the individualization of gifted education (Swiatek, 2007).

As with most educational practices, the pendulum swings. The late 1970s brought a more relaxed view of education. Methods that were considered *lax* by fundamentalists and classical educators emerged. Especially in gifted education, free exploration was often conducted with the thought that students would naturally learn and expand their talents. Creativity was important to the field. The Office of the Gifted and Talented located in the U.S. Office of Education was finally given official status in 1974 (National Association for Gifted Children, 2009). Near the end of the 1970s, curriculum workers' alarms sounded. They called for more structure and a back to basics approach (Marshall et al., 2007).

A growing literature base for gifted and talented stakeholders was emerging as a result of neuroscience, behaviorism, and cognitive studies revealing their findings. For example, Clark's (2002) *Growing Up Gifted* held value for educators, parents, and gifted students. This book made a mysterious field much more visible and was based on data and observations she had collected.

Additionally, significant publications by educators Witty (1971), VanTassel-Baska and Little (2003), Tomlinson (1996), and Renzulli and Reis (2002) were instrumental in addressing curriculum for gifted and talented education as time went on. With frugal guidance in this area, schools had little resources to serve gifted and talented students in general education classrooms. While their approaches and philosophies differed, the common strand of differentiating the curriculum was an important step.

The Reagan administration again put a governmental focus on education. Initiatives to improve educational practices with students began with the development of tangible standards in education. Federal research funding for gifted education was finalized in 1988 when Congress passed the Jacob Javits Gifted and Talented Students Education Act. The official recognition of the Office of the Gifted and Talented along with the aforementioned legislation made it possible for curriculum workers and educators in gifted education to expand their knowledge and research (National Association for Gifted Children, 2009).

A few key occurrences of the 1990s include The Case for Developing America's Talent and the National Association for Gifted Children's release of Pre-K-Grade 12 Gifted Program Standards. The formerly mentioned report, released in 1993, revealed how gifted and talented children were being neglected. Recommendations for improvement were considered (as cited in Jolly & Kettler, 2008). The National Association for Gifted Children's guidance for practitioners was crucial in the rehabilitation of gifted and talented programs at the end of the 21st century (National Association for Gifted Children, 2009).

The No Child Left Behind Act in 2002 created excitement among those in gifted and talented education, especially since the Javits program would be offering more grants. Additionally, a new definition of gifted and talented was revealed (National Association for

Gifted and Talented, 2009). However, it soon became evident that many in the field would realize that in numerous instances, the education of the gifted and talented was being *left behind* to boost underachieving students. Pressure from federal, state, and local governments focused in on student achievement tests and had a crushing impact on many gifted and talented programs (Golden, 2003).

Today the field of gifted and talented education continues to strive toward a consensus of terminology and criteria for inclusion, despite some initiatives. The bumpy history of the field has been spurned by dissonance among those in the public and private sectors. Some cry for more funding and attention to the gifted and talented while others usurp that the high-achieving students require less funding due to their exceptionality. The inclusion of gifted *and* talented students has been a shift in values. This shift includes the findings of Torrance's work on creativity and its actualization. His studies have provided an excellent case for creative development (Torrance, 1980; Torrance & Safter, 1999). Even still, many programs are more focused on STEM standards than talents in other areas.

Identification

Who is gifted and talented? How do we know? It must be addressed promptly and bluntly. The definitions, instruments, inclusionary criteria, and even individual characteristics of the gifted and talented field are inconsistent. Across many texts and studies, the suggestions and references vary.

One area of consensus is the frustration with the lack of uniformity including the name for the field. The most widely accepted term is gifted and talented (G. T.). However, other names such as academically talented, gifted, and high ability are wide-spread. Word choice aside, most researchers and educators agree that giftedness is norm referenced. The IQ of a

moderately gifted child is between 130 and 150, while the profoundly gifted children possess an average of 180 (Fahlman, 2000). A discussion of several gifted and talented evaluations are available (Ford, 2004). Gifted children are identified after taking one of these tests.

When these tests are not readily available or used in some districts, lists of characteristics of gifted and talented students can be located for educators and parents to reference. According to research, common characteristics seem to accompany giftedness (Yoo & Moon, 2006). One such list of descriptors can be found in Winebrenner's (2001) *Teaching Gifted Kids in the Regular Classroom*. She lists 23 characteristics that educators may observe in children. Gifted children may exhibit some or all of the following: extremely precocious, exhibits asynchronous development, advanced vocabulary and verbal ability, outstanding memory, can learn things easily, has a higher level of thinking than same-age peers, ability to work with abstract ideas, understands cause and effect, sees connections others do not, suggests new and *better* ways of doing things, prefers complex tasks, transfers knowledge to other areas, enjoys sharing knowledge, is curious, an avid observer, an intense person, may have many unusual interests, loves to work on things independently, high energy level, sensitive, sophisticated humor, sense of justice and empathy, and leadership. Another list in the text by Winebrenner suggests 15 challenging characteristics that some gifted children may exhibit before identification occurs, including: resists work or completes it carelessly, frustration with the pace, rebellious behavior, demanding *why*, resists order, daydreams, dominates class discussions, becomes bossy, is intolerant of imperfection, cries easily, nonconformist, resistant to group work, acts out, is a *class clown*, and impatient.

Other authors suggest many of the same characteristics, and even extend the list. For example, in *Actualization of Giftedness: Effects of Perceptions in Gifted Adolescents*, Fahlman

gives a description of gifted children that includes obsessive interests, metacognitive awareness, and internal locus control (as cited in Griggs & Dunn, 1991; Piirto, 1999; Rogers, 1986). Meanwhile, authors of the advocacy group The Gifted in Fremont (T.G.I.F) further expand gifted and talented individuals as not only the top 2-3% of students on IQ tests, but also as possibly possessing outstanding creativity and skill in visual and performing arts (Frequently Asked Questions About GATE, 2006). While usually perceived as positive, one can see why giftedness might be a double-edged sword since being unique can be an asset or a liability (Robinson, 1997). Some are talented in several areas, sometimes creating great need for extension experiences well beyond their peers in several areas (Renzulli, 1990; Roberts & Inman, 2007; Rysiew, Shore, & Leeb, 1999).

If teacher observations indicate giftedness, often educators will refer to their district coordinator for advice and testing for the student. If a coordinator is unavailable, references that help describe the characteristics of those who need differentiated curriculum can be located (Roberts & Inman, 2007). Testing usually follows teacher, and sometimes parental, recommendations for gifted and talented education. If students *pass* the norm-referenced tests they are usually included in the program. The Vigo County School Corporation (2009) designates that:

> Children and youth with outstanding abilities that perform or show the potential for performing at remarkably high levels of accomplishment when compared with others of their age, experience, or environment may be identified for placement in the Gifted and Talented Program of the Vigo County School Corporation. These children and youth exhibit high performance capability in intellectual, creative, and/or artistic areas, possesses an unusual leadership capacity, or excel in specific academic fields. (p. 1)

In essence, gifted and talented children can take on a wide variety of characteristics, perceived as both positive and/or challenging. The IQ usually required to participate in gifted and talented programs is now arbitrarily set at 130 or higher. In some locations, programs for the profoundly gifted and talented are available. The field itself now demands that some other criteria be taken into account since many IQ tests are culturally biased. Checklists and simple rubrics are available to assist educators. Additionally, more culturally unbiased assessments are available.

Curriculum Philosophies and Paradigms

Most scholars agree that curriculum for the gifted and talented should be implemented for the gain of participants. However, many curriculum paradigms exist, making it difficult for state and local education departments to decide which one to use with gifted and talented students. Well-known researchers and scholars are associated with each paradigm. While VanTassel-Baska and Little (2003) examined five such paradigms, seven were looked at in this review.

The Traditionalist curriculum paradigm is influenced by Adler and his belief that quality readings and discussions of ideas and themes allow the world to be knowable. This philosophy was unveiled by Adler in 1982 (as cited in VanTassel-Baska & Little, 2003). VanTassel-Baska and Little's (2003) Integrated Curriculum Model (ICM) is based on this philosophy and was first presented in 1986. Development of the model was dependant on the key factors identified in curriculum reform (VanTassel-Baska & Little, 2003).

Banks' 1975 work in education focused on equity and encouraged the Social Reconstructionist curricular paradigm. Impacting social order through education was the goal by allowing access to knowledge for all participants. Banks believed that reality was a socially constructed phenomenon, and therefore changeable. Ford's Multicultural Curriculum Model

emerged from this philosophy. This philosophy of curriculum boosts attention to diverse learners from the minority perspective and the social action position (as cited in Ford, 2000).

Vygotsky's work, particularly in psychology, prompted the cognitive constructivist paradigm. The zone of proximal development was the area where teachers could scaffold their students through cooperative learning experiences. Renzulli built off of this philosophy to create the Enrichment Triad Model. By engaging the learners in experiences while applying key concepts, students' individual realities would grow (Renzulli, Reis, & Sally, 1994).

Skinner, well known to the field of psychology during the 20th century, was a contributor in the Behavioristic Positivism approach that Stanley used to create his D-P Model of Acceleration. The scientific method and the assessment of leaning are essential. Verification of learning through observable behavior is crucial in this model. In particular, this method involves a focus on relevant academic enrichment (Stanley, 1979).

On the other hand, Postpositivism was encouraged by Howard Gardner's work. In 1983, Gardner's studies helped emphasize teaching for understanding, an approach that would focus on the individual learner. Schemas and scaffolds were the way to reach students of varying ability and backgrounds. The interaction of a person in a specific context was meaningful (as cited in VanTassel-Baska & Little, 2003).

While VanTassel-Baska and Little (2003) reveal five curriculum models for analysis, it is important to note that The National Research Center on the Gifted and Talented is currently leading research using Kaplan's Depth and Complexity Model and the Schoolwide Enrichment Model from Renzulli et al.'s (1994) work. These models also have merit and are being investigated to see their impact upon student development.

With great influence from Tomlinson, Kaplan's Depth and Complexity Model has a focus on the learner as the center, with the curriculum and instruction flexible (Tomlinson, 2005). This paradigm includes application of Vygotsky's work with scaffolding learners in the zone of proximal development (as cited in Kanevsky & Geake, 2004). Valuable and rich learning experiences through differentiated participation are most important in this model.

Renzulli and Reis (2002), both known for their scope of knowledge, pooled their scholarship to form the Schoolwide Enrichment Model. This allows for an individual building or system to develop a quality plan that serves students, including those who are gifted and talented, in a relevant and appropriate way. Learning styles are taken into account and interests are developed in this model (VanTassel-Baska & Brown, 2007).

Since the curriculum philosophies have several reputable scholars backing them and the curriculum paradigms all have research based approaches, it is difficult to choose a program within a paradigm to utilize with gifted and talented children. The implementation of various programs, due to their various centralities, will have differing student results. Table 1 illustrates the diversity in the models.

Table 1

Curriculum Paradigms

Curriculum Model	Paradigm	Author
Integrated Curriculum Model	Traditionalism	Joyce VanTassel-Baska
Stanley's D-P Model of Acceleration	Behavioristic Positivism	Stanley
Ford's Multicultural Curriculum Model	Social Reconstructionist	Donna Ford
Gardner's Teaching for Understanding	Postpositivist	Howard Gardner
Depth and Complexity Model	Traditionalism	Sandra N. Kaplan (influenced by Carol Ann Tomlinson)
Schoolwide Enrichment Model	Cognitive Constructivist	Joseph S. Renzulli, Sally M. Reis
Cognitive Enrichment Triad	Cognitive Constructivist	Joseph S. Renzulli

A practical approach to programming is given by Robinson, Shore, and Enersen (2007) in *Best Practices in Gifted Education: An Evidence-Based Guide*. Being cognizant of the real-world issues that gifted and talented educators, parents, and students face is the best approach. Therefore, an appropriate gifted and talented program in one school or district may look different than one in another school or district. Scholars and advocates in the field of gifted and talented education suggest the following considerations for programs: "degree and extent of gifts and talents, socioeconomic makeup, gender, special talent consideration, emotional health, and disabilities" (p. 19).

The air of gifted and talented education continues to be an array of local definitions and stereotypical nuances, although it is clearer than ever before. The variance between programs is

more similar in that there are now a set of national standards for the education of gifted and talented students, along with a definition of what these programs should look like. The primacy of this effect can be seen in the focus on STEM education within even the most progressive school districts.

STEM Focus

There can be no doubt that the focus of curriculum has been growing toward science, technology, engineering, and mathematics education, even becoming widely recognized simply as STEM curriculum. While STEM efforts were evident in early United States gifted and talented education and identification, Sputnik's launch really solidified it. While progressive educators have fought for inclusion of more gifts and talents and have succeeded, at least as far as identification language, the focus in education has grown toward STEM curriculum and instruction that attracts attention and funding. The Academic Competitiveness Council has been created to keep the United States moving toward STEM goals in correlation with the Deficit Reduction Act of 2005 (U.S. Department of Education, 2007). This tension has been building since the inception of the National Defense Education Act in 1958 (as cited in Jolly, 2009).

A press release from the U.S. Department of Education reveals that STEM initiatives are linked to governmental desire to be competitive with others nations in STEM fields. The executive summary for the Report of the Academic Competitiveness Council being referred to was released in May 2007.

> Officials from federal agencies with education programs aimed at improving America's competitiveness in science, technology, engineering, and mathematics (STEM) engaged in a yearlong endeavor to assess their programs' success and to identify areas for improvement for current and future programs. This effort, carried out by the Academic

> Competitiveness Council (ACC) and led by Secretary of Education Margaret Spellings, lays the groundwork for sustained collaboration among STEM education programs across federal agencies that will greatly strengthen America's competitiveness. (Spellings, 2007, ¶ 1).

It was noted that some of the programs found to be exemplary obtained publication for their STEM work. Recognition for such work is often given to STEM participants and advocates.

In fact, there is a great deal of funding available to educators and schools who wish to enhance and promote STEM education in public schools. The Jacob K. Javits Gifted and Talented Education Program lists several abstracts for new awards. The money available is in the hundreds of thousands of dollars for many grants. For example, one grant targeting elementary school students was valued at $434, 574 (Year One). A look at the abstract quickly attests to its focus. "The overarching goals of Project Parallax are to provide innovative Science, Technology, Engineering, and Mathematics (STEM)-focused services to, and to increase the identification of, gifted elementary students from under-represented groups using challenging Problem-Based Learning (PBL)" (U.S. Department of Education, 2008). Other grants with STEM focuses include Project STEM and Project GEMS. Other sources of funding include local organizations and donors. Not satisfied, U.S. Secretary of Education Arne Duncan encouraged even more support and funding for STEM programs. He connected the success of such programs to the success of the country (U.S. Department of Education, 2009).

It is important to note that STEM study and passion is a positive aspect of a balanced education. It is balance that is missing in many educational climates. The STEM focus has come at a loss to the artistic atmosphere of many gifted and talented classrooms. The demand for more time and attention to STEM projects and instruction has decreased the amount of time

students can spend in other activities. Those with outstanding artistic talent are lucky if they have access to programs that support their talents (Scott, 1988). It is important to keep in mind that in many gifted and talented programs, non-STEM interests, such as the creative arts and literacy ability, are weighed for inclusion. Therefore, it is fair to expect that these other talents would be nurtured and appreciate equally with STEM gifts and talents.

As a society, we can only hope that those who are STEM majors and plan to pursue a STEM career are doing so because that is what they have aspired to be because of internal interest, skill, and ability. The decision to pursue a career can be a difficult one, especially for students who are gifted and talented in many areas. Are gifted and talented students, both female and male, pursuing careers that match their interests, skills, and abilities? Are they being directed or guided?

Counseling

Counseling for gifted and talented students is an important portion of a well-rounded gifted education program. Peterson (2007) points out that knowledge and background in advising this special population is necessary to be effective consultants. There are particular concerns, challenges and characteristics of gifted and talented students that make this area of counseling complex. However, counselor training does not include nearly enough attention to giftedness. "An investigation focusing on Council for Accreditation of Counseling and Related Educational Programs (CACREP)-accredited programs found that only 62% of school counseling programs gave any attention at all to developmental concerns and counseling issues related to high ability" (Peterson, 2007, p. 274). Organizations such as the National Association for Gifted Children called for attention to this dissonance in 2006, and obtained results. The CACREP addressed the need, although there is still room for growth.

General and Emotional Counseling

Giftedness is always good, right? Often giftedness is thought of in only one facet. In some cases, being gifted and talented can be a heavy load to carry. Despite the benefits seen cognitively by being gifted and talented, there are many other areas of the affective individual that need to be addressed (Mildram, 1991). Stress from dense scholastic work-loads can heighten the sensitivity felt by many gifted individuals. The advanced cognitive aspect causes rapid interaction with the environment, compounding sensitivity. Gifted students observe and interact more with their environments that most students (Mendaglio, 2006). There has also been some theory regarding the emotional turmoil experienced by creatively gifted students. Creative students, especially during adolescence, need counselors who are trained to work with gifted teens to facilitate the right educational plan at an appropriate time in the educative process (Robinson et al., 2007). Several risk factors have been noted to accompany giftedness, including mismatches between the student and the educational environment, asynchronous development, finding and making friends, and pressure to fit in with their same age peers (Robinson, 2002). These difficulties have been recognized and resources made available to counselors and other stakeholders who work with gifted and talented students (National Association for Gifted Children, 2009).

In light of such emotional, social, and academic interactions, it is imperative that counseling be available for gifted and talented students from childhood into adulthood. One strong factor compounds the ability to counsel these students; they are not likely to seek help when experiencing anxiety, stress, and other challenges.

> It may be only when a gifted student commits suicide, reveals an eating disorder, becomes addicted to illegal substances, or drops out of high school or college that

> surprised adults become aware that intact facades of invulnerability may hide emotional pain. (Peterson, 2007, p. 275)

One way to address the unique needs of gifted and talented students is to meet one on one, as a small gifted peer group, or as part of a highly structured consultation program. In any case, all of these options need to be fitted to the individual student and address any area(s) that need attention. This is the same process given to children in high quality schools who are not identified as being gifted and talented, even if the focus is a bit different. The proactive approach to counseling is best (Peterson, 2007). Furthermore, implications of the perceptions gifted persons have of themselves can reveal more about the way in which they develop and express themselves. Gender differences are a special concern based on recent research (Perrone, Perrone, Ksiazak, Wright, & Jackson (2007).

Career Counseling

There is little disputing that gifted and talented students should have access to career guidance. The ability to serve as an agent of encouragement and use wise discretion are necessary to guide each student. Training in career counseling is conducted as part of many counseling programs. However, career counseling for gifted and talented students does incorporate some unique challenges (Kerr & Kurpius, 2004; Peterson, 2002, 2007).

Gifted students with multipotentiality may become very confused about their career paths. Such individuals have numerous and diverse abilities and interests. Often gifted individuals seem to have limitless potential (Greene, 2006). Appropriate interventions are necessary to help them cope successfully with the abundance of career choices available to them (Robinson et. al, 2007; Rysiew et. al., 1999). While decisions for a career choice need not be made too soon, there are certainly implications regarding the coursework that occurs in high

school. Those students who enjoy STEM investigation and also the arts equally are often very perplexed. Furthermore, student athletes or those involved in extracurricular activities amidst this mental battle may feel especially torn. There are several interest inventories, personality tests and career planning tools available. When given traditional career inventories, the results are often high in several areas, similar to common achievement test scores (Lee, 2002; Kerr & Kurpius, 2004; Peterson, 2007; Wessel, 1999). In this case, examining some career choices that may allow a mix of interests or passions may resolve the stress that accompanies students in such situations.

Sitting down with a student and listening to what he or she says regarding themselves, including interests and talents, is a crucial component in wise counseling. Taking into consideration the total person, career counseling at the high school age need not get as specific as stating the exact position to pursue. Instead, it should be a way to allow students to have as many opportunities as they can to explore options of interest. Ensuring students are able to complete coursework of interest, even if it varies widely, should be encouraged when possible. Scheduling can be difficult, especially in smaller schools. Astute counselors, however, can often find wise choices outside of the school, that may help accommodate interests and career exploration. In essence, for students with many interests and great potential in more than one area, exploration may be needed to find an appropriate career direction. Easing this stress through information and advocacy is best (Kerr & Erb, 1991; Kerr & Kurpius, 2004; Lee, 2002; Peterson, 2007; Wessel, 1999).

Underachievement relates to career counseling in that specific conversations need to take place that help individuals see the extensions of current performance. A talented young person may not fully understand the implications of their GPA, SAT, or classroom performance scores.

An advocacy approach is needed, and relating achievement to career interests can help motivate students. The development of appropriate focus to match interests can help shift underachievement and align students with career interests without pigeon holing (Peterson, 2002). On the other hand, Dr. Rena Subotnik states that if a student does have an area of passion there is reason to allow deep thinking and investigation in this area (as cited in Henshon, 2010).

Since teachers have an important role in the lives of students, they may also be instrumental in the career decisions that students make. In smaller schools there may not be career counselors or training readily available. Educators are encouraged to promote all students enrolling in math and science, and the achievement of both male and females in all academic areas. Educational planning conferences, encouraged and even required in some gifted programs, are an excellent opportunity to help students think broadly about their options for exploration. "Teachers can play a critical role in the career development of gifted girls and boys by recognizing the impact of these variables and creating classroom environments that encourage gifted girls to reach their full potential" (Nelson & Smith, 2001). In some studies done on career and technical education programs, both gifted and talented and general education students voiced their appreciation for the connection they felt with passionate technical teachers. Often, gifted students favored these courses due to their active nature (Gentry, Hu, Peters, & Rizza, 2008; Gentry, Peters, & Mann, 2007). In light of this, the informal counseling that may take place in and outside of the classroom is very important.

Career Development

Consistent with the career development theories, the National Occupational Information Coordinating Committee developed sets of competencies that can be used to develop career guidance programs from elementary school through college that when achieved by

> individuals are indications of appropriate career development (as cited in Grant, Battle, & Heggoy, 2000).

Three categories including self-knowledge, educational and occupational exploration, and career planning are included in the competencies. In studies that examine attrition in various fields, the authors have discovered various reasons for the attrition. Scholars in literature agree that the match between a career and an individual should be complimentary.

Researchers whose interest in science led them to research the Westinghouse Science Talent Search winners have given a nod to following a passion as a career choice. Subotnik, Stone, and Steiner (2001) concur that

> attrition from science is not problematic when it is due to falling in love with another domain of interest. What is not acceptable, however, is attrition of the superbly trained for a career about which the individual is less passionate due to lack of support and opportunity in science. (76)

Some of the winners left science and were pleased with their decisions, while others felt unguided (Subotni et al., 2001). Researchers found that of the 85 winners participating in the study, 41 males and 20 females remained in science. Perhaps those who expressed interest in science but were not pleased with the results and changed majors late in their scholastic experience could have been helped with career counseling during high school or early in their higher education experience. Counseling at the high school and college level is as important as counseling in other circumstances.

Female Career Choice

Female gifted and talented students have a variety of reasons for their career decisions. The availability of career choices has expanded for women, especially as gender roles have

become less marked in American society. For example, a longitudinal study that followed gifted individuals revealed that half of the gifted women had not followed full time career paths (Terman & Oden, 1959). This number has greatly increased.

Across many studies, resounding themes of career selection present themselves. While interest in a field is a factor almost always listed by participants identifying their major/career selection, parental approval is strongly considered. It is important to note that there is a lack of support for some career choices and a wrestle against traditional norms regarding marriage and children (Karnes & Stephens, 2002; Mendez & Crawford, 2002; Nelson & Smith, 2001; Subotnik et. al., 2001). Research conducted in the early 21st century examining the differences in career aspirations among gifted boys and girls suggests that although there are a greater number of careers that have female participants, gifted boys and girls still have a strong adherence to gender-role stereotypes in career aspirations. An increase in the number of childcare options has helped ease the ability to pursue a career for women. However, men still dominate the highest paid and most prestigious careers (Mendez & Crawford, 2002). Female students, despite more opportunities, still wrestle with their career choices.

An illustration of such career uncertainty is expressed in a study that followed gifted females on their journeys through higher education. Grant et al. (2000) conducted a study of seven gifted rural females through their college years and the influences on their career related decisions. These females had all been identified and placed in gifted programs as children. The purpose of the study was to "explore whether career related decisions of gifted females who are still involved in the educational process are hampered by influences that limit options" (Grant et. al., 2000, p. 252).

Data was collected over a period of five years. The first data collection was done the summer following the females' high school graduation. At that time, they were interviewed and completed a questionnaire. Their intended majors and future plans were noted. The second data collection point was conducted two years later. Again, interviews and questionnaires were completed for the seven female participants. At this collection point, there had been changes in the majors they had initiated. Finally, five years from the original data collection, a final round of interviews and questionnaires were collected. All of the females in this study changed their majors at least one time after graduating from high school.

> It is interesting that even though the participants were identified as gifted in elementary school and participated in a program for the gifted through the eighth grade, they made academic course decisions in high school that might be considered inconsistent with their giftedness. Some of these gifted females did not take advantage of all of the more academically challenging opportunities available to them as high school students, although they completed the college preparatory curricula in high school. (Grant et. al., 2000, p. 253)

Through the interviews and information obtained in the questionnaires, it was determined that parents were a strong influence on the career aspirations of the female students.

> The other apparent strong influence was extracurricular involvement for those whose career aspirations remained stable over time. Even though their majors changed, some benefitted from experiences in their K-12 school years in extracurricular activities in which the tasks and skills closely matched their career aspirations. (Grant et. al., 2000, p. 257)

Thoughts of marriage and a family were shown to have an influence on the career aspirations of these females. Their future plans were often interwoven with these concerns. For example, some of the women stated that they would work part time or take time off of their career to raise their children.

Interestingly, some of the female students demonstrated interest in science or mathematics careers, although this was identified as their least favorite high school subjects. It wasn't clear why this occurred. This is very similar to the responses given from the Subotnik et al. (2001) study in which some females who changed their majors from science listed a dislike of chemistry as a reason.

Although it is most likely a mixture of factors that influenced the career aspirations of these gifted females, it is clear there are still pressures at work that may be influencing the decisions of gifted and talented female students. In fact, this pressure may be felt much earlier than in the college years. Gottfredson's (1981) theory of circumstance and compromise indicates that by early adolescence, students have ruled out many careers that conflict with their gender roles, social statuses, or what they believe to be their intellectual potentials. In fact, there is some research that suggests that the school environment is a factor in the decision making process. Career counseling, explicitly and also expressed through counselor undertones, can have an impact on the expansion or limitation of career options. Furthermore, the program in place for gifted and talented students has favored female students in elementary school but notably reversed in high school (Nelson & Smith, 2001). Despite this, it is important to note that there is an increase in the similarity found in some studies between the career aspirations of gifted and talented boys and girls. This is largely due to more females selecting male-dominated

fields, rather than male students selecting female-dominated careers (Mendez & Crawford, 2002). Table 2 depicts the findings from the three data collection points.

Table 2

Gifted Female Career Study

Name	After HS: Major/Career	Two Yrs After HS: Major/Career	Five Yrs After HS/ Major/Career
Rose	Chemistry/Doctor	Studio Art/Uncertain	Studio Art
Cassandra	History/HS Teacher	English/Teacher or Writer	Secondary English Education/ HS Teacher
Tye	Engineering/Biomedical or Genetic Engineer	Biology/Uncertain	Interior Design/Working in Field
Ann	Recreation/Coach or Teacher	Business/Undecided	Education/Graduate School
Beth	Early Childhood Education Teacher	Special Education/LD Teacher	Special Education/Graduate School/Teacher
Kay	Biology/Doctor with Specialization in Psychiatry	Psychology/ Psychiatrist	Psychology/Applying to Health Professionals Graduate Schools/Working
Lisa	Marketing	Public Relations	Did not graduate/Working

Note. Grant, Battle, Heggoy, & Sennove, (2000)

Male Career Choice

Men dominate the careers that are the highest paid, most prestigious, and require the most education. While there is an increase of women in these careers, it is obvious that male gender roles are favored in these positions. Many of these positions are STEM related. As one might

imagine, female students would be more attracted to these highly regarded positions than males would be to female-dominated aspirations (Mendez & Crawford, 2002).

As with female gifted and talented students, male students also are influenced by gender roles when selecting their careers. In several studies male participants repeatedly adhered to gender roles and selected male-dominated career aspirations. In Mendez and Crawford's (2002) study regarding gender-role stereotyping, they found that of 60 occupations given, talented female students expressed interest in 22.28 of them. Gifted boys, however, indicated interest in 18.53. The Sex Type of the occupations revealed a significant preference of the boys to follow currently male-dominated careers (Mendez & Crawford, 2002). Another study revealed the need for a strong sense of self when male students pursue female-dominated careers. The decision of six gifted and talented undergraduates pursuing elementary education readily confirms this (Hebert, 2000). On the other hand, this study and others also include pressure from parents, peers, and the school environment as career shaping agents (Haensly & Lehmann, 1996; Lee, 2002; Mendez & Crawford, 2002).

In recent studies, there have been confounds to male students pursuing careers in traditionally female careers. Peers, especially as they are developing their interests and talents, have an impact on the direction in which students head. Some male students, often those with a high self-concept, can hold up to the ridicule they sometimes experience as a result of following certain careers not considered traditionally male oriented. Career choices are often made in relation to the need for approval from others, including male role models (Greene, 2006).

Regardless of gender, there is evidence that factors outside of the individual both explicitly and without knowledge shape the career aspirations of gifted students. Factors for females include parents, gender roles, family aspirations, and the availability of educational

opportunities and mentors. Male gifted and talented students often feel intense pressure to maintain their perceived gender roles and are impacted early by family, peers, and the educational atmosphere related to gender roles. Those who have a strong sense of self and positive role models and mentors of their gender tend to fair best in career paths that are nontraditional.

Self-Directed Search

One instrument that has been created to assist individuals with their career selection is the *Self-Directed Search* (SDS). This instrument was created based on Holland's (1997) work over the course of several decades. Holland published a theoretical article in 1959 that took a new look at an individual and his/her environment. In an interview, Holland defined the origins of his theory that led to the development of the SDS. These influences include his work history, counseling experience, and the difficulty he experiences with other assessments (Weinrach, 1980). Holland worked as an induction interviewer for the military for several years, and became very interested in the typologies he discovered. His experience counseling in graduate school only confirmed what he had noticed.

The *Vocational Preference Inventory* (VPI) in 1959 was his first attempt to create a more useful tool for those seeking guidance. Holland stated that the six typologies for the SDS began in this early work. "After an energetic decade of developing, testing, and revising a typology of vocational personalities and work environments, Holland used the theory as a template for the *Self-Directed Search*" (Gottfredson & Johnstun, 2009). In response to the need for a more simple and effective way to help match people and occupations, he created a hexagon that depicted the six environment and personality types. The environments and personality types include the following: Realistic, Investigative, Artistic, Social, Enterprising, and Conventional

(Holland, 1994, 1997). The hexagon represents a relationship among the typologies, with those closer together being more similar. After a somewhat slow start, Holland's theory and the SDS have gained wide-spread use and appreciation. His expertise and instruments have been used to make enhancements to the Strong Inventory, resulting in the Strong Campbell Interest Inventory (SCII). The SCII has the ability to provide feedback on the scales created by Holland (Weinrach, 1980). His expertise has been sought by professionals in the field of education, counseling, and business.

While Holland's work has become quite popular, the early critics were very outspoken in their skepticism of the validity and reliability of the measure. One of the most noted criticisms came from feminist groups who claimed the SDS was sex biased. In an interview, Holland said, "I thought the Self-Directed Search was a useful inventory for both women and men. I went to work dealing empirically with all the criticisms, one by one, because initially I, too, thought there might be something to what the critics said" (Holland, as cited in Weinrach, 1980, p. 409). Holland conducted several experiments without finding evidence that the SDS had a negative effect on women (Weinrach, 1980). However, the items with sexist endings were removed. The effect that sex, social class, and racial background might present was on the SDS, which was the first in such inventories. Others thought his work would be more useful in combination with other interventions.

> Interest inventories such as Holland's Self-Directed Search have the potential to provide clients with direction and clarity in the career decision-making process. However, it is not uncommon for individuals to face difficulties in processing the information they obtain from interest inventories. (Vernick, 2002, p. 1)

The Career Thoughts Inventory has been suggested as a pairing with the SDS.

The construct validity of the SDS was tested in Canada, and found that the questionnaires containing the SDS that were returned confirmed the hexagonal model of Holland's theory. The researchers confirmed the structure of the instrument was sound. However, there were some issues with the subtests that demonstrated the possible need for enhancement (Rachman, Amernic, & Aranya, 1981). A revision of the SDS has occurred since this time.

The 1994 revision of the *Self-Directed Search* was tested for concurrent validity with Chinese high school students. The students' final codes were compared with their academic track. The study found a correspondence between the codes and the intended college majors. Students on science tracks, for example, demonstrated higher Investigative and Realistic scores. The Arts track students exhibited higher Artistic codes. It was noted that there was lower correspondence with the high-point interest code than had been found in American-based studies of the SDS. The authors did include a discussion of the implications for international cultural validity, but found that their study did in fact support the concurrent validity of the SDS (Leung & Hou, 2001).

The typologies for environments and personalities have been repeatedly tested, and he has a well versed group of professionals in psychology and counseling that value his theory and the SDS.

> Holland's theory, assessment instruments, and intervention tools transformed the delivery of vocational assistance by counselors, schools, and impersonal mechanisms. This occurred because of the organizing power of his theory of persons and environments, the ease with which the theory can be communicated to counselors and clients, and the self-directed nature of the interventions and assessments he developed. (Gottfredson & Johnstun, 2009).

Ideas and influences that are beyond the scope of the typology have been acknowledged, including the recent economic plight, family responsibilities and influences, and possible mental illnesses. These factors may directly influence a person's ability to select or follow the career path he/she would prefer. Even with the acknowledgment, the typologies still hold.

The instrument indicates that individuals making career decisions should utilize the Summary Code in the strongest order when first looking for possibilities. However, the next step is to utilize every possible combination of this three-letter code.

Psychological Assessment Resources (PAR), a company that provides resources to many colleges and counseling programs, promotes the *Self-Directed Search*. "The SDS enables individuals to choose careers and fields of study that best match their self-reported skills and interests" (PAR, 2009, ¶ 2). A link on the PAR website devoted to the SDS has been set up with detailed information related to the long-term, overwhelmingly positive response to the SDS. Now in its fourth edition, the SDS has been revised and field tested repeatedly.

The *Self-Directed Sear*ch may provide interesting information when it comes to where the gifted and talented students are heading with their career choices. What are these students' interests and skills? What typology code will they receive based on their interests and skills? Will this match their career aspirations?

CHAPTER 3

Research Methodology

A survey research design was implemented for this study. The survey participant group (*n*=20) was composed of female and male University Honors Program students enrolled at Indiana State University. The survey group was comprised of 10 female University Honors Program students and 10 male University Honors Program students. All students in this program were undergraduates. This group met the criteria for inclusion into the program which included one or more of the following: above average SAT or ACT scores, an outstanding high school GPA, or transfer GPA from another college that is above average. These students were considered gifted and talented. The population included about 500 individuals. Those who were at least 18 years of age or older were invited to participate.

The Self-Directed Search Assessment Booklet: A Guide to Educational and Career Planning was completed by participants. This instrument took between 20 and 30 minutes for participants to complete. The survey instrument called for participants to respond to various groups of items. Respondents first listed occupations that they had considered for their futures. The most recent choice was listed first, and progressed backwards to earlier careers they had considered. Activities, Competencies, Occupations, and Self-Estimate comparison sections followed. The aforementioned are all related to one of six personality and environment typologies. The categories include realistic (R), investigative (I), artistic (A), social (S),

enterprising (E), and conventional (C). The survey then called for participants to indicate if they liked or disliked various activities by checking *L* or *D*. Competencies were indicated as competent by checking *Y* or not proficient by checking *N*. Attitudes regarding occupations were indicated favorably by checking *Y* or, if disliked, by checking *N*. A Self-Estimates section called for participants to compare themselves with others their own age on various skills and abilities. A scale of 1 to 7 was utilized. The participants were done with the portion of the survey requested once they had completed the Self-Estimates section.

Research Questions

1. Do the most recent career aspirations of University Honors Program students match their self-perceptions Summary Codes?
    a. Is there a difference between female and male University Honors Program students' match between their most recent career aspirations and their self-perceptions Summary Codes?
2. What category of activities do University Honors Program students like?
    a. What category of activities do University Honors Program students like most?
    b. Is there a difference between the category of activities female and male University Honors Program students like most?
    c. What category of activities do University Honors Program students like least?
    d. Is there a difference between the category and activities female and male University Honors Program students like least?
3. What category of competencies do University Honors Program students have?
    a. What category of competencies do University Honors Program students have most?

b. Is there a difference between the category of competencies female and male University Honors Program students have most?

c. What category of competencies do University Honors Program students have least?

d. Is there a difference between the category of competencies female and male University Honors Program students have?

4. What occupations interest or appeal to University Honors Program students?

a. What occupations interest or appeal to University Honors Program students most?

b. Is there a difference between the occupations that interest female and male University Honors Program students most?

c. What occupations interest or appeal to University Honors Program students least?

d. Is there a difference between the occupations that interest female and male University Honors Program students least?

5. How do University Honors Program students rate themselves compared with other persons their own age in abilities and skills?

a. How do University Honors Program students rate themselves compared with other persons their own age in mechanical ability?

b. Is there a difference between how female and male University Honors Program students rate themselves compared with other persons their own age in mechanical ability?

c. How do University Honors Program students rate themselves compared with other persons their own age in scientific ability?

d. Is there a difference between how female and male University Honors Program students rate themselves compared with other persons their own age in scientific ability?

e. How do University Honors Program students rate themselves compared with other persons their own age in artistic ability?

f. Is there a difference between how female and male University Honors Program students rate themselves compared with other persons their own age in artistic ability?

g. How do University Honors Program students rate themselves compared with other persons their own age in teaching ability?

h. Is there a difference between how female and male University Honors Program students rate themselves compared with other persons their own age in teaching ability?

i. How do University Honors Program students rate themselves compared with other persons their own age in sales ability?

j. Is there a difference between how female and male University Honors Program students rate themselves compared with other persons their own age in sales ability?

k. How do University Honors Program students rate themselves compared with other persons their own age in clerical ability?

l. Is there a difference between how female and male University Honors Program students rate themselves compared with other persons their own age in clerical ability?

m. How do University Honors Program students rate themselves compared with other persons their own age in manual skills?

n. Is there a difference between how female and male University Honors Program students rate themselves compared with other persons their own age in manual skills?

o. How do University Honors Program students rate themselves compared with other persons their own age in math ability?

p. Is there a difference between how female and male University Honors Program students rate themselves compared with other persons their own age in math ability?

q. How do University Honors Program students rate themselves compared with other persons their own age in musical ability?

r. Is there a difference between how female and male University Honors Program students rate themselves compared with other persons their own age in musical ability?

s. How do University Honors Program students rate themselves compared with other persons their own age in understanding of others?

t. Is there a difference between how female and male University Honors Program students rate themselves compared with other persons their own age in understanding of others?

u. How do University Honors Program students rate themselves compared with other persons their own age in managerial skills?

v. Is there a difference between how female and male University Honors Program students rate themselves compared with other persons their own age in managerial skills?

w. How do University Honors Program students rate themselves compared with other persons their own age in office skills?

x. Is there a difference between how female and male University Honors Program students rate themselves compared with other persons their own age in office skills?

Hypotheses

$H_0$1. The most recent career aspirations of University Honors Program students will match their self-perceptions Summary Codes.

1. There will be no difference between female and male University Honors Program students' match between their most recent career aspirations and their self-perceptions Summary Codes.

$H_0$2. The category of activities University Honors Program students like:

1. The category of activities University Honors Program students like most is investigative.
2. There will be no difference between the category of activities that female and male University Honors Program students like most.
3. The category of activities University Honors Program students like least will be artistic.
4. There will be no difference between the category of activities that female and male University Honors Program students like least.

$H_0$3. The category of competencies University Honors Program students have:

1. The category of competencies University Honors Program students have most is investigative.
2. There will be no difference between the competencies female and male University Honors Program students have most.
3. The category of competencies University Honors Program students have least is artistic.
4. There will be no difference between the competencies female and male University Honors Program students have least.

$H_0$4. The occupations that interest or appeal to University Honors Program students:

1. The occupations that interest or appeal to University Honors Program students most are investigative.
2. There will be no difference between the occupations that interest or appeal to female and male University Honors Program students most.
3. The occupations that interest or appeal to University Honors Program students least are artistic.
4. There will be no difference between the occupations that interest or appeal to female and male University Honors Program students least.

$H_0$5. University Honors Program students rate themselves compared with other persons their own age in abilities and skills:

1. University Honors Program students rate themselves compared with other persons their own age in mechanical ability as average.

2. There will be no difference between how female and male University Honors Program students rate themselves compared with other person their own age in mechanical ability.

3. University Honors Program students rate themselves compared with other persons their own age in scientific ability as high.

4. There will be no difference between how female and male University Honors Program students rate themselves compared with other person their own age in scientific ability.

5. University Honors Program students rate themselves compared with other persons their own age in artistic ability as below average.

6. There will be no difference between how female and male University Honors Program students rate themselves compared with other person their own age in artistic ability.

7. University Honors Program students rate themselves compared with other persons their own age in teaching ability as average.

8. There will be no difference between how female and male University Honors Program students rate themselves compared with other person their own age in teaching ability.

9. University Honors Program students rate themselves compared with other persons their own age in sales ability as average.

10. There will be no difference between how female and male University Honors Program students rate themselves compared with other person their own age in sales ability.

11. University Honors Program students rate themselves compared with other persons their own age in clerical ability as average.
12. There will be no difference between how female and male University Honors Program students rate themselves compared with other person their own age in clerical ability.
13. University Honors Program students rate themselves compared with other persons their own age in manual skills as average.
14. There will be no difference between how female and male University Honors Program students rate themselves compared with other person their own age in manual skills.
15. University Honors Program students rate themselves compared with other persons their own age in math ability as above average.
16. There will be no difference between how female and male University Honors Program students rate themselves compared with other person their own age in math ability.
17. University Honors Program students rate themselves compared with other persons their own age in musical ability as below average.
18. There will be no difference between how female and male University Honors Program students rate themselves compared with other person their own age in musical ability.
19. University Honors Program students rate themselves compared with other persons their own age in understanding of others as average.

20. There will be no difference between how female and male University Honors Program students rate themselves compared with other person their own age in understanding of others.
21. University Honors Program students rate themselves compared with other persons their own age in managerial skills as average.
22. There will be no difference between how female and male University Honors Program students rate themselves compared with other person their own age in managerial skills.
23. University Honors Program students rate themselves compared with other persons their own age in office skills as average.
24. There will be no difference between how female and male University Honors Program students rate themselves compared with other person their own age in office skills.

Sampling Procedure

The participants for this study were taken from the University Honors Program at Indiana State University. These students came with many attributes often associated with gifted and talented populations, and are referred to as such in this research. Obtaining admittance to the University Honors Program is competitive.

There are currently about 500 students enrolled in the University Honors Program at Indiana State University. Minimum requirements for admittance include one or more of the following: above average SAT and/or ACT scores, outstanding GPA of 3.7 or better, and/or be in the top 10% of their graduating class. The trend of grades and difficulty of coursework are other factors considered for admission. Challenging and experiential learning experiences are part of

the program design. A four-course curriculum allows students to develop analytic skills while working across disciplines. Furthermore, University Honors Program students work through electives in one of three concentrations: Global Perspectives, Leadership and Civic Engagement, and Honors in the Major and General Education. Students must maintain an above average GPA (University Honors Program, 2010).

A list of the University Honors Program students was compiled by the University Honors Program. All University Honors Program students who were 18 years or older were invited via email to participate in the research. Initial contact was made through the University Honors Program Office. The email indicated two separate evening opportunities for participation on the campus of Indiana State University. While it was desirable for all the members of the population to participate, a sample of 20 was obtained.

Research Instrument

There was one instrument for this study. *The Self-Directed Search Assessment Booklet: A Guide to Educational and Career Planning, Form R* (4th edition) was utilized. According to Psychological Assessment Resources (PAR), this assessment was designed by Dr. John L. Holland, and is based on his theory of vocation. Created in response to personality-environment typology research, this survey has been revised and enhanced with the growing career fields. Six typologies have been created, with people fitting *loosely* into one category. The categories include Realistic (R), Investigative (I), Artistic (A), Social (S), Enterprising (E), and Conventional (C). Occupations and environments can be classified in this way, according to Holland's research. Both paper-pencil and online versions are available.

> The SDS can help you make the best career decisions wherever you are in your life. It has been used by more than 30 million people worldwide and has been translated into

more than 25 different languages. SDS results have been supported by more than 500 research studies. (PAR, 2009, ¶ 1)

The first part of the assessment asked for participants to list their occupational aspirations, beginning with the most recent one and working backward. There were up to eight lines to use. The second step listed on the page prompted for use of the Occupations Finder to locate the three letter codes that accompany each aspiration. The participants were instructed not to do this portion. The second portion called for participants to mark a box under *like* or *dislik*e for a variety of activities. Section three allowed participants to blacken boxes under *yes* or *no* in response to various competencies. An inventory of interest and appeal regarding certain careers was next. The Self-Estimates section asked participants to rate themselves as they *really think you are when compared with other persons your own age*. A three-letter Summary Code results from the analysis of the total positive indications in each section.

Materials and Equipment

One *Self-Directed Search* workbook was needed for each participant. These were purchased from Psychological Assessment Resources. Pencils with erasers were also supplied so that participants could erase, if necessary. One copy of the *Occupations Finder* was needed for this study. Two file boxes with locks were purchased to store the informed consent forms as well as the surveys. The reserved room in Rhoads hall already contained individual desks and quality lighting.

Survey Procedure

The entire population that meets the criteria was invited to participate in the study. Data was collected during a single meeting with participants. Two days were scheduled for participants on the campus of Indiana State University. February 22nd and 23nd at 7:00 pm were

the participation dates. The Rhoads Hall Honors classroom was utilized for the data collection. Students were invited into the designated area to complete the survey. On the first evening, there were nine University Honors Program students participating. On the second evening, there were 11 University Honors Program students.

Participants were given an overview of the research and an opportunity to ask questions before continuing in their participation. Writing utensils and informed consent forms were given out. An explanation of the form was presented, along with time to read and consider participation before signing. The signed informed consents were collected and locked in a file box. Instructions for completing the *Self-Directed Search* (4th ed.) booklets were given after the booklets were passed out. Participants were asked to identify themselves only as male (M) or female (F) along with their major(s). The participants were told that at any time during the session, they may choose to discontinue participation and take their books or destroy them. Once each participant completed the *Self-Directed Search* (4th ed.), he or she turned in the survey and was free to leave.

Design

This study reflects a survey research design. The design was considered exempt by the Institutional Review Board at Indiana State University, although full documentation for full review was still submitted.

Initial contact with participants was made using emails generated from the University Honors Program Office. Dr. Greg Bierly generated three emails inviting students to participate. This study employed a one-time, face-to-face meeting with participants to administer the *Self-Directed Search* (4th ed.) instrument. Two opportunities for participation were available. The

design ensured that only voluntary participation in a safe environment was conducted. Students were asked to come to the Rhoades Hall Honors Classroom to participate.

An overview of the research and an opportunity for questions to be answered was given before informed consent forms were distributed. Once reviewed and signed, the informed consent forms were collected and put in a locked box. The survey instrument was given out and the participants asked to identify themselves as only male (M) or female (F) and list their major(s) on the line that is labeled for a name. Directions for the SDS were given, and participants had the opportunity to complete the survey at their own paces.

Once participants completed the survey, they put them in the second secure file box. While participants were informed they could withdraw from the research at any time without turning in the survey, none of them chose to do so. Once all participants completed the instrument, the booklets were locked in the file box and carried with the secured informed consent forms to a secure location. At no time were the participants or the surveys left unattended during the group administration periods. The principal investigator secured the data and utilized it for data analysis under private conditions.

Risks and Benefits

This research involved minimal risk to the participants. The research did not ask participants to connect themselves with data, and the participants did not know the specific criteria for which they were chosen, other than their participation in the University Honors Program at Indiana State University. Students were only asked to identify their sex and major on the name line of the survey. The research was recognized as exempt by the Institutional Review Board at Indiana State University.

The benefits of this research entail a broader understanding of the University Honors Program students at Indiana State University. An ability to provide expanded extra-curricular activities and community engagement could be an option pursued to serve this gifted and talented population. Based upon their responses, the University Honors Program at Indiana State University could provide an environment that meets the vocational and avocational interests of its participants. Furthermore, this exploratory study captured a picture of the career aspirations gifted and talented students had when they came to college and how it connects, or does not connect, with their interests and skills.

Analysis of Data

Each participant's survey was analyzed. Using *The Occupations Finder* by Holland, the corresponding three letter Summary Code for the most recent career aspiration each participant listed on the *Self-Directed Search* (4^{th} ed.) was located. Next, totals for each of six areas (R-realistic, I-investigative, A-artistic, S-social, E-enterprising, and C-conventional) were calculated by adding up the number of affirmative responses in each section of the *Self-Directed Search* instrument. Sections included Activities, Competencies, Occupations, and Self-Estimates. After combining the total in each of the six areas from the sections, a three letter Summary Code depicting the participants' typology was revealed. Since the basic arithmetic for each survey was completed by hand and with a calculator, the process was completed three times before the data was moved into a computer program.

Comparison between the career aspirations and the Summary Codes was completed. Following this, the mean, median, mode, maximum, and minimum for each type and section was compiled for the whole population, as well as for the female and male participants. Microsoft Excel and SPSS were essential in the statistical analysis.

Discussion of Statistical Analysis

Statistical analysis took place following the data collection. The SPSS program was utilized to perform the statistical analysis. A series of T-tests were used to determine if any significant differences existed between the means of the gender groups. Mean, median, and mode were also used to describe the participants and their self-perceptions and preferences.

CHAPTER 4

Results

Instrument

Gifted and talented students are part of a group that has experienced a wide variance in programming. There are many dynamic programs that appreciate and encourage passion in a wide variety of exceptionalities. On the other hand, there are programs that focus prematurely on STEM curriculum at the expense of the arts. There also exist some programs strictly for expressive arts, such as those found at Julliard. In higher education, University Honors Programs can provide a challenge for students who continue to seek differentiated curriculum and extensive research.

The population for this study was the University Honors Program students at Indiana State University. Exploring their career aspirations and self-perceptions allowed a snapshot of this population to develop. This was an important descriptive expression of these students' career dreams, skills, and interests. It can lead to relevant discussion of these students and gifted programming.

Holland developed his career theory through many years of intense observation and research. His practical work with the military led him to graduate studies, where he began counseling and documenting what he was noticing. His research and ideas, while controversial in his seminal days as a scholar, were challenged and tweaked. Holland considered criticisms

and made changes when warranted. His ideas were polished and he developed a career theory based on the fit between work environments and individuals. Decades of research were used to create the most recent version of the *Self-Directed Search: A Guide to Educational and Career Planning* (4th ed.). This instrument is referred to as the SDS and was last updated in 1994. The *Occupations Finder* is the companion booklet that allows interpretation of the results from the SDS. The instrument contains items that can be characterized in one of six categories. These include Realistic, Investigative, Artistic, Social, Enterprising, and Conventional. Each category contains jobs that depict a particular person and environment fit. Realistic is characterized by jobs that utilize manual skills. Investigative is characterized by processes, logic, and investigative interests. A person who is creative and expressive may be strongest in the Artistic category. The Social category depicts an environment working closely with and for people. Enterprising individuals enjoy entrepreneurial situations and business endeavors. The Conventional person is one who is proficient and skilled at organizational work. Since people are multi-faceted, a hexagonal model was created, with people fitting into a main category and having secondary categories. According to Holland (1994, 1997) the instrument is able to obtain a Summary Code that is indicated by adding the totals from each category for the sections and putting the top three in order from greatest to least. This survey instrument contains several sections that call for individual responses, including the following: Occupational Daydreams, Activities, Competencies, Occupations, Self-Estimates. The SDS survey was given to University Honors Program students as a way to see if their career aspirations matched their self-perceptions Summary Codes. Table 3 outlines what is called for by the survey in each of the sections participants completed.

Table 3

Self-Directed Search Sections

Category	Instructions for Completion
Occupational Daydreams	List most recent careers considered and work backward in time to earlier aspirations.
Activities	Indicate activities you like by checking L and activities you dislike by checking D.
Competencies	Indicate yes for things you do well at by checking Y and things you do not do well or do not have experience with by checking N.
Occupations	Indicate occupations that appeal to you by checking Y and occupations that do not interest you by checking N.
Self-Estimate	Rate yourself compared to your same age peers on a scale from 1 to 7, with 7 being high and 1 being low.

Procedures

The first portion of data analysis required the *Self-Directed Search* instruments to be scored. The most recent career aspiration in the Occupational Daydreams section at the front of the booklet was retrieved. A code for the career aspiration was pulled from the *Occupations Finder* that was designed to interpret the Summary Code. The Summary Code was entered into the blank boxes beside the career aspiration in each booklet.

Next, each participant's responses to the sections and subsections of the survey were scored. Each of the sections, including Activities, Competencies, Occupations, and Self-Estimates, contained subsections with areas to indicate preference or estimations that adhered to each type. Each subsection was simply labeled R (Realistic), I (Investigative), A (Artistic), S (Social), E (Enterprising), or C (Conventional). All checkmarks or darkened boxes were able

to be counted, since all respondents completed the forced response and self-estimates areas with only one indication per item.

The scores from each section were entered into the booklets on page 10, which gave instruction for an individual to obtain a personal Summary Code. The top three numerical scores indicated the top three letters to be included in the Summary Code. The Summary Codes were written in the boxes indicated, with the highest indication being in the first position, the next highest Code in the second position, and the third highest number's corresponding Code in the third box. The three Codes in order made up the Summary Code. According to Holland's (1994, 1997) theory, this was the best indication of the direction an individual should begin looking if interested in finding a career or pursuing a career change. While it was not part of this study, it is suggested in the PAR materials that individuals who took the assessment use the *Occupations Finder* to search for their Summary Code in its exact order to examine career possibilities. Holland's assessment indicated that the Summary Code is in the order of strength from the assessment, but that it is

> vital that you search The Occupations Finder for every possible ordering of your three-letter code. For example, if you are an ESC, search for all the ESC, ECS, SEC, SCE, CES, and CSE occupations by completing Steps 1 and 2. (Holland, 1994, p. 11)

A section at the back of the booklets indicates some next steps, including information about Summary Code matches and other factors that may influence careers.

Findings

The University Honors Program at Indiana State University contains majors from several areas. The participants in this study represented 19 majors, some in combination as double majors, including the following: Anthropology, Aviation Management, Chemistry, Criminology,

Elementary Education, English, English Education, Health, History, Interior Design, Language Studies, Legal Studies, Math, Math Education, Music Education, Political Science, Pre-Medicine, Professional Aviation Flight Technology, and Psychology. Six members of the sample had double majors. The two female double majors included the following combinations: Math and Math Education, Political Science and Legal Studies. Four male double majors had the following combinations: History and Language Studies, Criminology and Psychology, Political Science and Legal Studies, and Aviation Management and Professional Aviation Flight Technology.

For the purposes of this study, the most recent career aspiration was compared with the Summary Code obtained from the aforementioned procedures. Analysis of the data was conducted to determine if the first hypothesis should be rejected.

Hypotheses

$H_0$1. The most recent career aspirations of University Honors Program students will match their self-perceptions Summary Codes.

1. There will be no difference between female and male University Honors Program students' match between their most recent career aspirations and their self-perceptions Summary Codes.

The following Tables 4 and 5 indicate that of the 20 participants, only one shared a Summary Code that matched the exact order of the code of the most recent career aspiration. Table 4 illustrates female data, while male data is illustrated in Table 5.

There were three participants whose primary three letters matched, although in a different order than that of their exact Summary Codes. Furthermore, there were eleven other participants whose self-perceptions Summary Code contained two of the three letters that their career

aspiration had. On the other hand, there were five participants whose aspiration codes only corresponded by one letter with the Summary Code based on their interests, skills and abilities.

Table 4

Career Aspiration Codes and Self Perceptions Summary Codes for Females

Career Aspiration Code	Self-Perceptions Summary Code	3 of 3 (exact Order)	3 of 3	2 of 3	1 of 3	0 of 3	Major
AES	CRS				X		Interior Design
SAE	SIC				X		Math. Ed.
IRE	IAS				X		Anthropology
SAE	ASI			X			Elem. Ed.
ISR	ISC			X			Health
ISR	IAS			X			Chemistry
IRE	EIS			X			Anthropology
ISE	ISA			X			Pre-Medicine
SEI	ISE		X				Math/Math Ed.
ESA	AES		X				Legal Studies/ Political Sci.

Note. (n = 10)

Table 5

Career Aspiration Codes and Self-Perceptions Summary Codes for Males

Career Aspiration Code	Self-Perceptions Summary Code	3 of 3 (exact Order)	3 of 3	2 of 3	1 of 3	0 of 3	Major
SEI	EAC				X		History/Language Studies
SER	SEI			X			Criminology/ Psychology
ESI	ECS			X			Political Science/ Legal Studies
IRE	ISA				X		Chemistry
IRE	IRE	X					Chemistry
AIE	SAI			X			English
SAE	ASR			X			English Education
ERS	ASE/C			X			Music Education
SIE	IAS			X			Chemistry
IRE	RIE		X				Aviation Management/Prof. Aviation Flight Technology

Note. (n = 10)

In light of this data, it was determined that while there was only one student whose self-perception Summary Code matched his career aspiration code exactly, three others shared the same letters between two codes. Therefore, four of the 20 participants had a match of all three letters between the codes. This is 20% of the population. Therefore, it can be determined that the

hypothesis has been rejected. However, 75% of the population fell in a range of exact or similar match that Holland (1994, 1997) considered appropriate in selecting a fulfilling career. Therefore, it can be determined that the hypothesis has been supported and accepted *if* the acceptable range for person-environment fit is considered a match.

There was a very comparable rate of matches, both three-letter matches and two-letter acceptable range matches, among females and males. Seven of 10 female students had a correspondence between their career aspiration codes and their self-perceptions Summary Codes. Eight of 10 male participants experienced the same successful correspondence of two or more letters between the codes. Male participants had a higher rate of match and also the only member who had an exact ordinal match. However, it must be noted that this is not a significant difference due to the small sample and close proximity of the results. Therefore, the hypothesis is accepted; there is not a difference between female and male University Honors Program students and the rate of matches between career aspiration codes and self-perception Summary Codes.

Following the career aspiration section, each participant completed a series of sections that prompted participants to indicate their interests and abilities in the following: Activities, Competencies, Occupations, and Self-Estimates. Each section contained subsections made up of Realistic, Investigative, Artistic, Social, Enterprising, and Conventional items. A descriptive analysis was conducted using Microsoft Excel and the SPSS program. The data was able to indentify some preferences of the University Honors Program students at Indiana State University. Measures of central tendency were revealed including minimum, maximum, mean, and the standard deviation. Table 6 represents the SPSS group statistics in a broad way. Numerical data was inserted related to each section for this group analysis. For example, in the

Activities section, participants could select 0 up to 11 items in the Realistic, Investigative, Artistic, Social, Enterprising, and Conventional areas. The Competencies section also allowed a range from 0 to 11 on the areas. Meanwhile, the Occupations and Self-Estimates sections allowed a range of affirmative responses from 0 to 14 per area. More specific analysis and relation to confirming or rejecting proposed hypotheses was addressed for each section.

The Group Descriptive Data Table (Table 6) is referenced throughout the analysis of the data. This table provides a reference to each of the four remaining sections of the survey: Activities, Competencies, Occupations, and Self-Estimates. The minimum, maximum, mean, and standard deviation for the total sample are included in the table. Additionally, tables have been provided to help illustrate the findings among female and male participants as subgroups. Group Statistics for Activities (Table 7), Group Statistics for Competencies (Table 8), Group Statistics for Occupations (Table 9), and Self-Estimates of Female and Male University Honors Students (Table 10) were crucial in the analysis between female and male participants.

Table 6

Group Descriptive Data by Section and Code

Descriptive Statistic	*N*	Minimum	Maximum	Mean	*SD*
Realistic Activities	20	0	10	4.40	3.589
Investigative Activities	20	1	11	6.70	3.743
Artistic Activities	20	1	11	6.15	3.150
Social Activities	20	2	10	6.40	2.010
Enterprising Activities	20	0	11	5.95	2.964
Conventional Activities	20	0	9	3.40	2.798
Realistic Competencies	20	0	11	4.25	2.954

Table 6 (continued)

Descriptive Statistic	*N*	Minimum	Maximum	Mean	*SD*
Investigative Competencies	20	4	11	8.50	2.395
Artistic Competencies	20	1	9	5.60	2.604
Social Competencies	20	0	11	7.55	2.481
Enterprising Competencies	20	1	11	6.95	2.743
Conventional Competencies	20	2	10	6.95	2.645
Realistic Occupations	20	0	5	1.55	1.701
Investigative Occupations	20	0	12	4.50	4.274
Artistic Occupations	20	0	14	5.10	4.103
Social Occupations	20	0	12	4.50	3.967
Enterprising Occupations	20	0	12	2.40	3.440
Conventional Occupations	20	0	11	2.25	3.354
Realistic Self-Estimates	20	2	12	7.55	2.837
Investigative Self-Estimates	20	7	14	11.15	2.059
Artistic Self-Estimates	20	4	13	9.55	2.481
Social Self-Estimates	20	5	14	11.35	2.231
Enterprising Self-Estimates	20	2	14	8.30	2.975
Conventional Self-Estimates	20	4	14	9.20	2.628
Valid *N* (listwise)	20				

$H_0$2. The category of activities University Honors Program students like:

1. The category of activities University Honors Program students like most is investigative.
2. There will be no difference between the category of activities that female and male University Honors Program students like most.
3. The category of activities University Honors Program students like least will be artistic.
4. There will be no difference between the category of activities that female and male University Honors Program students like least.

Indeed, the category of activities that University Honors Program students indicated they liked most was Investigative. The hypothesis was confirmed for this sample by the indication that 50% of the sample had the highest scores of activities they enjoyed in the Investigative Activities section. The mean for Investigative Activities was 6.70 for the total participant group. The minimum was 1 and the maximum was 11. The standard deviation was 3.74, which is reflective of the small sample size with a large range. The mode for this population was 11, respectively. In light of this data, the hypothesis that University Honors Program students will like Investigative Activities most is accepted.

Of those participating in the survey, 60% of females and 40% of males had the Investigative category as their highest in the Activities section. It is important to note that while the females were strongly situated in this area (with Social Activities also receiving one or two indications of preference), the male participants had a cluster of responses indicating that Enterprising activities were preferred more. When the data was entered into SPSS using the numerical data obtained from the Activity subsections, the highest mean was situated in the

Enterprising area for male respondents. The female sample had an Investigative mean of 7.60 with a standard deviation of 3.373, while the male sample had an Investigative mean of 5.80 with a standard deviation of 4.050. Meanwhile, the male sample had an Enterprising mean of 6.90 with a standard deviation of 2.601. Table 7 reveals that while the entire sample preferred Investigative Activities, the male sample prefers Enterprising Activities more than Investigative Activities. Therefore, the hypothesis that there will be no difference between the category female and male University Honors Program students like most has been rejected.

Table 7

Group Statistics for Activities

	Sex	*N*	Mean	*SD*	*SE* Mean
Realistic Activities	1	10	3.20	3.521	1.114
	2	10	5.60	3.406	1.077
Investigative Activities	1	10	7.60	3.373	1.067
	2	10	5.80	4.050	1.281
Artistic Activities	1	10	6.40	3.777	1.194
	2	10	5.90	2.558	.809
Social Activities	1	10	6.80	1.687	.533
	2	10	6.00	2.309	.730
Enterprising Activities	1	10	5.00	3.127	.989
	2	10	6.90	2.601	.812
Conventional Activities	1	10	4.40	2.716	.859
	2	10	2.40	2.633	.833

Note. (1 = female; 2 = male)

The hypothesis that University Honors Program students would like the Artistic area the least of all activities was proven false. The total sample mean for Artistic Activities was 6.15,

with a standard deviation of 3.150. The minimum was 1 and the maximum was 11. The mode was 8. Contrary to the hypothesis, Artistic Activities ranked 3rd most liked by the total sample.

In fact, the area liked least by the sample was Conventional. Half of the sample selected the fewest number of boxes indicating areas of enjoyment in the Conventional category. The mean score for Conventional Activities was 3.40 with a standard deviation of 2.798. The minimum for this category was 0, while the maximum was 9.

Furthermore, the hypothesis that the female (n=10) and male (n=10) population would not differ on their least favored activities was rejected. The Activity area that is least favored by the females is the Realistic area, with a mean of 3.20 and a standard deviation of 3.521. The minimum was 0 and the maximum was 10. The male population overwhelmingly (80%) rated the Conventional area as their least favored, with a mean of 2.40 and a standard deviation of .833. The minimum was 0, while the maximum was 9. The mode was 0. Both hypotheses considering the least favored Activities were rejected.

$H_0$3. The category of competencies University Honors Program students have:

1. The category of competencies University Honors Program students have most is investigative.
2. There will be no difference between the competencies female and male University Honors Program students have most.
3. The category of competencies University Honors Program students have least is artistic.
4. There will be no difference between the competencies female and male University Honors Program students have least.

The Competencies section contained the same six areas related to personality typology as the Activities portion did. Participants were asked to indicate proficiency for a skill or ability by marking Y. On the other hand, participants were directed to select N for items they were not proficient at or had not experienced. Like the Activities section, there were eleven items for each area.

The type of competency most often ranked number one in this section was Investigative. The mean for the group sample was 8.50 with a standard deviation of 2.395. The minimum for the Investigative Competencies section was 4 and the maximum was 11. The mode was 10. This gives credence to the hypotheses that University Honors Program students' greatest area of competency is Investigative. The hypothesis was accepted for sub-hypothesis 1 of $H_0 3$.

The hypothesis that female and male University Honors Program students would share Investigative competencies as their strongest area was accepted. Female students had a mean of 9.20 and a standard deviation of 2.150. The minimum for females was 4 while the maximum was 11. The mode for the female sample was 10. The male sample had an Investigative competency mean of 7.80 with a standard deviation of 2.530. The minimum for the male population was 4 and the maximum was 11. There were three modes: 5, 8, and 11.

Artistic competencies were perceived to be the area in which University Honors Program students would rate themselves the least competent. This hypothesis was rejected, as the Artistic area proved to be one of the stronger areas. Artistic competencies had a mean of 5.60 and a standard deviation of 2.604. The minimum was 1 and the maximum was 9. There were two modes for the group: 5 and 9. The Artistic competencies were ranked the 2nd highest among the six competency categories.

Most often receiving the lowest score in this section was Realistic. The group sample mean was 4.25 and the standard deviation was 2.954. The minimum was 0 and the maximum was 11. The mode was 2, and was shared by five members of the sample.

Both male and female groups had Realistic receiving the most minimum scores in the competencies section. The female sample had a mean of 4.20 with a standard deviation of 2.7. The minimum for the female sample was 0 and the maximum was 8. The mode was 2. Male participants' responses resulted in a mean of 4.30 and a standard deviation of 3.335. The minimum for the male participants was 1 and the maximum was 11. Therefore, the hypotheses regarding the lowest competency as Artistic was rejected, while part 4 still holds true in that the male and female participant groups had the least competency in the same area. Table 8 reflects this discussion.

Table 8

Group Statistics for Competencies

	Sex	*N*	Mean	*SD*	*SE* Mean
Realistic Competencies	1	10	4.20	2.700	.854
	2	10	4.30	3.335	1.055
Investigative Competencies	1	10	9.20	2.150	.680
	2	10	7.80	2.530	.800
Artistic Competencies	1	10	6.30	2.627	.831
	2	10	4.90	2.514	.795
Social Competencies	1	10	8.00	1.633	.516
	2	10	7.10	3.143	.994
Enterprising Competencies	1	10	7.60	2.675	.846
	2	10	6.30	2.791	.883
Conventional Competencies	1	10	7.30	2.751	.870
	2	10	6.60	2.633	.833

Note. (1 = female; 2 = male)

$H_0$4. The occupations that interest or appeal to University Honors Program students:

1. The occupations that interest or appeal to University Honors Program students most are investigative.
2. There will be no difference between the occupations that interest or appeal to female and male University Honors Program students most.
3. The occupations that interest or appeal to University Honors Program students least are artistic.
4. There will be no difference between the occupations that interest or appeal to female and male University Honors Program students least.

The survey listed 14 occupations under each of the six types; R, I, A, S, E, C. Participants simply checked those that they would be interested in. The hypothesis for the sample (N=20) indicated that the area of most interest would be in Investigative occupations. The Investigative area of occupations had a mean of 4.50 and a standard deviation of 4.274. The minimum in this category was 0 and the maximum was 12. The mode for Investigative occupations for the total sample was 0, as determined by four students. The paired Investigative occupations with Social occupations, ranked second in preference.

The highest preference for Occupations belongs to the Artistic category. With a mean of 5.10 and a standard deviation of 4.103, Artistic was ranked number one in this area of the survey. The minimum was 0, while the maximum was 14. The mode for the group was three, given by four participants of the study. Twelve and 10 were both given by two participants each in this category. The hypothesis that Investigative occupations would be favored most has been rejected.

However, it is important to note that the female sample in this study did prefer Investigative occupations. The female mean for Investigative occupations was 5.90 with a standard deviation of 4.040. The minimum was 2 and the maximum was 12. The mode was 10. The male sample had a mean of 3.10 in Investigative careers with a standard deviation of 4.228. The minimum in this category was 0 and the maximum was 11. The mode was a telling 0, with four male students not selecting any Investigative careers they would enjoy. The female and male samples do not share their preferences for occupations, rejecting the second portion of $H_0$4**.**

In light of the occupational preferences, clearly the hypothesis regarding the least favored occupation type has been rejected for this sample. It was hypothesized that the Artistic occupations would be favored least. However, Artistic occupations were the most favored occupations. The mean for the Artistic occupations was 5.10 with a mean of 4.103. The minimum was 0 and the maximum was 14, representing the greatest possible range. The group mode was three.

The Realistic occupations were favored the least for the total sample. The mean for the group was 1.55 and the standard deviation was 1.701. The minimum was 0 while the maximum was 5. The mode was a telling 0, with nine participants not checking any Realistic occupations they are interested in.

As illustrated by Table 9, the hypothesis that female and male University Honors Program students would have the same least favored occupation category was accepted. The female group overwhelmingly indicated their aversion to Realistic occupations, with 70% indicating this was their least favored set of occupations. The mean in this area for females was 1.10 with a standard deviation of .458. The minimum was 0 and the maximum was 3. The mode was overwhelmingly 0, obtained by six of the female participants. The male participants also

responded that the Realistic occupations were the least suiting. The mean for the male participants in the Realistic occupations category was 2.00 with a standard deviation of 1.886. The minimum was 0 and the maximum was 5. The mode was 0, identical with the female mode.

Table 9

Group Statistics for Occupations

	Sex	*N*	Mean	*SD*	*SE* Mean
Realistic Occupations	1	10	1.10	1.449	.458
	2	10	2.00	1.886	.596
Investigative Occupations	1	10	5.90	4.040	1.278
	2	10	3.10	4.228	1.337
Artistic Occupations	1	10	4.90	3.957	1.251
	2	19	5.30	4.448	1.407
Social Occupations	1	10	5.90	3.900	1.233
	2	10	3.10	3.695	1.169
Enterprising Occupations	1	10	2.20	3.882	1.227
	2	10	2.60	3.134	.991
Conventional Occupations	1	10	2.30	3.129	.989
	2	10	2.20	3.736	1.181

Note. (1 = female; 2 = male)

The Self-Estimates section allowed participants to rate themselves on a 1 to 7 point scale in the following areas: Realistic-mechanical ability and manual skills, Investigative-scientific ability and math ability, Artistic-artistic ability and musical ability, Social-teaching ability and understanding of others, Enterprising-sales ability and managerial skills, and Conventional-clerical ability and office skills. The hypotheses regarding the Self-Estimate area are as follows:

$H_0$5. University Honors Program students rate themselves compared with other persons their own age in abilities and skills:

1. University Honors Program students rate themselves compared with other persons their own age in mechanical ability as average.
2. There will be no difference between how female and male University Honors Program students rate themselves compared with other person their own age in mechanical ability.
3. University Honors Program students rate themselves compared with other persons their own age in scientific ability as high.
4. There will be no difference between how female and male University Honors Program students rate themselves compared with other person their own age in scientific ability.
5. University Honors Program students rate themselves compared with other persons their own age in artistic ability as below average.
6. There will be no difference between how female and male University Honors Program students rate themselves compared with other person their own age in artistic ability.
7. University Honors Program students rate themselves compared with other persons their own age in teaching ability as average.
8. There will be no difference between how female and male University Honors Program students rate themselves compared with other person their own age in teaching ability.

9. University Honors Program students rate themselves compared with other persons their own age in sales ability as average.
10. There will be no difference between how female and male University Honors Program students rate themselves compared with other person their own age in sales ability.
11. University Honors Program students rate themselves compared with other persons their own age in clerical ability as average.
12. There will be no difference between how female and male University Honors Program students rate themselves compared with other person their own age in clerical ability.
13. University Honors Program students rate themselves compared with other persons their own age in manual skills as average.
14. There will be no difference between how female and male University Honors Program students rate themselves compared with other person their own age in manual skills.
15. University Honors Program students rate themselves compared with other persons their own age in math ability as above average.
16. There will be no difference between how female and male University Honors Program students rate themselves compared with other person their own age in math ability.
17. University Honors Program students rate themselves compared with other persons their own age in musical ability as below average.

18. There will be no difference between how female and male University Honors Program students rate themselves compared with other person their own age in musical ability.
19. University Honors Program students rate themselves compared with other persons their own age in understanding of others as average.
20. There will be no difference between how female and male University Honors Program students rate themselves compared with other person their own age in understanding of others.
21. University Honors Program students rate themselves compared with other persons their own age in managerial skills as average.
22. There will be no difference between how female and male University Honors Program students rate themselves compared with other person their own age in managerial skills.
23. University Honors Program students rate themselves compared with other persons their own age in office skills as average.
24. There will be no difference between how female and male University Honors Program students rate themselves compared with other person their own age in office skills.

There are 12 skills and abilities in the Self-Estimates section. The booklet visually indicates that one is low, four is average, and seven is high. There are numbers available between these markers to circle as well. There is value in knowing where on the continuum the University Honors Program students see themselves compared with others their own age. A high

flat line across code areas could implicate multipotentiality. Furthermore, an indication of some areas this population has common exceptionalities in may be telling.

The mean self-estimate for mechanical ability was 3.6 for the University Honors Program sample (*N*=20). The minimum was 1 and the maximum was 6. The mode for the survey group was 3. The hypothesis that University Honors Program students would estimate themselves as average was rejected, as most students ranked themselves below average.

Both female and male subgroups had the same average and also range. Therefore, the indication is that both the total sample and also both male and female groups rated themselves as slightly below average in mechanical ability. Therefore, the hypothesis that there would be no difference in how they estimated themselves in mechanical ability is accepted, even through the first hypothesis was rejected.

In scientific ability, the average score for the sample (*N*=20) was 5.3. The minimum was 1 and the maximum was 7. However, the mode was seven, indicating that many of the participants rated themselves as high. This does indicate that the population considers themselves to be above average, but not necessarily high. Therefore, the hypothesis that University Honor Program students they rank themselves as high is rejected.

There was a difference between the female and male responses. The female sample group (*n*=10) had a mean of 5.9, indicating well above average ability. The minimum was 4 while the maximum was 7 out of a possible. The mode for the female group was overwhelmingly seven, indicating they considered themselves as high. On the other hand, it was surprising to learn that the male sample group (*n*=10) had a mean of 4.7, indicating only slightly above average scientific ability. The lowest male response was 1 and the highest was 7. Fifty percent of the female participants gave themselves the highest rating, while only one male gave

himself a seven. Therefore, since there is more than one point between the two groups, the second hypothesis, that they rank themselves in the same way, is rejected. The female sample group rated themselves well above average, while the male participants rated themselves only slightly above average when compared with their peers.

Artistic ability was hypothesized to be below average for the sample (*N*=20) as well as the female and male groups. The mean of the sample was 4.7, indicating slightly above average results. The mode for the Honors Program students was six, indicating that there are several participants with well above average artistic ability. The female average was 4.7 with a minimum of 2 and a maximum of 6. The male group had a mean of 4.8. The minimum was 2 and the maximum was 7. There was not a large difference between the male and female groups, both rating themselves as slightly above average. In light of this, the hypothesis that the female and male groups would not differ in their self-estimates of artistic ability is accepted. Both groups rated themselves as slightly above average.

Teaching ability was theorized to be average, without any significant differences between female and male participants. A mean of 5.3, equal with the group's science estimates, was revealed. The minimum was 3 and the maximum was 7. The mode was 7. The group considers itself above average in teaching ability, disproving the hypothesis.

Female students estimated themselves slightly higher in this area. The mean for the female group was 5.5 with a minimum of 3 and a maximum of 7. The mode score for female students was seven, indicating high teaching ability. Four of the 10 female students gave themselves this rating. The male group estimated themselves also as above average in teaching ability. The mean was 5.1 and the minimum was 3. The maximum was 7, and the mode for the

male group was six, with three such responses. Therefore, the hypothesis that the subgroups would not estimate themselves differently in teaching ability is accepted.

Despite the hypothesis that they would estimate themselves of average sales ability, the sample (*N*=20) rated themselves below average. The average was 3.45. Only two of the participants rated themselves as high in this area. The minimum was 1 and the mode was three, with seven of the respondents falling below this self-estimate. The hypothesis for sales ability has been rejected.

Both groups estimated themselves as below average in sales ability. The female sample mean was 3.5. The minimum was 2 and the maximum was 7, with only one respondent indicating this high ranking. The mode was 3. The male population mean was 3.4 with a minimum of 1 and a maximum of 7. Like the female group, only one male participant ranked themselves this way. The similarity in estimating themselves as below average in sales ability has caused hypothesis $H_0$5 number 5 to be accepted.

Clerical skills, hypothesized to be average, did come out this way in practical terms for the sample (*N*=20). The arithmetic mean of 4.35 revealed a close match with the hypothesis. The minimum was 1 and the maximum was 7. The mode was 4. The hypothesis was accepted for the average estimation of University Honors Program students.

However, there was a significant difference in the rating between female and male respondents. The female group (*n*=10) mean was 4.9, while the male group (*n*=10) had a mean of 3.8, indicating a below average rating. The female group had a minimum of 4 and a maximum of 6. The mode for this group was 4, with 6 slightly behind. The male group, however, had a mean of 3.8 and a minimum of 1. The maximum, relayed by only one

participant, was 7. The mode was 4 for this group, although the group had many low numbers. Therefore, the hypothesis of similarity between the male and female groups has been rejected.

The sample (*N*=20) considered themselves about average in manual skills. The mean for the group was 3.85. The minimum was 1 and the maximum was 7. The mode was 4, held by 7 of the students. It is also of note that 13 of the students rated themselves at or above average. The range has reduced the mean. The hypothesis that University Honors Program students would estimate themselves as average in this category has been accepted in light of the findings.

The female group (*n*=10) estimated that they were about average. The mean for the female subgroup was 3.5 for manual skills. The female population had only three respondents rate themselves as above average in this category. The minimum was 1 and the maximum was 6. This group had five rate themselves as at or above average. Therefore, it is concluded that this group estimates themselves to be about average. The male group (*n*=10) gave themselves an average rating overall. The hypothesis regarding similarity between the subgroups in their estimation of their manual skills was supported and accepted.

In mathematical ability, the sample was hypothesized to rate themselves as above average on the self-estimates scale. The group did consider themselves as above average in this category, with a sample (*N*=20) mean of 5.85. The minimum was 2 and the maximum was 7, with nine respondents giving themselves the highest rating. The mode was 7. The hypothesis was accepted.

Both groups rated themselves as above average in mathematical ability. The female sample mean was 5.8. The minimum was 2 and the maximum was 7. The mode was 7, with six females giving themselves a 7 in mathematical ability. The male sample estimate their ability to fall in the above average range also. The mean was 5.9. The minimum was 4 and the maximum

was 7, with three of the male participants giving themselves the highest estimation. The mode for the male group was 6. The similarity in their estimations caused hypothesis $H_0$5 number 16 to be confirmed.

The sample (*N*=20) was hypothesized to be below average in musical ability. Furthermore, it was believed that the groups would not vary in their musical ability. The sample (*N*=20) rated themselves slightly above average in this category. The overall mean was 4.8. The minimum was 2 and the maximum was 7. Four, five and six share the role as modes. The hypothesis has been rejected in light of this data.

The scores between females and males for this ability did vary, with the male sample perceiving themselves as having more musical ability. The female sample had a mean of 4.3; about an average rating. The minimum was 2 and the maximum was 7. The mode was 4. The male sample mean was 5.3, with a minimum of 3. The maximum was 7 and the mode 6. Four of the male participants estimated themselves as a 6. The hypothesis of similarity in musical ability is rejected on the basis of this data.

The category regarding understanding of others was the highest scoring of all self-estimates. The mean was 6.05 and the mode for the sample (*N*=20) was six. Almost half of the respondents noted they were well above average in understanding of others. The hypothesis that the sample would rate themselves as average was rejected.

While both female (*n*=10) and male (*n*=10) group means were above average, the female group varied in that they considered themselves slightly higher in this category. Females had a mean of 6.3 in this area and a minimum of 6. The maximum was 7. The mode was 6, with 7 of the female participants estimating themselves in this way. The male group mean was 5.8, which

is still above average. The minimum was 2 and the maximum was 7. The mode was 7. In light of their similarity, $H_0$5 number 20 is accepted.

The hypothesis for the self-rating of managerial skills was that University Honors students would consider themselves as average as compared with their same age peers. The sample (*N*=20) considered themselves as about average. The mean for the group was 4.85. The minimum was 1 and the maximum was 7, representing the greatest possible range. The mode was 5. In light of the data demonstrating above average managerial estimates, the hypothesis regarding an average rating by University Honors Program students has been accepted.

The female group had a mean of 5.1. The minimum was 3 and the maximum was 7. The mode was 5. The males had a mean of 4.6. However, it is important to note that one male outlier, rating himself a one, had a significant effect on the male average. The minimum was 1 and the maximum was 7. The male mode for managerial skills was 5. In light of this, the hypothesis that the University Honors Program females and males would be similar in their self-estimates of managerial skills has been rejected. The female sample was above average while the male sample was rated as average.

It was believed that the sample (*N*=20) would rate themselves as average in office skills. The results indicate a slightly above average rating of 4.85. The minimum was 2 and the maximum was 7. The mode was 4. In light of this, the hypothesis is accepted. The participants rated themselves in the average range.

Females (*n*=10) rated themselves as slightly higher than males (*n*=10) in this category. The mean was 5.0 and the minimum was 4. The maximum was 6, and was shared as the mode. The male subgroup had a mean of 4.7. The minimum was 2 and the maximum was 7. The mode for the male group was 4, which is an average rating. The male sample is considered in the

average range while the female category is considered in the above average range. The hypothesis regarding similarity of office skills has been rejected.

Table 10

Self-Estimates of Female and Male University Honors Students

	Sex	*N*	Mean	*SD*	*SE* Mean
Realistic Self-Estimates	1	10	7.30	3.234	1.023
	2	10	7.80	2.530	.800
Investigative Self-Estimates	1	10	11.70	2.263	.716
	2	10	10.60	1.776	.562
Artistic Self-Estimates	1	10	9.00	2.981	.943
	2	10	10.10	1.853	.586
Social Self-Estimates	1	10	11.80	1.398	.442
	2	10	10.90	2.846	.900
Enterprising Self-Estimates	1	10	8.60	2.503	.792
	2	10	8.00	3.496	1.106
Conventional Self-Estimates	1	10	9.90	1.524	.482
	2	10	8.50	3.342	1.057

Note. (1=female; 2= male)

After the individual self-estimates items were analyzed, the two items that corresponded to the code types for Realistic, Investigative, Artistic, Social, Enterprising, and Conventional were analyzed together. As demonstrated in Table 10, the value in both analyses is that there may be aspects of a code that are polarized for some participants. The Social category of the Self-Estimates section included teaching ability and understanding of others. This category received the overall highest numerical rating when all participants' scores were added and averaged. The average for the category was 5.68. Of a possible 280 estimate points, the Social

estimates added up to 227. Just slightly beneath this average was the average of the Investigative section with a mean of 5.57 and a score of 223 out of 280 estimate points. The Social self-estimates received a mean of 11.80 for the females and a mean of 10.90.

Overview of Results

The analysis of the survey data collected from University Honors Program students at Indiana State University was conducted in steps. There was only one exact match with the order of the three-letter self-perception Summary Codes and the code corresponding to a career aspiration. Three other participants had a match between the three letters they received as their Summary Codes and their career aspirations. For example, one female participant's Summary Code was AES, while the career she is interested is classified as ESA. This, although not a match in exact order, is still considered an appropriate match that she should consider. In fact, after looking up the Summary Code in its first order, Holland recommends you look under other combinations of your Summary Code (Holland, 1994, 1997).

The sample also had 11 members get an acceptable person-environment fit of two of three corresponding letters. Since some of these participants had close fourth letter codes. This was perceived as positive.

Furthermore, of the sample (N=20) only five did not have a match that would be considered productive. These participants had only one of the three Summary Code letters in common with their career aspirations. All participants had at least one letter in common between their aspiration codes and their self-perception Summary Codes.

The most common first letter for female career aspirations Summary Codes was I for Investigative. Five of the female sample (n=10) had an I as their strongest letter career aspiration code. Interestingly, four of these same five had an I in the first position of their Summary Code

based on their responses to the survey. This indicates the most overall strength of an area. The other had an I in the second position of her Summary Code.

The male sample group (n=10) had career aspirations that had an I for Investigative in the strongest location in their aspiration code three times. Two of these three also had Summary Codes that had I in the first position based on their survey answers. The other participant had an I in the second strongest location.

The most frequently appearing career aspiration code letter (in any order of the three-letter code) for the sample (N=20) was S for social. This was also true for the Summary Codes based on the participants' answers. This similarity is positive.

The least frequently appearing in the first (strongest) position of career aspiration codes was both C for Conventional and R for Realistic. However, two of the participants had codes that included one of these letters in the first position of their Summary Codes. A male student whose Summary Code had R in the first position had an aspiration code of IRE and a Summary Code of RIE. This is a positive match. One was a female student whose aspiration code was AES, but her Summary Code was CRS. This may become problematic for her, as not only is the strongest letter of her Summary Code not in the first, second, or third position, but she has only one letter that matches between her codes.

The Realistic and Conventional codes were seen the least of all the codes in both the career aspiration codes and the Summary Codes. It is important to note that many of the jobs associated with Summary Codes that begin with R or C do not require beyond a high school diploma and some technical school or some college (Holland, 1994, 1997). The participants in this research were all enrolled in a university that offers undergraduate through doctoral degrees.

It is important to note that a few of the participants did display high scores in multiple categories. These students enjoyed a lot of the activities, were competent in many areas, were interested in a variety of occupations, and possessed above average and high skills in several areas. These participants would be considered mulitpotenial. One participant received the following scores: R:37, I:17, A:46, S:45, E:30, C: 23. Usually the scores are much more spread out with a few clustered strongly on the higher end. Despite this potential challenge, the participant's aspiration code was SAE and his Summary Code was ASR. Since two of the three match, and E is also high, he has an excellent fit in this area.

Another student had a tie for last position of his Summary Code. He scored 37 for Artistic, a 32 for Social, and 20 for both Conventional and Social categories. Therefore, the Summary Code would be ASE/C.

Overall, it can be stated that several of the hypotheses were supported. While there was one ordinal match of a three-letter Summary Codes with an Aspiration Codes, three-fourths of the sample had a satisfactory fit according to Holland's criteria (Holland, 1994, 1997). There is a high interest in careers that are investigative. Furthermore, there is support that this population does contain a significant amount of skill and interest in the Investigative activities and occupations. On the other hand, there were some hypotheses that were rejected. The data indicated that the University Honors Program students have an above average interest in the Social and Artistic areas. It should also be noted that 18 of the participants had an E in their career aspiration codes, while 9 displayed this strength in the Summary Code.

CHAPTER 5

Discussion and Implications For the Future

This study explored the career aspirations and self-perceptions of University Honors Program students at Indiana State University. There are limitations of the sample size that impact the generalizability of the study to other Honors populations, and even to the total population of University Honors Program students at Indiana State University. However, valuable information was gained regarding the participants. Discussion of the findings, possible extensions to the knowledge base, and recommendations for future work follows.

Majors

The University Honors Program at Indiana State University contains majors from several areas. The participants in this study represented 19 majors, some in combination as double majors, including the following: Anthropology, Aviation Management, Chemistry, Criminology, Elementary Education, English, English Education, Health, History, Interior Design, Language Studies, Legal Studies, Math, Math Education, Music Education, Political Science, Pre-Medicine, Professional Aviation Flight Technology, and Psychology. Six members of the sample had double majors. The two female double majors included the following combinations: Math and Math Education, Political Science and Legal Studies. Four male double majors had the following combinations: History and Language Studies, Criminology and Psychology, Political Science and Legal Studies, and Aviation Management and Professional Aviation Flight

Technology. In relation to $H_0$1, only one participant had an exact match between his Career Aspiration Code and his Self-Perceptions Summary Code. However, there were three whose typology letters were the same, although in different sequence. Furthermore, in consideration of what Holland considers an acceptable match of two or more, there were a total of 15 participants with two or more letters in common between their codes. Five members had codes that did not correspond by two or more letters. A discussion of these findings is crucial to understand their relevancy to the individuals, previous knowledge, and future implications.

STEM Majors

The most popular major in this study was Chemistry. Four members of the sample were Chemistry majors. Three of the Chemistry majors were male. This correlates with what was found in earlier studies regarding the greatly disproportionate number of male to female students in science, technology, engineering, and mathematics (STEM) programs and the difficulty and dislike many female students may feel about chemistry (Kerr & Kurpius, 2004; Mendez & Crawford, 2002; Subotnik et al., 2001). This would be expected based on the results of gender studies of gifted students in science (Subotnik et al., 2001).

However, there is a contrary hint gleaned from this research. The two participants majoring in Math were both female, as well as the Health and Pre-Medicine majors. Of the 10 female participants, five had majors that fit into a STEM area, including Math Education, Health, Chemistry, Pre-Medicine, and Math/Math Education. Four males had majors that fit into a STEM area, including three in chemistry and one in Aviation Management/Professional Aviation Flight Technology. In light of this, a blanket statement that there are more males than females in STEM areas is not true for this sample.

STEM Majors' Career Aspirations and Self-Perceptions Summary Codes

The career aspirations of these students reflected their STEM interests. All five of the females pursuing STEM related majors had career aspirations that reflected interest in STEM. Career aspirations included Dietician, High School Math Teacher, Math Professor, Oncologist, and Ophthalmologist. While four of the participants' Career Aspiration Codes contained I for Investigative, one participant's code did not. This is most likely due to that fact that *The Occupations Finder* booklet did not list math teacher and only had secondary teacher as a classification that fit the Math Education major. These women are pursuing STEM majors and have STEM career aspirations that complement their majors. This relates to the results of a study that situated females who pursue STEM majors and careers as being committed to their area of interest (Subotnik et al., 2001). However, it is not discernable if these STEM majors will actually enter and stay in STEM careers.

Of the female STEM majors, four of the five participants had Self-Perceptions Summary Codes that had an acceptable match with their Career Aspiration Codes from the *Self-Directed Search (SDS)* instrument. The young woman double majoring in Math and Math Education had a Career Aspiration Code of SEI and a Self-Perceptions Summary Code of ISE. Three of the three letters aligned, although not a mirror image in order. Three others, the Pre-Medicine, Health, and Chemistry majors, had two of three letters that corresponded. Of importance is that the four STEM area majors who had codes that corresponded by two or three letters, all had I for Investigative in both their Career Aspiration Codes and their Self-Perceptions Summary Codes. Investigative qualities are associated with STEM careers and personalities (Holland, 1994).

The Math Education major is considered by this researcher to be part of the STEM majors group. She had a Career Aspiration Code of SAE and a Self-Perceptions Summary Code

of SIC. This, while on paper not a match, did indicate that her major, Math Education, did match her qualities in that I was associated with mathematics. I do believe that the lack of further distinction in *The Occupations Finder* booklet for the SDS may be the cause of the distance in her code match. Elementary school teacher and secondary school teacher are listed. However, this participant's aspiration to be a high school *math* teacher was not fully matched using *The Occupations Finder* booklet.

Information related to this female's case was found from a study related to use of vocational tests with females gifted in mathematics by Hollinger (1986). It was found that females gifted in mathematics had higher than average scores in both Investigative *and* Conventional areas. This participant in particular did indeed have high scores in both Investigative and Conventional areas. (It should be noted that her highest score was in the Social area, which certainly corresponds to an interest in teaching.) Hollinger says that this combination could be problematic in that the Conventional personality type often has trouble swimming against norms, including gender expectations (Hollinger, 1986). While the ability and acceptance of women in STEM fields has certainly gotten better in the past decade, there is still more involvement in math and science by men than by women (Kerr & Kurpius, 2004; Mendez & Crawford, 2002; Subotnik et al., 2002). This may be the case of a student caught between an internal struggle with norms, or the lack of distinction in *The Occupations Finder*. This certainly needs closer examination with gifted female math students to discern.

Likewise, the four males who had STEM majors had career aspirations that were linked to a STEM area. All of their career aspiration had an I for Investigative in them. Their career aspirations were Chemist, Flavor Chemist, Physical Therapist, and Pilot. The one perfect match between a Career Aspiration Code and a Self-Perceptions Summary Code was obtained by one

of the male Chemistry majors who would like to be a Flavor Chemist. His Career Aspiration Code of IRE matched his Self-Perceptions Summary Code of IRE in letter and sequence. A male double major pursing Aviation Management and Professional Aviation Flight Technology obtained a match of the three letters, although not in the same sequence. His Career Aspiration Code was IRE and his Self-Perceptions Summary Code was RIE. The other two male STEM majors, both majoring in chemistry, had a match of two letters between their codes. Importantly, like all but one of the female STEM majors, there was an I for Investigative in both codes of the STEM majors, indicating a high interest in STEM areas. However, it is important to note that one of the male STEM majors did not have a good match between his codes. His aspiration code was IRE and his Self-Perceptions Summary Code was ISA.

The STEM majors in this study had a positive correlation between their career aspirations and their interests, activities, occupational interests, and self-estimates from the *Self-Directed Search* instrument. This is reassuring in that they are approaching STEM from three areas of focus; their personalities and attributes, their majors, and their corresponding career aspirations. One participant from the STEM majors may have turmoil in her career path. As noted, this researcher feels that The Occupations Finder should include more detail in the delineation among teaching specializations. There is difficulty in that the Summary Code from an English major who wants to teach high school English would obtain the same Summary Code as a Math major who wants to teach high school math. Even in this study, they both had to be classified as SAE under *secondary school teacher*. Since *The Occupations Finder* booklet is what is obtained by students, counselors, and others who wish to search for career options, this book should be updated with research into the characteristics of successful teachers of various subjects in secondary education.

On the other hand, the male Chemistry major with a mismatch may be surprised by his career path. His Artistic and Social rankings were high, and based off of occupational studies by Holland (1994), he may not be happy in this career.

Other Majors

The remaining participants had majors in other disciplines. Females that were not STEM majors included majors in Anthropology, Elementary Education, Interior Design, and a dual major of Political Science and Legal Studies. The career aspirations of these females did relate to their majors.

Male majors that were not STEM related included English, English Education, Music Education, and three dual majors. Criminology and Psychology, History and Language Studies, and Political Science and Legal Studies were the three pairings. Of these six participants, five had career aspirations that related to their majors. There was one participant whose major did not appear to align with his career aspiration. His major is Music Education and his career aspiration is to be an Army Special Forces Officer.

The alignment of the majors and career aspirations portrayed in Table 11 can be interpreted to mean that almost all of these participants have an aspiration that links with the higher education degree they are seeking. Of all the participants, only one had an aspiration that seemed unrelated to his major. It is possible that they have been exposed to career fairs and opportunities to explore career choices that are reflective of their learning in certain degree fields. Although not available in all areas, counselors who specialize in gifted and talented counseling and/or consultation do help educate and guide such students (Peterson, 2007).

Table 11

Other Majors and Career Aspirations

Major(s)	Career Aspiration
Anthropology	Archeologist
Anthropology	Linguistic Anthropologist
Criminology and Psychology	Law Enforcement Officer
Elementary Education	Elementary School Teacher
English	Creative Writer
English Education	High School English Teacher
History and Language Studies	Classics Professor
Interior Design	Designer
Music Education	Army Special Forces Officer
Political Science and Legal Studies	Judge
Political Science and Legal Studies	Lawyer

Other Majors' Career Aspiration and Self-Perceptions Summary Codes

While all but one member of the study had a career aspiration that was not in the same area as his major, the others did align. Furthermore, most of these individuals also had a match between their Career Aspiration Codes and Self-Perceptions Summary Codes. Recall that the Self-Perception Summary Codes reflect the activities, interests, and skills of each participant (Holland, 1994).

Three of the five females not majoring in a STEM area had a positive match between the two codes. The Political Science and Legal Studies dual major with the goal of being a judge

had an excellent match of three out of three letters. Her Career Aspiration Code was ESA while her Self-Perceptions Summary Code was AES. The Elementary Education major whose aspiration is to be an elementary school teacher had a Career Aspiration Code of SAE and a Self-Perceptions Code of ASI, indicating a match of two letters. Her codes both contained S for Social and A for Artistic. There were two females majoring in Anthropology. Both of their Career Aspirations fell under the code of IRE. However, only one of these females had a Self-Perceptions Summary Code that had a positive level of correlation with the IRE Code. EIS was the Summary Code for this participant.

Of the male participants, six represented majors that were not in STEM areas. Five of these male participants had acceptable matches of two letters between their codes. The Political Science and Legal Studies major had a Career Aspiration Code of ESI and a Self-Perceptions Summary Code of ECS. The English major's Career Aspiration Code was AIE and his Self-Perceptions Code was SAI, indicating a positive match. Likewise, the English Education major, the Criminology and Psychology major, and the Music Education major had codes that corresponded by two letters. Interestingly, the Music Education major, whose aspiration is to be a U.S. Army Special Forces Officer, has a typology that corresponds to his career aspiration. The Career Aspiration Code was ERS, while his Self-Perceptions Summary Code was ASE/C.

Like the STEM majors, most of the participants pursuing degrees have career aspirations that correspond with their majors. Furthermore, they also have an acceptable match between their Career Aspiration Code and their Self-Perceptions Summary Codes. While the Summary Codes are a guide, this should be interpreted positively (Holland, 1994).

Mismatched versus Multipotential

Multipotentiality is common among gifted and talented individuals (Greene, 2006; Rysiew et. al., 1999). There can be great pleasure arrived from being outstanding in several areas, although it this can also be overwhelming. For some gifted and talented young people, multipotentiality makes deciding on a career a stressful experience (Peterson, 2007; Robinson et al., 2007; Rysiew et al., 1999).

Five participants did not display a desirable match between their Career Aspiration Codes and their Self-Perceptions Summary Code, also known as a typology. It was discovered that some of these participants could be considered to be mismatched, while others would fall into the multipotential category. Implications for each of these individuals were presented as a surface mismatch that can be misleading.

Two of the surface mismatches were STEM majors previously discussed. In the case of the male Chemistry major whose codes did not match, his scores were examined to determine if his category scores were similar or high in several categories. This was not the case. In fact, his scores were quantitatively different in the three categories of his Summary Code and the three that were not. His Summary Code of ISA was constructed based on his scores in each category: Investigative-46, Social-33, Artistic-24, Realistic-15, Enterprising-11, and Conventional-11. The career he wishes to pursue has a code of IRE. It is easy to see that this individual is at risk for a mismatch in his career given this information. Although this individual would not necessarily need to give up on this goal, he may want to consider investigating the career more to ensure it would be a good fit (Holland, 1994).

The other STEM related major was the female whose major is Math Education. *The Occupations Finder* code for her aspiration to be a high school math teacher was SAE. It was

listed as secondary teacher. As formerly mentioned, I believe the booklet should be expanded to include delineations among they types of secondary educators. This female's typology was SIC, revealing strong Investigative qualities linked to STEM careers. Her high Social score, associated with educational professions, also reveals that her aspiration may be well-suited for her. In this case, I believe it was a mismatch of the code, not the individual with her career aspiration.

Three surface mismatches were non-STEM majors whose codes were investigated. Two females and one male participant did not have an acceptable match between their Codes from this category. The participant whose aspiration is to be a linguistic anthropologist had a Self-Perceptions Summary Code of IAS. The Career Aspiration Code was IRE. It was examined to see if this participant had a high score in either R or E. These scores were actually several points below all three of the letters in her actual code. Again, in this situation she would be referred by the SDS to look more closely at the career she has chosen. Perhaps increased career education and possible job shadowing would be helpful (Robinson et. al., 2007). On the other hand, it has been noted in some research that because of societal influences on gender expectations, females tend to receive higher scores in SAC and men in IRE (PAR, 2009). While this may be true, the scores reflect a vast deficit in this area that may be problematic even given gender influences.

The female Interior Design major had a Career Aspiration Code of AES. However, her Self-Perceptions Summary Code was a CRS. This was seemingly a mismatch. However, upon closer examination of her survey, she had relatively close scores in all the categories. This was an example of someone who displays multipotentiality. Her highest scores were Conventional. In light of the close proximity of all her categorical scores, her preparation as an Interior Design

major and accompanying aspiration may be a good match. Table 12 reflects this participants' scores in each area.

Table 12

Multipotential Female

Category	Score
Realistic	28
Investigative	21
Artistic	22
Social	27
Enterprising	25
Conventional	39

Likewise, the young dual History and Language Studies major also had a surface mismatch (Table 13). His Career Aspiration Code was SEI and his Self-Perceptions Summary Code was EAC. It is to be acknowledged that he has a very high score in Enterprising, and some of his other scores, including I and S, were close to the scores on A and C. Therefore, this individual may also be multipotential and end up being successful and content as a Classics Professor.

Table 13

Multipotential Male

Category	Score
Realistic	22
Investigative	29
Artistic	32
Social	30
Enterprising	39
Conventional	31

In light of the examination of the five participants and a review of literature on multipotentiality, it was determined that only two of the participants are at risk for a mismatched person-environment fit with their current career aspiration. One female's Summary Code did not match the Aspiration Code, but this was most likely due to a lack of specificity in *The Occupations Finder* booklet that accompanies the *Self-Directed Search*. Two of the participants with surface mismatches appear to be multipotential. While this can be difficult, their scores reflect interest, skill, ability in the areas of need for the careers they are aspiring to have.

Categories in Career Aspiration Codes and Self-Perception Summary Codes

As predicted for $H_0$2 and $H_0$3, the category of activities and competencies that University Honors Program students who participated favored and possessed most was Investigative. This serves to reinforce the emphasis of STEM education for gifted and talented students. The movement has been reinforced with programming and funding that provides experiences and cultivation in this area (Jolly, 2009). The attention to STEM skill development among gifted and

talented females has received a lot of attention, as the rates of STEM jobs has eluded gender equilibrium (Karnes & Stephens, 2002; Kerr & Kurpius, 2004; Mendez & Crawford, 2002; Subotnik et al., 2001). Interestingly, when grouped by gender, the male sample preferred Enterprising activities more than Investigative. However, due to the sample size, this difference is not meaningful.

On the other hand, the sub-hypotheses for both $H_0 2$ and $H_0 3$ predicted that Artistic would be the least favored of the Activities and Competencies sections. The results indicated that these hypotheses should be rejected. In fact, Artistic was the category ranked third by the sample.

Despite a decline in art programs in favor of more *core* classes, especially as budgets get cut (Robinson et al., 2007), the Artistic activities and Competencies for this group were not found to be the least favored. It was noted that many students stated they could play an instrument well. This correlates with a study presented by the National Association for Music Education's that showed a correlation between music coursework and high SAT scores (MENC: The National Association for Music Education, 2006). Those in the University Honors Program take the SAT or ACT and demonstrate excellence before entrance into the program (University Honors, 2009). The University Honors Program students who participated, aside from one student, do like some art activities and have some competency in this area.

Instead, the group as a whole disliked Conventional Activities the most. Realistic was the least favored category of Activities for females and Conventional was overwhelmingly the least favored category of Activities by the male group. This correlates to the gender differences sometimes seen on the assessments, with women obtaining codes of SAC more than men and men obtaining codes of RIE more often than women (Holland, 1994).

Realistic was the least favored Competency category by both male and female participants. This does point toward the fact that many of the Summary Codes beginning with C and R on average require a lower amount of education than the other categories. Although some of them require college training or an advanced degree, most of the careers require a lower level of education (Holland, 1994). These students are already participating in college degree programs.

The hypothesis ($H_0$4) that the University Honors Program students prefer Investigative Occupations most was rejected for the total sample. Occupations that interest or appeal to the University Honors Program participants as a mixed gender sample most belong in the Artistic category. The list included occupations such as musician, actor/actress, artist, and singer.

On the other hand, the female sample did favor Investigative and Social Occupations more than Artistic Occupations. This is interesting, given the information provided from Holland's work and the Self-Directed Survey revelation that women obtain more SAC than men do as a result of society's influence on career choice (Holland, 1994; PAR, 2009). Recall that several of the gifted and talented participants indicated they played an instrument well. Since the sample is relatively small, it would be interesting to see if this is a widespread trend at Indiana State University or among gifted Honors students at other colleges.

Based on the Self-Estimates section of the Self-Directed Search, the University Honors Program sample conveyed that they were well above average, above average, average, or below average in various RIASEC abilities and skills. Several of the subportions of $H_0$5 were accepted and several were rejected. Table 14 indicates how female and male participants rated themselves (as compared with persons their own age).

Table 14

Group Self-Estimates

Category	Females	Males
Realistic	Below Average	Below Average
Mechanical Skills	Average	Average
Manual Skills		
Investigative	Above Average	Average
Scientific Ability	Above Average	Above Average
Math Ability		
Artistic	Above Average	Above Average
Artistic Ability	Average	Above Average
Musical Ability		
Social	Above Average	Above Average
Teaching Ability	Well Above Average	Well Above Average
Understanding of Others		
Enterprising	Below Average	Below Average
Sales Ability	Above Average	Average
Managerial Skills		
Conventional	Above Average	Average
Clerical Ability	Above Average	Average
Office Skills		

While there are some individuals that are gifted and talented in several areas, there are also many who are gifted and talented in only one or two areas (Roberts & Inman, 2007; Robinson et al., 2007; Winebrenner, 2001). The University Honors Program sample estimated themselves to be above average in several categories. While this on the whole is not surprising, it was not expected that the male participants would rate themselves as *average* in scientific ability. The female population estimated that they were *above average* in this category. The focus on STEM curriculum with gifted populations makes this a noticeable contradiction

between the female and male samples. On the other hand, it is also noticeable that the two genders agreed on their ratings in many of the areas. Sales Ability and Mechanical Ability were both estimated to be *below average* by the sample, while Math Ability, Artistic Ability, and Teaching Ability were all estimated to be *above average*. Understanding of Others was estimated to be *well above average* by both females and males. Several of the participants, in an effort to follow the instructions to rate themselves how they think they really are when compared with their same age peers, had to also *not* follow part of the instructions for the *Self-Directed Search*. The Self-Estimates section tells participants to "avoid rating yourself the same in each ability" (Holland, 1994, p. 9). The scale only goes from one to seven, and there are six areas in each of two boxes for RIASEC estimates. This poses a predicament for gifted and talented users who may be average or above average in many abilities and skills. This section of the assessment may not be the best suited for gifted and talented users.

Millennials

These results lead into a necessary discussion of where these individuals are situated in time. As previous generations, Millennials have defining characteristics. Born in the early 1980s through around 2003, these individuals may be different in their approach to life (Denham & Gadbow, 2002; Winograd & Hais, 2008). The Millennials comprise a large, diverse group in America, and have grown to be a strong force in both the political and education climates (McGlynn, 2005; Winograd & Hais, 2008). Extensive research by Winograd and Hais (2008) led to the publication of *Millennial Makeover*. In this book, they have examined some of the characteristics of this population, and have found them to be very civic minded and socially connected. Internet, Facebook, MySpace, Twitter, not to mention cell phones, have made this a socially active and connected group in American history (Howe, 2005; McGlynn, 2005;

Winograd & Hais, 2008). This compliments the results of this study in that of the 20 Career Aspiration Codes, fourteen contained an S for Social qualities in the career aspiration. After taking the *Self-Directed Search*, it was revealed that seventeen of the participants had an S in their personal typology. Of the three whose code did not contain an S, two of the three had an S that was very close to the third letter that made it into the typology. This certainly corresponds to the social aspect of the new generation.

Another interesting aspect revealed from the SDS with this population was their interest in careers that have Enterprising qualities. Of the 20 participants, 18 had an E in their Career Aspiration Codes. However, only nine of the participants revealed typologies based on their interests, skills and abilities that contained an E. Management and sales occupations are classified as Enterprising. Examples of occupations participants listed that have an E in the first or second position include the following: Classics Professor, Designer, Judge, Law Enforcement Officer, Math Professor, Lawyer, and U.S. Army Special Forces Officer. Eleven other participants had an E in the third position of their Career Aspiration Codes. Only three females had an E in their Self-Perceptions Summary Code, while six males had codes with an E. With this population, those with multipotentiality should be considered. Of the two who displayed multipotentiality after reviewing their surface mismatches, one already had an E in both codes and the Interior Design major may be considered as having this characteristic in light of her scores.

Even given this, there still seems to be a disconnect between these codes. Some suggest the Millennial generation is impulsive and does not want to wait for their opportunity to be in leadership roles; they want *it* now (Howe, 2005). On the other hand, perhaps these individuals are looking into the far future to obtain admittance into strong Enterprising careers. Yet another

thought is that these individuals, with more information than ever, are prepared to learn the skills necessary to fill leadership roles in public and private sectors. Many Millennials already participate in civic and volunteer programs as creators and volunteers (Winograd & Hais, 2008). On the other hand, it is also possible that these students listed the career aspiration they hope to obtain after *paying their dues* as assistants and supportive roles. For example, perhaps the young woman who wants to be a judge will go on to law school and be a lawyer for ten years before having her own gavel. This is speculation, of course, and leads to an implication that more research is necessary to decode the career aspirations.

Recommendations

This researcher believes the University Honors Program at Indiana State University is in a favorable position to encourage gifted and talented students to pursue what they are interested in as well as what they are skilled in. This is not to say that someone who is interested in medicine but struggles with chemistry should never be allowed to enter the pre-med program. However, there is an indication that people do need to be able to carry out the functions of their positions to be satisfied (not to mention employable). In the case, perhaps support for this student in chemistry can be provided so that the student is able to pass the course and utilize the knowledge vested there.

Perhaps building in a counseling component would be beneficial. Although the results of the survey revealed that most of the students are pursuing well matched career aspirations, there were still some who were not pursuing careers that matched their skills, talents and interests. While extensions cannot be made to other institutions, and even to the larger population of gifted and talented Honors Program students at Indiana State University, this is still going to affect the lives of these individuals.

Perhaps the *Self-Directed Search* or another career guidance tool could be given to all incoming University Honors Program students. In fact, perhaps another tool could be created for the gifted and talented population to help address the multipotentiality issue faced by many gifted and talented students. Both freshmen and transfer students could benefit from taking such a survey.

If another survey is not available, the SDS could still be useful. The survey is inexpensive, costing only around two dollars per paper and pencil test. An internet version is available for about ten dollars, and gives the results via a printable report. A copy of The *Occupations Finder* could be kept on hand in the University Honors Program Office for reference. Furthermore, because the survey is self-directed, students can take it without needing to make an appointment at a counseling center to take the assessment. It is time and cost effective.

For students whose Summary Codes are matched or similar, this can be helpful. "The SDS is most useful when it reassures you about your vocational choice or reveals new possibilities worth consideration" (Holland, 1994, p. 12). The students can be encouraged by their results.

On the other hand, students whose codes don't match closely may need some guidance. This would be an instance when a resource, such as the Career Center at Indiana State University, might be helpful. Trained counseling professionals could be consulted to examine the results. If multipotentiality exists, perhaps the student is already on the right track. However, guiding students whose mismatch is not due to multipotentiality will be important. Perhaps finding the roots of the student's interest in a particular career will be helpful. Parental

and peer influences and expectations may have contributed to a career aspiration that the student is holding on to (Holland, 1994).

Another aspect to consider is that the student may not really understand what types of skills and activities go into being successful in the career they are pursuing. Setting up an appointment with a local individual who is already experienced in this career may help. An interview or date for job shadowing may be beneficial. When doing this, it is important to remember that matching a professional of the same background will help create a better environment for exploration and possible mentoring.

The University Honors Program can also utilize the findings from this research to aid in their course development. The social and investigative nature of many of the participants can be worked into community service projects that fit the current interdisciplinary model. Innovations from enterprising students, and those who would like to develop their skill in this area, can be exercised to grow their talents and fuel their passions in these community projects. Those with realistic skills would enjoy the physical aspect of community projects, while conventional tendencies would be greatly appreciated in the organizational aspects of the course projects. Perhaps if a course were drawn in and created using the current Sensor Model available on campus, using the science of learning in the learning of science, the students could work as Honors teams to complete community service based courses for credit. This is especially relevant given the nature of Millennials to be civic minded and goal oriented (Winograd & Hais, 2008).

In addition to course creation, there are options for extra-curricular activities. It is not surprising that many of the students enjoyed investigative activities. However, there are other areas for which participants conveyed enjoyment. One such area was the arts. Over half of the participants favored art enough that it was part of their Self-Perceptions Summary Code. This

certainly indicates that artistic extracurricular programming, including poetry, music, interpretive reading, sculpting, etc. should be offered on a regular basis. Offering weekend workshops in various arts may provide time for artistic students to express themselves, fuel their passion, and possibly develop new skills that will prove helpful. For those who are not pursuing an artistic career, the opportunity to appreciate and cultivate respect and engagement in the arts would be provided.

In conclusion, there are three main recommendations that stem from the findings of this research. First, University Honors students can receive confirmation or an opportunity to explore their aspirations as a result of taking a typology survey, especially one designed for gifted and talented populations. The *Self-Directed Search* instrument could be utilized with care if another reliable and valid survey is not available. This would be most helpful when entering the University Honors Program. Second, courses that fuel and build off of the talents and skills of the Millennial Honors students could be used in the community based on an interdisciplinary approach that is already appreciated in the Honors classrooms. Finally, fueling the interests of students in the arts, and also other areas, should be offered on a regular basis for the personal development of University Honors Program students at Indiana State University.

Limitations

The greatest limitation of this study was the small sample size. This prevented valid *t*-tests for significance to be run. This not only prevents generalizability of the findings to other University Honors Programs, but also to the population at Indiana State University. The findings were only applicable to the individuals who participated in the study. The small sample size prevented a determination of the degree to which the sample reflected the total population.

Possibilities for expanding the research to gain more insight and generalizability should be explored. One option would be conducting the research during several class sessions or at various times during the day. Incentives might be offered to increase participation. Furthermore, a method of online response might be considered.

While it was desirable to have greater participation, the results of the study did provide insight into the career aspirations and self-perceptions of the participants. The characteristics of these individuals correlated with some past research and also built on the gaining knowledge about Millennials as demonstrated in text in this chapter. The University Honors Program students who participated had distinct areas of interest and strength.

Future Research

This study was exploratory in nature. It utilized a well-known and trusted instrument in the field of counseling and career development with a gifted and talented population. The SDS was greatly beneficial in exploring the career aspirations and self-perceptions of the University Honors Program at Indiana State University. The results were indicative of some STEM related aptitudes and preferences. Perhaps a next step is to qualitatively approach the topic. Asking critical questions about how Honors students were influenced is a start. Additionally, the high interest levels and low interest levels in various areas should be explored. Were the students naturally all gifted in science and math before entering the gifted and talented program or were they influenced by heavy STEM focuses? Did these students have other interests that they pursued during their formative years? Many members of the sample expressed strong social and musical tendencies. How were these fostered and by whom? What was their gifted and talented education like before coming to Indiana State University?

It is easy to see why research leads to more research. This descriptive study provides justification into further research. Without knowing the aforementioned characteristics, it could be assumed falsely that these students are only strong in one area or that they are high in all areas. Importantly, having these students rate themselves reveals their own perspective of themselves. Each of the surveys told a story. There is room for researchers interested in gifted and talented education to pursue the outcomes at both comprehensive colleges and also technical and engineering schools.

REFERENCES

Belanger, J., & Gagné, F. (2006). Estimating the size of the gifted/talented population from multiple identification criteria. *Journal for the Education of the Gifted*, *30*(2), 131-163.

Clark. B. (2002). *Growing up gifted: Developing the potential of children at home and at school*. Upper Saddle River, NJ: Merrill Prentice Hall.

Denham, T. J., & Gadbow, N. (2002). *Literature review: Factors affecting the development of Generation X and the Millennials. Social factors affecting education*. (ERIC Document Reproduction Service No. ED 478488)

Fahlman, S. (2000). *Actualization of giftedness: Effects of perceptions in gifted adolescents*. Metagifted Education Resource Organization: Gifted Adolescents. Retrieved from http://www.metagifted.org

Ford, D. Y. (2000). Infusing multicultural content into the curriculum for gifted students. *Council for Exceptional Children*. Retrieved from http://www.cec.sped.org/AM/Template.cfm?Section=Home&CONTENTID=1879&TEMPLATE=/CM/ContentDisplay.cfm

Ford, D. Y. (2004). *Intelligence testing and cultural diversity: Concerns, cautions, and considerations*. Storrs, CT: The National Research Center on the Gifted and Talented, University of Connecticut.

Foust, R.C., Hertberg-Davis, H., & Callahan, C.M. (2009). *Students' perceptions of the social/emotional implications of participation in advanced placement and international baccalaureate programs*. Storrs, CT: University of Connecticut, The National Research Center on the Gifted and Talented.

Frequently Asked Questions About GATE. (2006). *The Gifted in Fremont*. Retrieved from http://tgifremont.org

Gentry, M., Peters, S., & Mann, R. (2007). Differences between general and talented students' perceptions of their career and technical education experiences compared to their traditional high school experiences. *Journal of Advanced Academics*, *18*, 372-405.

Gentry, M., Hu, S., Peters, S., & Rizza, M. (2008). Talented students in an exemplary career and technical education school: A qualitative inquiry. *The Gifted Child Quarterly*, *52*(3), 183-199.

Golden, D. (2003, December 29). Brain drain: Initiative to leave no child behind leaves out gifted, *The Wall Street Journal*. Retrieved from http://online.wsj.com/public/resources/documents/golden6.htm

Gottfredson, G. D., & Johnstun, M. L. (2009). John Holland's contributions: A theory-ridden approach to career assistance. *The Career Development Quarterly*, *58*, 99-107.

Gottfredson, L. S. (1981). Circumscription and compromise: A developmental theory of occupational aspirations. *Journal of Counseling Psychology*, *28,* 545-579.

Grant, D. F., Battle, D. A., & Heggoy, S. J. (2000). The journey through college of seven gifted females: Influences on their career related decisions. *Roeper Review*, *22*, 251-260.

Greene, M. (2006). Helping build lives: Career and life development of gifted and talented students. *Professional School Counseling*, *10*(1), 34-43.

Gresham, P. (2008). *Gifted and talented education in the face of no child left behind.* Unpublished paper written for CIMT 686, Indiana State University, Terre Haute, IN.

Griggs, S. A., & Dunn, R. S. (1991). Counseling gifted children with different learning-style preferences. *Gifted Child Quarterly*, *28*(3), 115-119.

Haensly, P. A., & Lehmann, P. (1996). Nurturing giftedness while minority adolescents juggle change spheres. Paper presented at the 43rd annual convention of the National Association for Gifted Children, Indianapolis, IN.

Hebert, T. P. (2000). Gifted males pursuing careers in elementary education: Factors that influence a belief in self. *Journal for the Education of the Gifted*, *24*(1), 7-45.

Henshon, S. (2010). Giftedness across the lifespan: An interview with Rena Subotnik. *Gifted Child Today*, *33*(1), 27-31.

Holland, J. L. (1994). *The self-directed search.* Odessa, FL, Psychological Assessment Resources.

Holland, J. L. (1997). *Making vocational choices: A theory of vocational personalities and work environments* (3rd ed.). Odessa, FL: Psychological Assessment Resources.

Hollinger, C. L. (1986). Career aspirations as a function of Holland personality type among mathematically talented female adolescents. *Journal for the Education of the Gifted*, *9*, 133-145.

Howe, N. (2005). Harnessing the power of millennials: New education strategies for a confident, achieving youth generation. *School Administrator*, *62*(8), 18-22.

Jolly, J. L. (2005). Pioneering definitions and theoretical positions in the field of gifted education. *Gifted Child Today*, *28*(3), 38-44.

Jolly, J. L. (2009). The national defense education act, current STEM initiative, and the gifted. *Gifted Child Today*, *32*(2), 50-54.

Jolly, J. L., & Kettler, T. (2008). Gifted education research 1994-2003: A disconnect between priorities and practice. *Journal for the Education of the Gifted*, *31*, 427-449.

Lee, S. (2002). The effects of peers on the academic and creative talent development of a gifted adolescent male. *The Journal of Secondary Gifted Education*, *14*(1), 19-29.

Lee, S., Matthews, M. S., & Olszewski-Kubilius, P. (2008). A national picture of talent search and talent search educational programs. *Gifted Child Quarterly, 52*(1), 55-69.

Leung, S. A., & Hou, Z. (2001). Concurrent validity of the 1994 Self-Directed Search for Chinese high school students in Hong Kong. *Journal of Career Assessment*, *9*, 283-296.

Kanevsky, L., & Geake, J. (2004). Inside the zone of proximal development: Validating a multifactor model of learning potential with gifted students and their peers. *Journal of the Education of the Gifted, 28*, 182-217.

Karnes, F. A., & Stephens, K. R. (2002). *Young women of achievement: A resource for girls in science, math, and technology*. Amherst, NJ: Prometheus Books.

Kerr, B., & Erb, C. (1991). Career counseling with academically talented students: Effects of a value-based intervention. *Journal of Counseling Psychology*, *38,* 309-314.

Kerr, B., & Kurpius, S. (2004). Encouraging talented girls in math and science: Effects of a guidance intervention. *High Ability Studies*, *15*(1), 85-102.

Marshall, J., Sears, J., Allen, L., Roberts, P., & Schubert, W. (2007). *Turning points in curriculum: A contemporary American memoir* (2nd ed.). Upper Saddle River, NJ: Merrill Prentice Hall.

McGlynn, A. P. (2005) Teaching millennials: Our newest cultural cohort. *Educational Digest: Essential Readings Condensed for Quick Review, 71*(4), 12-16.

Mendaglio, S. (2006). Affective-cognitive therapy for counseling gifted individuals. In S. Mendaglio & J. Peterson (Eds.) *Models for counseling gifted children, adolescents, and young adults* (pp. 35-36). Waco, TX: Prufrock Press.

MENC: The National Association for Music Education. (2006). Scores of students in the arts. Retrieved from http://www.menc.org/information/advocate/sat/html

Mendez, L. M., & Crawford, K. M. (2002). Gender-role stereotyping and career aspirations: A comparison of gifted early adolescent boys and girls. *The Journal of Secondary Gifted Education*, *8*(3), 96-107.

Mildram, R. M. (1991). *Counseling gifted and talented children: A guide for teachers, counselors, and parents*. Norwood, NJ: Ablex.

National Association for Gifted Children. (2009). *Supporting the needs of high-potential learners.* Retrieved from http://www.nagc.org/index.aspx?id=31

Nelson, M. A., & Smith, S. W. (2001). External factors affecting gifted girls' academic and career achievements. *Intervention in School and Clinic*, *37*(1), 19-22.

Perrone, K., Perrone, P., Ksiazak, T., Wright, S., & Jackson, Z. (2007). Self-perception of gifts and talents among adults in a longitudinal study of academically talented high-school graduates. *Roeper Review*, *29*, 259-265.

Peterson, J. S. (2002). A longitudinal study of post-high school development in gifted individuals at risk for poor educational outcomes. *Journal of Secondary Gifted Education, 14*(1), 6-18.

Peterson, J. S. (2007). Consultation related to giftedness: A school counseling perspective. *Journal of Educational and Psychological Consultation*, *17*(4), 23-296.

Piirto, J. (1999). *Talented children and adults: Their development and education*. Upper Saddle River, NJ: Prentice Hall.

Psychological Assessment Resources. (2004). *Self-directed search.* Odessa, FL: Author.

Psychological Assessment Resources. (2009). *Self-directed search*. Retrieved from http://www.self-directed-search.com/default.aspx

Rachman, D., Amernic, J., & Aranya, N. (1981). A factor-analytic study of the construct validity of Holland's Self-Directed Search Test. *Educational and Psychological Measurement*, *41*, 425-437.

Renzulli, J. S. (1990). A practical system for identifying gifted and talented students. *Early Childhood Development*, *63*, 9-18.

Renzulli, J. S., & Reis, S. (2002). What is schoolwide enrichment? How gifted programs relate to total school improvement. *Gifted Child Today*, *25*(4), 18-25, 64.

Renzulli, J. S., Reis, S., & Sally, M. (1994). Research related to the Schoolwide Enrichment Triad Model. *Gifted Child Quarterly*, *38*(1), 7-20.

Rinn, A., & Plucker, J. (2004). We recruit them, but then what? The emotional and psychological experiences of academically talented undergraduates. *Gifted Child Quarterly*, *48*(1), 54-69.

Roberts, J. L., & Inman, T. F. (2007). *Strategies for differentiating instruction: Best practices in the classroom*. Waco, TX: Prufrock Press.

Robinson, A., Shore, B. M., & Enersen, D. L. (2007). *Best practices in gifted education: An evidence-based guide.* Waco, TX: Prufrock.

Robinson, N. M. (1997). Counseling agendas for gifted young people: A commentary. *Journal of the Education for the Gifted*, *20*(2), 128-137.

Robinson, N. M. (2002). Introduction. In M. Neihart, S. M. Reis, N. M. Robinson, & S. M. Moon (Eds.), *The social and emotional development of gifted children: What do we know?* (pp. xi-xxiv). Waco, TX: Prufrock Press.

Rogers, K. B. (1986). Do the gifted think and learn differently? A review of recent research and its implications for instruction. *Journal for the Education of the Gifted*, *10*(1), 17-39.

Rysiew, K. J., Shore, B. M., & Leeb, R. T. (1999). Mulitpotentiality, giftedness, and career choice: A review. *Journal of Counseling & Development*, *77*, 423-430.

Scott, L. E. (1988). A comparative study of personality, values, and background characteristics of artistically talented, academically talented, and average 11th and 12th grade students. *Studies in Art Education*, *29*(3), 292-301.

Spellings, M. (2007). *Report of the academic competitiveness council*. U.S. Department of Education. Washington, D.C.

Stanley, J. C. (1979). The study and facilitation of talent for mathematics. In A. H. Passow (Ed.) *The gifted and talented: Their education and development. 78th yearbook of the national society for the study of education* (pp. 169-185). Chicago, IL: University of Chicago Press.

Subotnik, R. F., Sone, K. M., & Steiner, C. (2001). Lost generation of elite talent in science. *Journal of Secondary Education*, *13*(1), 33-43.

Swiatek, M. (2007). The talent search model: Past, present, future. *The Gifted Child Quarterly*, *51*, 320-330.

Terman, L.M. (1928). Nature and nurture: Their influence upon intelligence and upon achievement. *Journal of Educational Psychology*, *19*, 362-373.

Terman, L. M., & Oden, M. H. (1959). *The gifted child grows up: Genetic studies of genius.* (Vol. 4). Stanford, CA: Stanford University Press.

Tomlinson, C. (1996). Good teaching for one and all: Does gifted education have an instructional identity. *Journal for the Education of the Gifted*, *20*, 155-174.

Tomlinson, C. (2005). Quality curriculum and instruction for highly able students. *Theory into Practice*, *44*(2), 160-167.

Torrance, E. P. (1980). Growing up creatively gifted: A 22- year longitudinal study. *Creative Child and Adult Quarterly*, *5*, 148-158, 170.

Torrance, E. P., & Safter, H. T. (1999). *Making the creative leap beyond*. Buffalo, NY: Creative Education Foundation.

University Honors Program. (2010). Indiana State University. Retrieved from: http://www.indstate.edu/honors/prospective.htm

U.S. Department of Education. (2007). *Report of the Academic Competitiveness Council: Executive Summary*. Press Release: May, 2007. Retrieved from: http://www.ed.gov/about/inits/ed/competitiveness/acc-mathscience/index.html

U.S. Department of Education. (2008). *Federal Register*. Retrieved from http://www2.ed.gov/legislation/FedRegister/finrule/2008-2/042108c.pdf

U.S. Department of Education. (2009). *Duncan endorses efforts to improve STEM education.* Press Release: November 23, 2009. Retrieved from http://www.ed.gov/news/pressreleases/2009/11/112232009.html

VanTassel-Baska, J. (1998). The role of the family in the success of disadvantaged gifted learners. *Journal for the Education of the Gifted, 13*, 222-226.

VanTassel-Baska, J. & Brown, E. F. (2007). Toward best practice: An analysis of the efficacy of curriculum models in gifted education. *The Gifted Child Quarterly*, *51*, 342-359.

VanTassell-Baska, J. & Little, C. (2003). *Content-based curriculum for high-ability learners*. Washington, DC: Prufrock Press.

Vernick, S. (2002). *The application of Holland's career theory in modern day career services: Integrating the self-directed search and the career thoughts inventory*. (ERIC Document Reproduction Service No. ED465921)

Vigo County School Corporation. (2009). *Gifted and talented*. Retrieved from http://metadot.vigoco.k12.in.us

Weinrach, S. G. (1980). Have hexagon will travel: An interview with John Holland. *The Personal and Guidance Journal, 58*, 406-414.

Wessel, L. (1999). Career counseling for gifted students: Literature review and critique. (ERIC Document Reproduction Service No. ED427267)

Winebrenner, S. (2001). *Teaching gifted kids in the regular classroom*. Minneapolis, MN: Free Spirit.

Winograd, M., & Hais, M. D. (2008). *Millennial makeover*. New Brunswick, NJ: Rutgers University.

Witty, P. A. (1971). *Reading for the gifted and creative student*. Newark, DE: International Reading Association. Yoo, J. E., & Moon, S. M. (2006). Counseling needs of gifted students: An analysis of intake forms at a university-based counseling center. *The Gifted Child Quarterly*, *50*(1), 52-62.

APPENDIX A: SURVEY INSTRUMENTS

The *Self-Directed Search* (4th ed.) was utilized for this research. While not permissible to reproduce, it can be purchased through Psychological Assessment Resources, Inc. Their website is www.parinc.com. An online version of the *Self-Directed Search* is also available. The Occupations Finder, a tool used to help interpret results on the *Self-Directed Search*, is also available through this website.