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Gender Differences in the Vocational Interests of Youth Considering High Job Growth and Green Energy Occupations

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GENDER DIFFERENCES IN THE VOCATIONAL INTERESTS OF YOUTH
CONSIDERING HIGH JOB GROWTH AND GREEN ENERGY OCCUPATIONS

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A Dissertation

Submitted in Partial Fulfillment of the Requirements for the
Doctor of Philosophy in Education Degree

Department of Workforce Education and Development
In the Graduate School
Southern Illinois University Carbondale

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GREEN ENERGY OCCUPATIONS

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Doctor of Philosophy

in the field of Workforce Education and Development

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AN ABSTRACT OF THE DISSERTATION OF

BECKY S. ROBINSON, for the DOCTOR OF PHILOSOPHY degree in EDUCATION with a concentration in WORKFORCE EDUCATION AND DEVELOPMENT, presented on October 18, 2012 at Southern Illinois University Carbondale.

TITLE: GENDER DIFFERENCES IN THE VOCATIONAL INTERESTS OF YOUTH CONSIDERING HIGH JOB GROWTH AND GREEN ENERGY OCCUPATIONS

MAJOR PROFESSORS: Dr. John Washburn and Dr. Barbara Hagler

For more than 100 years, vocational psychologists and educational researchers have sought to identify the significant influences shaping occupational interests. This descriptive study used a series of vocational card sort exercises with 139 rural high school youth to identify gender differences in occupational interests toward working in 60 of the nation's fastest growing occupations, including new and emerging 21st century green energy roles.

Through a classroom-based exercise, youth sorted cards from four decks into piles (1 – 5) at their desk. Sorting the card into pile (1) expressed *Strong Dislike*; pile (2) *Dislike*, pile (3) *No Interest*, pile (4) *Some Interest*, or pile (5) *Strong Interest* toward the occupational information depicted on each card. Four decks of 60 cards were used to measure youth expressed interest toward performing the occupational tasks (A), holding the occupational titles (B), working in the type of workplace environments (C), and using the type of tools and technology (D) used by workers in each occupation. A Total Occupational Interest Score reflected the summation of four scores from deck (A+B+C+D) by each youth toward each occupation. Significant differences in occupational interests were found. Female youth expressed strongest interest toward health care, and lowest interest toward green energy roles. Male youth were most interested in construction, transportation, advanced manufacturing, and homeland security. Both groups most preferred working in traditional roles for each gender to perform in the workplace.

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While completing this doctoral degree program I lost two of the most important people in my life. My father died of emphysema, and my mother died of cancer, both before the age of 70. My dad, Troy Ernest (Ted) Robinson taught me the value of a strong work ethic, often rising to go to work when it was still dark outside, and working his way up the ranks to supervisor overseeing teams of architects with only a high school diploma. My mom, Marilyn Sue Robinson, taught me the importance of truly caring for the needs of others, and the secret to finding happiness in the little things. She graduated with a G.E.D at the same time my brother and I had first completed our college degrees. Though they were not fortunate enough to attend college, my parents taught me and my three brothers the most valuable lessons life holds. I will strive to honor their legacy in the service I provide to others throughout my life and career path.

I owe a debt of gratitude to my friends and family, both near and far, who have encouraged me to push forward and complete this study through life's transitions. Thank you to those who have provided encouragement and support. This accomplishment is shared with many special people and I am sincerely grateful for the kind words and support many have given as I push forward to complete this research study and dissertation paper to achieve this important life goal. This is one example of just how good God is. Thanks and praise be to God above all else.

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CHAPTER I

INTRODUCTION

Industry leaders predict significant consequences to face our nation when emerging industries cannot find enough skilled, trained, and experienced workers to fill job openings in fast growing and emerging occupations. A lack of high skilled workers limits the ability of industry to invest, stimulate economic recovery, and create opportunities for new businesses and jobs to grow. The shortage of skilled workers affects a diverse range of industries nationwide. This study assessed the occupational interests of youth as they considered working in 21st century occupations.

The Nation's Critical Skill Shortage Threatens Our Economic Recover

Industry leaders nationwide are affected by a high skilled workforce pipeline which does not have enough skilled workers to fill occupations in demand and growing. The National Commission on Teaching and America's Future predicted more than one third of the nation's 3.2 million teachers will soon retire, depriving classrooms of experienced instructors and straining taxpayer-financed retirement systems for years to come (Dillon, 2009). Others have warned that...even as the economy slumps and unemployment rises, strong demand for power plants, oil refineries, and export goods will have many manufacturers and construction contractors scrambling to find enough skilled workers to fill current position. (Troinanovski, 2008, p. 1).

Troinanovski identified the importance of reaching out to youth:

with the shortage of welders, pipefitters, and other high demand workers likely to get worse as more reach retirement age, the nation's unions, construction contractors, and businesses are going to have to figure out how to attract young people to these fields (p. 15).

Economic reports have warned for more than a decade that "the national shortage of qualified workers available and interested in filling the nation's skilled occupations remains the biggest

threat to the continued growth and prosperity of the U.S. economy” (Keim, Strauser, & Ketz, 2002, p. 4). Even more unsettling is that fact that many of the high job growth occupations reporting a critical shortage of workers today, are also expected to be among those which continue to grow in demand for even more skilled workers through future years (Quinby & O’Brien, 2004). As paraphrased from the insights of government leaders and economists:

The nation will always need skilled and experienced workers to grow, harvest, and monitor the nation’s food systems; manage clean water systems; monitor community and state waste management and water purification systems; secure and operate transportation systems; and rebuild the nation’s infrastructure. Skilled workers must always be available to respond to natural disasters and emergencies; keep our nation healthy and secure; teach the nation’s children and adults; and serve the public good by filling the roles and filling the responsibilities of local, state, and federal government. (drawn from the words of Barack 2006; Barton, 2006; McKeenan, 1994; and the National Governor’s Association, 2005).

Regrettably, too many indications point to our schools, businesses, communities, and families falling even further behind in their ability to adequately prepare an ample supply of youth to graduate from high school, prepare for college or specialized occupational training, and acquire the type of workplace experiences needed for filling the high skilled workforce pipeline.

The impact of skilled worker shortages threatens many industries, including the emerging green energy industry. Even with government resources aimed at stimulating green energy growth and stimulate new job opportunities, sustainability and success remains dependent on each industry’s ability to access a pipeline of skilled workers who are prepared to enter 21st century occupations. As has been noted by authors White & Walsh (2008) and author Van Jones (2008), the nation’s hope for building a sustainable 21st century green energy economy hinges

squarely on our ability to inspire and recruit millions more workers of both genders and all skill levels to train and work in the green energy occupations expected to grow through future years. Unfortunately, however, these authors identify significant challenges which are predicted to face industry leaders as they seek to find and recruit skilled green energy workers, as reported in the *Greener Pathways* (White & Walsh, 2008), and *Green Collar Jobs* (Jones, 2008).

Industry and government leaders predict serious consequences will impact our nation from the long-term effect of a continuous lack of skilled workers in the skilled workforce pipeline. To address the nation's skilled worker shortage, efforts have been taken by the federal government, the state of Illinois, and the Illinois Board of Higher Education to reverse these troubling trends.

President's High Job Growth Initiative Industry Needs Assessments

Both past and present Presidents of the United States have focused efforts toward addressing the nation's skilled worker shortage. President George W. Bush initiated the *President's High Job Growth Industries Training Initiative* (HJGTI) in 2005 to address the growing skilled worker shortage and identify solutions for helping industries meet growing workforce demands. Through this effort, the U.S. Department of Labor Employment and Training Administration identified those occupational sectors at the national level which met the following criteria:

- (1) were projected to add substantial numbers of new jobs to the economy, or (2) had a significant impact on the economy overall, or (3) would impact the growth of other industries, or (4) were being transformed by technology and innovation requiring new skill sets for workers, or (5) were new and emerging businesses projected to grow.

(USDOL, 2005).

Through the HJGTI, a series of market research studies were conducted to examine the causes of skilled worker shortages, and to brainstorm potential solutions to reverse shortages.

As shared through the following brief highlights, industry leaders face similar challenges.

Automobile Industry Needs Assessment

The review of the automobile industry was conducted by DTI Associates, Inc and reported in the *President's High Growth Job Training Initiative: Automobile Services Sector – Identifying and Addressing Workforce Challenges* (May 2005). The assessment found the automotive services sector was poised to add a substantial number of new jobs for the economy. The report found “the automobile industry was being transformed by technology and innovations which required a 21st century skill set for workers” (DTI, 2005, p. 6). Stakeholders representing the automobile service and retail sectors shared their concerns about the public’s negative perception and lack of awareness about viable jobs in the automobile industry that pay well. They referred to the “problem of old stereotypes and misinformation about the automotive careers...and a mischaracterization of the workplace as being a “grease monkey culture” (DTI, 2005, p. 7). Stakeholders sought effective methods for improving the race, gender, and language diversity of the workforce; and recognized that “the issue of retention was not as critical an issue to their industry, as was the improvement of the flow of the workforce through the pipeline, and the demographic make-up of the industry’s workers” (DTI, 2005, p. 7).

Transportation Industry Needs Assessment

A similar review of the transportation industry was prepared by DTI Associates, Inc. through the report: *Identifying and Addressing Worker Challenges in America's Transportation Industry* (March 2007a). The report identified the transportation industry as growing in numbers of occupations, and included in its assessment “those occupations responsible for the transportation of passengers and cargo, warehousing and storage of goods, scenic and sightseeing transportation, and support activities related to modes of transportation (e.g., air, water, rail, bus,

train, truck)” (DTI, 2007, p. 3). The Bureau of Labor Statistics projected employment increases in the transportation industry of around 12%, growing by more than 1.1 million jobs available to workers per year between 2004 and 2014 (USDOLBLS, 2006, p. 4). The assessment reported the industry was taking steps to develop a pipeline of younger workers to help meet their workforce needs...and was “recruiting workers through untapped labor pools of dislocated workers, transitioning military personnel, veterans, and individuals with disabilities” (USDOLBLS, 2006, p. 5).

Advanced Manufacturing Needs Assessment

A review of the advanced manufacturing industry was conducted by the U.S. Department of Labor and reported in *Advanced Manufacturing Industry – Addressing the Workforce Challenges of America’s Advanced Manufacturing Workforce* (January 2005). The assessment found the advanced manufacturing industry undergoing a dramatic transformation. The assessment recognized that “modern manufacturing facilities today barely resemble the traditional factory of decades past” (USDOLETA, 2005a, p. iii). The study found that “popular perceptions of manufacturing jobs as dark, dangerous, and dirty are largely outdated, as advanced robotics and other intelligent systems become pervasive throughout manufacturing” (USDOLETA, 2005a, p. iii). The industry must also confront a negative public image characterized by “moving offshore”, “declining”, “dirty”, “low pay”, etc. (USDOLETA, 2005a, p. iv.). The workforce challenges identified by stakeholders involved with the study included the need to enhance the flow of new workers into the pipeline. Leaders recognized that “too few young people were considering the possibility of a manufacturing career; and too many are unaware of the necessary skills needed by workers in the advanced manufacturing industry” (USDOLETA, 2005a, p. iv).

A similar study conducted by the National Association of Manufacturers in 2005 found that 90% of the manufacturing supervisors reported a moderate to severe shortage of qualified skilled production employees, such as machinists and welders. The findings warned that within the next five to seven years, more than 20% of the most experienced skilled trades workers in these organizations would retire from the workforce (White & Walsh, 2008).

Biotechnology Industry Needs Assessment

A review of the biotechnology industry was prepared by New Economy Strategies, Inc. and the Leonard Resources Group for the U.S. Department of Labor Employment and Training Administration, Business Relations Group (2004). The study's report, *The Biotechnology Industry – Identifying and Addressing the Workforce Challenges in an Emerging Industry* found:

While many people associate the biotechnology industry with the widely publicized discovery and development of new drugs to treat cancer, heart disease, and other diseases; fewer people are aware of the major advancements the industry is making in areas such as chemicals, agriculture, pharmaceuticals, medical devices and equipment, nanotechnology, information technology, and facilities and infrastructure management (New Economy Strategies, et al, 2004, p. 6).

It was reported that the biotechnology industry broadly struggles with recruitment. The assessment found of particular concern was the “lack of new youth and career changers entering the industry, which is resulting in a limited pipeline of new workers” (New Economy Strategies et al, 2004; p. 24). A challenge to the biotechnology industry is finding an adequate supply of workers who possess an adequate skill set to meet industry requirements. Additional challenges include a disproportionate number of applicants which lack adequate math and science preparation at the secondary and post-secondary level. The assessment found there “is perceived

to be a general shortage of people who have the specialty skills needed for working in a science-based industry” (New Economy Strategies et al, 2004, p. 25).

Recruitment efforts to the biotechnology industry are also “related to the challenge of reversing the negative image of the industry and misperceptions about its occupations and skill requirements...including misperceptions that only doctoral level scientists work within the industry” (New Economy Strategies et al, 2004, p. 25).

Geospatial Technology Industry Needs Assessment

A comparable review of the geospatial technology industry was conducted by the U.S. Department of Labor in November 2, 2005, as reported in *Identifying and Addressing Workforce Challenges in America’s Geospatial Technology Sector*. The report predicted that geospatial projects and specialists will continue to play a large role in homeland security activities, and that information gathering needs will result in an enormous increase in demand for workers with geospatial technology skills (USDOL ET Ab, 2005). Data provided by the U.S. Department of Labor Bureau of Labor Statistics indicated that architecture and engineering occupations, including cartographers, and photogrammetric technicians represent geospatial occupations were positioned for high job growth potential (USDOL ET Ab, 2005). However, studies by the *American Society of Photogrammetry and Remote Sensing (ASPRS) Ten Year Industry Forecast* (Mondello, Hepner, & Williamson, 2004), warned there are insufficient numbers of graduates with training in the technologies who are ready to enter the workforce. The report shared “that 87% of geospatial product and service providers stated they had difficulty filling positions requiring geospatial technology skills” (Mondello et al, 2004, p. 1). The “most difficult positions to fill with qualified applicants are application developer, cartographer, software developer, cartographic technician, GIS applications analyst, and GIS technician” (Mondello et al, 2004, p.

6). The industry assessment included forums with executive to discuss the emerging nature of technologies, but a general lack of understanding by the public of what is meant by geospatial technologies....and the “industry faces an image problem with youth” (USDOLETA, 2005, p. 3).

A concern was shared that “youth view geospatial technology careers as less compelling and exciting than other information technology careers, thus creating a challenge in developing youth interest in this field” (USDOLETA, 2005, p. 3).

Information Technology Industry Needs Assessment

A review of the information technology industry was conducted by the U.S. Department of Labor Employment and Training Administration, and results were reported in *Information Technology: Identifying and Addressing Workforce Challenges in the Information Technology Industry* (USDOLETA, 2004a). Based on meetings with executives representing 18 energy companies, the assessment findings projected computer systems design and related service industries to be some of largest and fastest growing occupations within the information technology industry. Projections are the United States will need over 1.3 million new information technology workers to fill newly created positions and to replace older workers leaving the field in the coming decade (USDOLETA, 2004a).

Construction Industry Needs Assessment

A review of the construction industry was conducted by the U.S. Department of Labor Employment and Training Administration with results reported in *America's Construction Industry: Identifying and Addressing Workforce Challenges* (USDOLETA, 2004b). The study found industry leaders warning that the construction industry is facing a shortage of workers, and is having “difficulty recruiting individuals from the two general demographic groups deemed

critical to filling the high skilled workforce pipeline: youth and non-traditional labor pools (e.g. women)” (USDOLETA, 2004b, p. v). The report found recruitment was “made more difficult due to a lack of awareness of job opportunities in the construction industry, and a poor industry image” (USDOLETA, 2004b, p. v.). Stakeholders reported that “youth are not aware of the skills required by occupations in the industry; and jobs in the industry are seen as dangerous” (USDOLETA, 2004b, p. 1).

Financial Services Industry Needs Assessment

A review of the financial services industry was prepared by DTI Associates, Inc. for the U.S. Department of Labor in March 2007. The report: *Identifying and Addressing Workforce Challenges in America’s Financial Services Industry* found the financial services industry is also hampered by the lack of interested workers in the pipeline, often due to misperceptions about career opportunities.

Hospitality Industry Needs Assessment

A similar review of the hospitality industry prepared by DTI Associates, Inc. (March 2006) reported in *Hospitality Industry: Identifying and Addressing Workforce Challenges* found that the “industry faces a current shortage of essential workers, and an insufficient pipeline of new workers in sufficient quantity to satisfy demands” (DTI, 2006, p. v). Results were based on findings gathered from discussions with industry leaders regarding key workforce challenges facing the hospitality industry. Among the most serious concerns were the perceptions of “negative images impacting employment in the hospitality industry, including the perception of low wage, dead end jobs” (DTI, 2006, p. iv).

Retail Trade Industry Needs Assessment

A review of the retail trade industry was conducted by the U.S. Department of Labor Employment and Training Administration (January 2003). Forums were held with executives from retail companies, as well as representatives of the National Retail Federation and the National Association of Chain Restaurants. The report, *Identifying and Addressing the Workforce Challenges in America's Retail Trade Industry: Executive Summary* stated “the retail trade sector is the nation’s largest employer, with 15 million jobs in 2004, and expectations of adding 1.6 million new jobs per year” (USDOLETA, 2003, p. 1). The study found the retail services industry struggling to attract and retain the “best and the brightest employees, often due to the misperception that retail industry jobs are low-wage and lack growth potential” (USDOLETA, 2003, p. 2).

Health Care Industry Needs Assessment

A comprehensive review of the health care industry was prepared by Alexander, Wegner & Associates for the U.S. Department of Labor Employment and Training Administration (February 2004) and reported in the *Health Care Industry: Identifying and Addressing Workforce Challenges*. The report found that the “majority of the workforce challenges reported across primary care, long-term care, and acute care services...share a common problem in filling occupational vacancies posted for registered nurses” (Alexander et al, 2004, p. 14). Similar results from surveys conducted by the American Hospital Association reported growing numbers of health care leaders who continue to rank the issue of workforce recruitment and retention among the most critical concerns facing the nation’s health systems (A.A.C.N., 2009; A.H.A., 2007; Daffon & Hart, 2001). More than 70% of hospital administrators surveyed by the AHA reported a shortage of qualified candidates to fill a wide variety of critical service roles

(Brookhaven, 2004). The National Academy of Sciences warned in 2008 that the health care system is not ready to care for a population of aging baby boomers. The American College of Emergency Physicians gave the nation a D-grade for access to emergency care, stating the “shortage of nurses, primary care physicians, emergency physicians and other specialists, available, trained, and experienced in the skills needed to fill these critical service industries are among the critical factors contributing to the health care crisis” (Johnson and Potts, 2008, p. 4).

Health care administrators and providers have warned for years a critical skill shortage crunch was coming. The US Department of Health and Human Services predicted “the health care industry is projected to face a registered nursing shortage of half a million nurses nationwide by year 2025” (Johnson, 2008, paragraph 3). Today’s shortage of skilled workers entering the health care industry is made even more critical due to the fact that 9 of the top 20 occupations predicted for the highest overall job growth through future years will be found in the health care industry (USDOLBLS, 2006).

Both providers and patients are affected by a shortage of skilled workers. According to the American Academy of Family Physicians, “if critical skilled workforce shortage trends continue, the nation will be short about 125,000 family care doctors by 2020” (MSNBC, 2009). The Joint Commission on Accreditation of Hospital Organizations (JCAHO) has calculated that “the shortage of nurses (and doctors) is contributing to a quarter of the nearly 100,000 preventable hospital deaths each year” (MSNBC, 2008, paragraph 2). The aging of the workforce is also a significant issue, as the industry recognizes “there are many attractive career alternatives for young people other than health care...and the public’s image of the health care field is less positive than it was a decade ago” (Alexander et al, 2004, p. 15).

Energy Services Industry Needs Assessment

A review of the energy Services industry was prepared by DTI Associates, Inc., for the U.S. Department of Labor Employment and Training Administration (DTI, 2007b). The report, *Identifying and Addressing Workforce Challenges in America's Energy Industry*, was based on results of a series of six executive forums with energy industry executives in 2005. Energy industry sectors involved included representatives of the oil and gas industry, electric and natural gas utilities, nuclear energy, and mining.

Results of these forums found executives stating that “there is clearly a demand for new workers, workers recruited from new sources, trained in new skill sets, along with training for incumbent workers to upgrade their skills” (DTI, 2007b, p. iv.). Executives recognized there is a “negative public image that is challenging the energy industry’s recruitment efforts” (DTI, 2007b, p. 1). The executives recognized that “the workforce is aging and the imminent retirement of a large segment of incumbent workers” from the energy services industry is clearly on the horizon (DTI, 2007b, p. v). At the same time, the energy industry is expected to expand to include green and renewable energy providers, which in turn is expected to provide millions more workplace opportunities for workers of all skill levels.

Green Energy Industry Needs Assessment

President Obama spearheaded federal government efforts to pass the *American Recovery and Reinvestment Act of 2009* (White House, 2009a) with a goal of investing more than one trillion dollars of federal treasury to spur economic recovery and create millions of sustainable jobs. The *White House Agenda for Energy and the Environment* (Obama, 2009) set goals of expanding a green energy economy to create or save 3.5 million jobs from 2009 through 2011 through initiatives designed to help the environment and build the nation’s renewable energy capacities.

Attempts continue to target investing resources in alternative and renewable energy resources with the goals of creating millions of green energy jobs, as detailed on the White House website (Obama, 2009).

Shortly after passage of the American Recovery and Reinvestment Act, the U.S. Department of Labor Employment and Training Administration embarked on a review of state and local workforce systems partners to determine how ready the system was to implement the *Recovery Act*, along with the Workforce Investment Act (WIA), and other workforce development programs. *The National Workforce Systems Readiness Level and Technical Assistance Needs for Implementation of the American Recovery and Reinvestment Act* (2009) found that the most common areas of technical assistance needed by WIA providers included workforce information on high demand industries and tools for helping individuals build careers in green energy jobs.

The USDOL Employment and Training Administration lead the *Green Jobs Initiative* (2009) to support the development of apprenticeships and job training programs to meet the growing demand for green construction professionals skilled in energy efficiency and renewable energy installation, with a goal of introducing both male and female youth to experience and consider green energy occupations. The American Solar Energy Society (ASES) has stated the renewable energies and efficiencies industry sector today represents more than 9 million jobs and \$1.045 billion in U.S. revenue, and has been growing at a rate three times the U.S. economy (*Green Collar Jobs*, 2009). A variety of green job forecasters have predicted successful transformation from a fossil-fuel based economy to a green-energy driven economy will produce millions of work opportunities harnessing and sharing wind, solar, and alternative energy systems and resources (Zappala, 2009; O'Connor & Pasciucco, 2008; Blue Green Alliance, 2009).

A 14-page report prepared by President Obama's Council of Economic Advisers provided an industry-by-industry breakdown of the type of jobs forecasted for green energy growth. The report predicted that "about 500,000 jobs would be created by making new investments in clean energy, doubling the production of alternative energy over three years, and improving the energy efficiency of government buildings and homes" (Zeleny & Herszenhorn, 2009, paragraph 8). The hope is that a sustainable green jobs economy will produce the spark needed for increasing employment opportunities in a variety of green energy occupations nationwide.

Participants of the U.S. Conference of Mayors in 2008 found the "macro- benefits of a green energy economy brought positive opportunities for increased investment in new technologies, greater productivity, improvements in the U.S. balance of trade, and increased real disposable income" (U.S. Conference of Mayors, 2008, p. 17). The mayors believed a "green jobs economy could bring real advantages in job growth, income growth, all while producing a cleaner environment" (U.S. Conference of Mayors, 2008; p. 17). The Mayor's report concluded "the potential growth in green jobs is significant in that it could be the fastest growing segment of the U.S. economy over the next several decades, and could dramatically increase its share of total employment" (U.S. Conference of Mayors, 2008, p. 18).

The green jobs economy could be a key for the nation's economic recovery if a sufficient pipeline of skilled workers is available for service in these emerging occupational titles. Researchers Pollin and Wicks-Lim reported in 2008 on the potential for employing millions of workers in a growing green energy economy in the *Job Opportunities for the Green Economy: A State-By-State Picture of Occupations That Gain From Green Investment*. The report was produced through the Political Economy Research Institute at the University of Massachusetts, Amherst. The study found that workers who possess "blue-collar" skills from as many as 45

different occupations and trades will be in increased demand in a green energy economy for their unique skills and experiences. The authors also cited the fact that most of the “blue-collar” occupations expected to grow are already large in size today; employing 14 million people, or 9% of the total workforce (Pollin & Wicks-Lim, 2008, p. 6). The problem remains the green energy industry’s ability today to successfully recruit, train, and retain a body of skilled workers who are interested and available to fill the fast growing occupations predicted to be in high demand for skilled workers through future years. Each industry faces similar the challenges accessing an essential pipeline of skilled workers ready to fill roles in the 21st century workplace.

The State of Illinois Seeks To Reverse Skilled Worker Shortage

The shortage of skilled workers is being felt by industries across the state of Illinois. As reported by the Hudson Institute in 2004, as part of the *State of Illinois Critical Skills Shortage Initiative*, the “recruitment and retention of skilled workers to the health care pipeline as the most critical workforce challenge facing the State of Illinois” (Hudson Institute, 2004, p. 3). Study findings shared in *The Critical Skill Shortages Report on the Healthcare Sector for the Northeast Illinois Economic Development Region* found “hospital administrators across the state reported shortages in nearly every type of hospital occupation” (Hudson Institute, 2004, p. 5).

Recommendations based on the report findings directed the State of Illinois Department of Labor to continually monitor gaps in critical occupation employment, and to employ effective means and flexible tools for recruiting a diverse, non-traditional pool of workers into those occupations desperate for skilled workers across high job growth industries.

The Illinois Board of Higher Education Supports Workforce Readiness Strategies

The Illinois Board of Higher Education adopted a *Public Agenda for College and Career Success* in 2009 which is directed at enhancing the readiness of Illinois youth for the 21st century

workplace. The *Agenda* “provides a planning blueprint for the state of Illinois to direct state policies and resources to the higher education and career needs of Illinois residents, and to address the current and future economic needs of the state” (IBHE, 2009, p.1).

The vision of the *Public Agenda* includes:

having a “well-educated workforce with the skills and competencies to compete in the modern economy”...and “increasing the number of people with quality postsecondary credentials, with particular emphasis on fields in critical skill shortages, such as nursing, allied health professions, and information technology” (IBHE, 2009, p.3).

A recommendation to achieve this goal includes:

capitalizing on emerging areas of the economy, such as workforce development opportunities in biofuels, biopharmaceuticals, clean coal technology, and wind energy production...and for training individuals to fill the type of jobs available for workers at all skills levels, from technician to scientist (IBHE, 2009, p. 33).

Federal, state, and industry leaders seek solutions to reverse the nation’s skilled worker shortage.

Problem Statement

Warnings have been delivered from the federal government, the state of Illinois, and industry leaders that the nation’s skilled workforce pipeline is not producing the quantity and diversity of workers needed to fill the nation’s fastest growing occupations. Even the promise for new industry growth offered through a 21st century green energy economy remains dependent on the ability to recruit enough skilled workers to fill job openings. The growth and diversification of the skilled workforce pipeline requires an infusion of new workers. The problem remains, however, that high job growth industries today are already facing significant challenges recruiting and retaining enough male and female skilled workers to meet growing demands.

Experts predict that “without a workforce pipeline available to fill the growing number of skill-based occupations available, the green energy opportunity will remain wasted and unfilled” (Pollin & Wicks-Lim, 2008, p. 6).

As written by author J. I. Zappala in 2009:

the National Renewable Energy Lab has warned that the major barriers to a more rapid adoption of renewable energy and energy efficiency are not financial, legal, technical, or ideological in nature....the biggest problem is simply that green employers can't find enough skilled workers to do the jobs that are needed today to meet demand (p. 13).

Research is needed to assess the status of occupational interests of high school youth as they consider working in the nation's fastest growing occupations facing skilled worker shortages.

Research is warranted to examine the degree to which gender limits or restricts the expressed occupational interests of youth as they consider working in a variety of traditional and non-traditional occupations dependent on accessing a pipeline of skilled workers in future years.

Insight is needed on the occupational interests of youth as they consider working in the nation's high job growth occupations projected to face shortage of skilled workers through future years.

Purpose of the Study

The purpose of this study was to measure the degree of interest male and female youth expressed towards working in 60 of the nation's fastest growing occupations, many of which are also facing critical shortage of skilled workers today. The study examined whether significant gender-based differences were found in the degree of interest expressed by youth towards performing the type of occupational tasks, working in the type of workplace environments, holding the type of occupational titles, or using the type of tools and technologies which are commonly required of workers in 60 fast growing occupations in emerging industries.

Research Questions

1. What were the expressed occupational interests of youth towards working in each of the 60 high job growth occupations examined in the study?
2. To what degree were there significant differences in the degree of occupational interest expressed by male and female youth towards working in each occupation?
3. To what degree does the proportion of male and female youth expressing interest in working in non-traditional occupations for their gender to perform significantly differ?

Significance of the Problem

Reversing the nation's critical skilled workforce shortage relies on the ability of industries, government, schools, and families to work together to enhance the occupational interests and readiness of youth for succeeding in the 21st century workplace. Reports indicating youth are not being prepared with adequate 21st century skills, knowledge, and work-based experiences required for employment are particularly troublesome as our nation struggles to reverse our critical skill worker shortages (AFL-CIO, 2004; Green, 2001; McKeenan, 1994; McGrath, 2005).

Assessing Youth Readiness for the 21st Century Workplace

Many indicators point to a weakening of readiness factors for today's youth as they prepare to fill the nation's high job growth occupations and industries. Our nation's ability to build a 21st century workforce prepared and available to fill the high skilled workforce pipeline depends on our youth gaining the education, workplace, and life experiences that can engage youth in exploring and considering a wide range of occupations facing shortages of workers.

College readiness indicators continue to drop. Reports indicate weakened levels of post-secondary readiness in classrooms today, including weak performances in standardized test scores evaluating math, science, and reading comprehension skills (Zagier, 2008). The College

Board reported in 2008 that SAT scores for high school students ranked at an all-time low for the second straight year; and average ACT scores shown a slight decrease over prior years (as reported by MSNBC, 2008). A report by the National Governors Association in 2005 found 60% of high school seniors rated their school as “fair” or “poor” in teaching them the skills they needed to obtain a job; half of the students in the study reported they felt they lacked the practical skills necessary to prepare for college or for work” (National Governor’s Association, 2005, p. 10).

High school drop-out rates continue to climb. A report commissioned by the Bill and Melinda Gates Foundation, *The Silent Epidemic: Perspectives of High School Dropouts* (Bridgeland, Dilulio, & Morison, 2006), found nearly 50% of the 470 high school dropouts surveyed for the study reported they left school because their classes were boring and were not perceived as being relevant to their lives or career aspirations. The reports emphasized there was “no single reason why students dropped out, but many fell behind in elementary and middle school and could not make up necessary ground...with many abandoning high school with less than two years to complete their diploma” (Bridgeland, et al, 2006; p. 2).

Too many schools are failing in their role of educating and inspiring youth to complete their education. Some have claimed there is a high school dropout epidemic sweeping the nation (Bridgeland, Dilulio, Balfanz, 2004; Bridgeland, Dilulio, Morison; 2006). According to Swanson (2008), “whereas the conventional wisdom has long placed the high school graduation rate around 85 percent, a growing consensus has emerged that only 7 in 10 students are actually successfully completing high school” (Swanson, 2008, p. 1). “Nearly one half of all blacks, Hispanics, and Native Americans – fail to graduate from public high schools with their class” (Swanson, 2008, p. 2). Often, despite having career aspirations which required education beyond

high school, and having grades of C or better to pass, it was found that circumstances in the students' lives, and an inadequate response to those circumstances from the schools or family, often lead to high drop-out rates (Bridgeland, et. al., 2006; p. 5).

Research has shown the impulsive decision to dropout is a dangerous one for any student to make. Dropouts are more likely than their peers who graduate to be unemployed, living in poverty, receiving public assistance, in prison, on death row, unhealthy, divorced, and single parents with children who drop out of high school (Bridgeland et al, 2006; Porfeli, Hartung, & Vandracek, 2008). Tragically, while some students drop out because of significant academic challenges, most dropouts are students who believed they could have succeeded in school (Barrack, 2006, p. 20). Without a high school education, youth are less likely to be prepared for the high job growth occupations dependent on skilled workers in the 21st century workplace

Too few youth are gaining workplace experiences. Although it is recognized that workplace experiences provide youth with important opportunities to work with others, make decisions, take initiative, and build the critical 21st century skill set needed for employment, too few youth today are provided with entry-level job opportunities essential for career exploration and development. Goodman reported on data from the US Department of Labor and assessed that “from year 2001 to 2007, while the number of Americans employed outside the military grew by more than 8.3 million, employment among teenagers fell by more than 1.2 million” (Goodman, 2008, paragraph 19).

As reported by Bob Hebert in the New York Times (February 28, 2009), the nation's youth are bearing the brunt of the downturn in the nation's recession and the subsequent loss of entry-level job opportunities available in communities nationwide:

The current economic downturn which has cost millions of American workers their jobs may be hurting the young workers seeking employment opportunities and training the hardest. Nearly 2.2 million young people age 16 through 29 have already lost their jobs in this recession; and this trend follows a steep decline in employment opportunities for young workers over the past several years (Herbert, 2009, paragraph 11).

Author Peter S. Goodman painted a bleak portrayal of the significant problems resulting from the nation's systemic underemployment of youth as paraphrased from Goodman's editorial:

As the forces of economic downtown ripple widely across the United States, the job market of 2008 is shaping up as the weakest in more than half a century for teenagers looking for summer work, according to labor economists, government data and companies that hire young people...This deterioration is jeopardizing what many experts consider a crucial beginning stage of working life, one that gives young people experience and confidence, along with pocket money...Little more than one-third of the 16 – to 19-year olds in the United States are likely to be employed this summer, the smallest share since the government began tracking teenage work in 1948....That is a sharp drop from the 45 percent level of teenage employment reached in 2000 (Goodman, 2008, p. 1).

According to a series of studies used to forecast the teen job market by Northeastern University, economist Andrew Sum and his team found the percentage of teens employed had fallen from nearly 45% in 2000 to 30% in 2008 (Sum, McLaughlin,& Khatiwada, 2008). Teenage employment in 2008 hit a record 60 year low for the nation's teens, and continues to drop due to limiting entry level job opportunities for youth nationwide (Goodman, 2008). Employment rates in low-income minority areas often do not hover above 10% (Sum, et al,

2008). Trend data indicates the loss of teen job growth is reported to be 10 times the decrease for adult workers, who are increasingly taking jobs that once went to teenagers (Sum et al, 2008)

At a time when the nation desperately needs a steady flow of skilled workers to fill the workforce pipeline, all indications are that fewer youth today are being provided with the type of workplace experiences and training needed for expanding occupational interests. Paul Barton predicted in his article, *The Dropout Problem: Losing Ground* that the situation of rising high school drop-out rates, coupled with rising levels of unemployment of youth, will lead the nation to perilous times. Barton's research found that "in 2003, 1.1 million 16 – to 19-year-olds did not have a high school diploma and were not enrolled in school" (Barton, 2006, p. 17). "Only 4 of 10 of the 16 to 19-year-olds were employed; as were fewer than 6 in 10 of the 20 to 24-year-old dropouts" (Barton, 2006, p. 18). Fewer hands-on work experiences mean fewer youth are being trained to perform the type of occupational skills critically important to filling America's high job growth occupations. Without workplace experiences, lost are opportunities to test and enhance skills needed for success in the 21st century workplace (Center for Labor Studies, 2009).

Gender restricts occupational experiences and interests. Youth each day are forming opinions and associations about the type of occupations they would like to do, and whether or not that type of work would be considered to be an acceptable role for them to perform in the workplace. Youth are also assessing whether or not the occupation is likely to be accessible to them if they do try to attain it. As stated by Gottfredson, "youth will likely dismiss those occupations deemed to be unacceptable for them (or their gender), or likely un-accessible to them in future years" (Gottfredson, 1981, p. 162). A number of career development theorists have determined that occupational interests and vocational identities are significantly influenced and compromised due to a wide number of factors; including one's gender, socioeconomic

status, ethnicity, physical abilities, and geographic location (Lent, Brown, Hackett. 1994; Gottfredson, 2005; Hackett & Betz, 1981; Hackett & Byars, 1996; Hannah & Kahn, 1989; Wahl, 2000; Wilson & Wilson, 1992).

Above all other factors, researchers have found an individual's gender to be one of the most powerful and persistent influences on occupational behavior and career aspirations during adolescence (Betz, 1993; Eccles, 1994; Osipow, 1973; Wooten, 1991; Betz & Fitzgerald, 1987; Davey & Stoppard, 1993; Fitzgerald, Fessinger & Betz, 1995; Rojewski & Hill, 1998; Luzzo & Hutcheson, 1996;). When trying to assess the consequences of a limited gender-based occupational view, researchers have found that sex-role stereotyping of children's occupational preferences, and sex-typed occupational stereotypes formed by children were all too often serving as their guides for expressed occupational choice (Archer, 1989; Francis, 1996; Greene, Sullivan, Beyard, 1992; McCracken & Odell, 1998). Studies of gender and occupational aspirations by Looft (1971a, 1971b) revealed that as early as the first or second grade girls expressed more restricted occupational aspirations than boys. These studies suggested that girls identified a narrower range of occupational preferences and had lower expectations of occupational attainment than did boys (Bogie, 1976; McNulty & Borgen, 1988; Wahl & Blackhurst, 2000). A year 2000 high school poll showed "52% of high school boys think they would enjoy being scientists, in contrast to only 20% of high school girls" (NSF, 2000; p. 8). Among high school students identified as mathematically gifted, female students were less likely than male counterparts to choose a math or sciences major in college (40% to 72%), or to pursue a math or science career goal (24% to 56%) (Dawes, Horan & Hackett, 2000).

The U.S. Department of Labor Bureau of Labor Statistics *Occupational Outlook* (2003 – 2004 & 2004 – 2005) reported women were seriously underrepresented in scientific and

technical careers, as well as in high job growth technology positions in business, government, education, and the military. However, studies by the American Association of University Women in 2000 support research by Cronin, Cooper and Roger (1997& 1999) which found women were opting for traditionally female careers, but a few more female appear to be venturing toward traditional male employment in science, technology, and engineering (S.T.E.M.) occupations.

As reported by author Betz in Brown & Lentz (Eds.) *Career Development Counseling: Putting Theory and Research to Work* (2005), “Even though high technology is among the fastest growing and well-paid occupational fields, women represent only about 10% of engineers, 30% of computer systems analysts, and 25% of computer programmers” (Betz, 2005; p. 255). “Women are employed as only 8% of physicists and astronomers. 7% of air traffic controllers, 5% of truck drivers, 4% of pilots, and 3% of firefighters; and men are nine times as likely as women to be employed in protective services” (Betz, 2005; p. 256).

An assessment of occupational interests of male and female youth toward the 21st century workplace will benefit government leaders, industry leaders, educators, families and youth who seek to reverse the nation’s critical skill workforce shortage and prepare to perform critical occupations of importance to our nation’s health, sustainability, and economic recovery.

The ability of current and emerging industries to access a flow of skilled and experienced workers with the 21st century skill set needed to fill critically important occupations nationwide is dependent on the recruitment and engagement of male and female youth who will find congruence with the type of occupations which are seeking skilled workers through future years.

Limitations and Delimitations

Limitations

The researcher recognizes several limitations which created conditions outside of the investigator's control that affected data collection. Limitations of the study include:

1. The investigator recruited 24 high schools to participate, and 5 of the 24 schools self-selected to serve as host sites for this study, outside of the control of the investigator.
2. The principal of each host sites selected the teachers and classrooms of youth to participate in the study, outside of the control of the investigator.
3. The host teachers set the time period for when the classroom-based study was conducted.
4. The investigator had no control over the final sample size of youth participants, each youth's reading ability, or age of youth who participated in the study.

Delimitations

The investigator acknowledges there were boundaries purposely placed on the study to narrow its' focus to aide in data collection and analysis procedures, including:

1. The investigator limited the number of occupations examined in the study to 60 roles, whereas there are more than 15,000 occupational titles which could have been examined.
2. There are many variables which affect career decision making, and the investigator purposely limited analysis only to the effect of gender on occupational interest scores.
3. The investigator acknowledges that the pool of 24 high schools recruited for involvement in the study are predominantly located in rural communities, limiting the ability of the study to include youth in communities located in closer proximity to an urban area.

Definitions of Terms

Green Energy Occupation

The U.S. Department of Labor has identified 12 distinct sectors of a green energy economy which have occupational implications: (1) renewable energy generation; (2) transportation; (3) energy efficiency; (4) green construction; (5) energy trading; (6) energy & carbon capture and storage; (7) research design and consulting services; (8) environmental protection; (9) agriculture and forestry; (10) manufacturing; (11) recycling and waste reduction; and (12) governmental and regulatory administration occupations.

High Job Growth Industries

The U. S. Department of Labor identifies high job growth industries as those (1) projected to add substantial new jobs to the economy, or affect the growth of other industries; or (2) are existing or emerging businesses being transformed by technology and innovation requiring new skills.

Occupation

An occupation is defined by the U.S. Department of Labor as a group of jobs, found at more than one establishment, in which a common set of tasks are performed, or are related in terms of similar objectives, methodologies, materials, products, worker actions, or worker characteristics.

Sex-Typed Occupation

The U.S. Department of Labor classifies those occupations which have 75% or more of workers being predominantly male or female as sex-typed occupations.

CHAPTER 2

LITERATURE REVIEW

The purpose of this study was to measure the degree of interest expressed by male and female youth towards working in 60 of the nation's fastest growing occupations, many of which are predicted to face a critical shortage of skilled workers through future years. Data was collected to capture the degree of interest expressed by using a vocational card sort exercise towards performing the type of occupational tasks, holding the occupational titles, using the type of tools and technologies, and working in the type of workplace environments which are commonly required of workers in each of the 60 occupations examined in the study.

More specifically, data was collected to measure whether significant differences were found in the expressed occupational interests of male and female youth towards working in the mix of traditional, non-traditional, and gender neutral occupations examined through this study.

Career Development Theory Guided Research Design

For more than one hundred years, researchers and scholars have attempted to understand the significant influences shaping the career development process. Author Richard S. Sharf summarized: "career development theory attempts to explain behavior that occurs over many years; and is made up of reactions to thousands of situations and experiences in school, during hobbies, and with parents and peers" (Sharf, 2006, p.3). Consistently research has pointed to a variety of significant factors, experiences, and influences which contribute to the vocational decision-making process of youth.

Frank Parson's Early Influence on Career Development Theory

Editors Steven Duane Brown and Robert Lent provided an excellent review of career development history in their comprehensive text, *Career Development and Counseling: Putting*

Theory and Research to Work (2005). The authors provided details of prominent career development theories across each decade, and recognized the central influence for the premise of many modern career development theories were most often generated from the early work of Frank Parsons. The authors noted “Parson’s tripartite model – understanding one’s self, understanding requirements of the jobs available, and choosing one based on true logic – underpinned the career development practice into the middle of the twentieth century” (Brown & Lent, 2005, p. 28).

Frank Parsons’ early work, *On Choosing a Vocation* (1909), cemented his legacy as leader and founder of vocational guidance. His published model provided key insight on the fundamental procedural steps of career counseling, and the importance of assessing an individual’s interests, abilities, and work history for occupational matches. According to Sharf, Parsons stated the following about career counseling strategies for helping an individual find successful occupational matches:

To select an occupation, an individual should have (a) a clear understanding of him or herself—attitudes, abilities, interests, ambitions, resource limitations, and their causes; (b) a knowledge of the requirements and conditions of success, advantages and disadvantages, compensation, opportunities, and prospects in different lines of work; and (c) true reasoning on the relations of these two groups of factors (Sharf, 2006, p. 25).

Parsons acknowledged the importance of vocational development experiences and increasing exposure to the world of work during the childhood period (Porfeli, Hartung, & Vondracek, 2008). “Ever since Parson’s early work, career counselors have relied on interest assessments to record a client’s career-based intentions and motivations, and to help provide guidance during career exploration” (Brown, 2007, p. 138).

Evolution of Career Development Theory Research

Building on Parson's call for using career counseling guidance assessments, the Strong Vocational Interest Bank for Men (SVIB) was developed by E. K. Strong and published in 1927. As was noted by Duane Brown in his text *Career Information, Career Counseling, and Career Development* (2007), early activity of prominent researchers and vocational psychologists resulted in eight theories of career choice and development published from 1950 to 1970 (p. 7). In summary, Eli Ginzberg and associates published *Occupational Choice: An Approach to a General Theory*, which outlined a developmental theory of career development in 1951. Donald Super published *A Theory of Vocational Development* in the *American Psychologist* in 1953. Ann Roe published *The Psychology of Occupation* in 1956), which contained her personality-based theory of career development. John Holland published *The Theory of Vocational Choice* in the *Journal of Counseling Psychology* in 1959. Dawis, Lofquist and Weiss broke new ground with the *Adjustment to Work* premise for a trait-factor model of occupational selection and work adjustment theory in 1969. John Krumboltz published the *Social Learning Theory* in 1970. Albert Bandura's published the *Social Cognitive Theory* in 1971. Linda Gottfredson's published the *Theory of Circumscription and Compromise: A Development Theory of Occupational Aspirations* in 1981. Robert Lent, Steven Brown, and J.D. Hackett's published the *Social Cognitive Career Theory* in 1991. Steven Duane Brown published the *Values-Based Model of Career and Life-Role Choices and Satisfaction* in 1996.

Super's Life Stage Theory Focused Role Of Self-Concept In Career Development

Theorist Donald Super (1957) viewed the career decision-making process as a series of natural life-stages. Super recognized the importance of the development and implementation of a self-concept as a core element of the career development process. Swanson and Fouad stated

that “one of the hallmarks of Super’s theory was that vocational development was viewed as is a process of making several decisions which culminate in vocational choices that represent an implementation of the self-concept” (1999, p. 83). Super stated “the self-concept refers to how individuals view themselves and their situations” (Sharf, 2006, p. 152). Super saw self-concept as “the combination of biological characteristics, the social roles individuals play, and evaluations of the reaction other individuals have to the person” (Sharf, 2006, p. 154).

Super (1990) found that as youth formed a deeper awareness and understanding of themselves during adolescence, they also grew in their sense of gender identity, and began to clarify their view of the world around them. Super (1994) believed a stronger sense of self began to emerge in late childhood or early adolescence; and that the self-concept is influenced by a combination of background characteristics, views on the social roles which genders are expected to play, and perceptions of the reactions one receives from others. Super viewed the career development process of youth as being driven by curiosity, and that curiosity is satisfied through exploration. Super claimed that “exploratory activity leads to the acquisition of information regarding occupational options” (Sharf, 2006, p. 154), and therefore helps shape the career development process. Super proposed that “interaction with society also brings about the development of the self-concept” (Sharf, 2006; p. 154). According to Super, a sense of self begins to emerge in late childhood or early adolescence. As the individual interacts with family, peers, and coworkers, they learn how he or she is similar or different from other people through experiences and personal influences (Super, 1957).

Super believed that information individuals discover about their environment, and the process by which they explore people and objects in the environment, does affect the development of the self-concept. “Exploring behavior will lead to gathering information; and

experiences with key figures will eventually help youth develop and express interest in some activities, and lack interest in others” (Sharf, 2006, p. 154). Super believed the majority of career choices are ruled in, or ruled out, by late adolescence (Super, 1994).

Holland’s Trait and Factor Theory Identified Occupational Personalities

John Holland’s trait and factor theory “was examined through more than 500 studies, which is more research than has been conducted on any other career development theory” (Sharf, 2006; p. 103). Holland viewed the vocational selection process based on the need for congruence between one’s individual traits and those needed of the occupation and workplace environment (Holland, 1997). “Congruence refers to the relationship of the personality to the environment; and the more similar the personality to the environment, the more congruent the relationship” (Sharf, 2006, p.103). “This sense of congruence is the most important of Holland’s concepts, and the most widely researched” (Scharf, 2006, p. 103).

Holland’s trait and factor theory maintained that by late adolescence most people come to resemble a combination of six vocational personality types (RIASEC) Realistic, Investigative, Artistic, Social, Enterprising, and Conventional. The Realistic type likes realistic jobs such as automobile mechanic, aircraft controller, surveyor, farmer, or electrician. The Investigative types like investigative jobs such as biologist, chemist, physicist, anthropologist, geologist, or medical technologist. The Artistic type likes artistic jobs such as composer, musician, stage director, writer, interior decorator, or actor. The Social type likes social jobs such as teacher, religious worker, counselor, clinical psychologist, or speech therapist. The Enterprising type likes enterprising jobs such as salesperson, manager, business executive, sports promoter, or buyer. The Conventional type likes conventional jobs such as bookkeeper, financial analyst, banker, tax expert, or stenographer (as identified by Spokane & Cruza-Guet (2005), p. 25). Perceptions of

the type of workers and the personalities of individuals who work in occupations can also influence whether or not youth think of an occupation as being a congruent fit with their personality and gender (Holland & Gottfredson, 1975).

Based on Holland's theory, the stronger the perceived congruence between the individual and the workplace environment, the higher likelihood the individual might express interest towards working in the occupation, and the higher expectation they could successfully work in the occupation if they chose to seek it. The perceived congruence between the gender of the worker and the type of occupation under consideration was further explored by other career development researchers seeking to understand the career choices of youth.

Theorists John Holland (1997) and Linda Gottfredson (1981) both examined the importance of perceived fit or congruence between an individual and a workplace environment on occupational choices. As summarized by other career development researchers (Blanchard & Lichtenberg, 2003; Loftquist & Dawis, 1991), the findings of research lead by both Holland and Gottfredson supported claims that career aspirations were most often based on both perceived compatibility and fit with the workplace environment, as well as perceived ease of accessibility of the occupation to the career seeker.

Gottfredson's Theory Of Circumscription and Compromise Targeted Choice

Contemporary career development researcher Linda Gottfredson formed the theory of circumscription and compromise to examine how youth consider, eliminate, or accept viable career options during late childhood and early adolescence (1981). Gottfredson's theory examined the process youth take to identify viable career options and how youth then gradually eliminate desirable occupations as they narrow down to claim interest in fewer, more accessible, occupational options (1981). Authors Henderson, Hesketh, & Tuffin (1988) described

Gottfredson's theory on circumscription as the process whereby a youth will progressively eliminate unacceptable career alternatives, leaving only acceptable career options for further exploration. Authors Lapan & Jingseski work (1992) noted the circumscription of vocational aspirations has been shown to begin in early childhood with children identifying segments of the occupational world as unattainable (Lapan & Jingeleski, 1992). Gottfredson described compromise, in her words captured by editors R.S. Sharf (2006), to be:

a period whereby youth will continue to modify his or her career options, and may ultimately accept a less attractive career option than they would have initially hoped to achieve; most often because they deem the occupation to be more easily attainable for them (p. 157).

Blanchard and Lichtenberg (2001) wrote of Gottfredson's view on circumscription and compromise:

In a way, compromise is the opposite of circumscription. Instead of eliminating alternatives that seem unacceptable; compromise is the process of eliminating preferred alternatives due to obstacles that the individual perceives as insurmountable" (p. 251).

Authors Swanson & Fouad described Gottfredson's contributions to include a deeper understanding of the conscious stages adolescents engage in as they search for occupations which are viewed as being compatible with their more personal, psychological selves (Swanson & Fouad, 1999, p. 86). Gottfredson noted in her research findings:

As youth move through the career development stages they successively reject occupations they consider to be unsuitable for their gender to perform, or inappropriate for their social class or ability level; or reject occupations unsuitable for their personal interests and values (Gottfredson, 1981; p. 548). Gottfredson stated: "the occupations an individual selects will most likely be considered not only to be compatible with their own view of themselves; but

also viewed as accessible and attainable” (Sharf, 2006, p. 156). As noted by authors Blanchard & Lichtenbert (2003):

Gottfredson’s theory on the stages of circumscription and compromise includes her breakthrough thinking on a “zone of acceptable alternatives, or a range of occupations, which the person considers to be acceptable options or alternatives” during the career development process (Blanchard & Lichtenbert, 2003, p. 251).

Gottfredson wrote: “vocational choice is a highly public way of asserting who we are... and we are social beings and therefore, exquisitely sensitive to where we fit, or would like to fit, into society” (Gottfredson, 2005, p. 77).

Adolescence is a Critical Juncture in Career Development

As asserted within the works of Donald Super’s life stage theory, John Holland’s trait and factor theory, and Linda Gottfredson’s theory of circumscription and compromise, adolescence is a critical juncture in an individual’s natural life stage career development process. These researchers have found youth feel forced to consider, eliminate, and choose occupational options based on the occupation’s perceived fit, acceptability, and accessibility to the youth’s gender. Too often the process of considering or disliking a potential career choice is made without the benefit of an individual ever having gained direct knowledge or had the type of direct or indirect work-based and learning experiences which could help guide the decision-making process. As noted by author Jepson in his research which examined the occupational decision-making process of youth, “the most influential period for career commitment is considered to be during the period of adolescence and early adulthood, when important decisions about one’s future are made” (Jepson, 1975, p. 228).

Gender Restricts Expression and Exploration of Occupational Interests

Many authors conclude there are a variety of significant influences which directly or indirectly help shape, open, or restrict the occupational interests of youth (Auger, Blackhurst & Wahl, 2005; Creed & Patton, 2003; Hawley McWhirter, 1997; Mau & Bikos, 2000; Mullis, Mullis & Gervels, 1998).

Above any other factor, however, study after study found gender to be one of the most restricting factors affecting the occupational interests. Research on the role gender plays on the formation of occupational interests is lengthy. Archer found “an individual’s gender role orientation affects a number of related behaviors, including occupational choice” (Archer, 1989, p. 94).

Gottfredson published how the career decision-making process is most often influenced and directed by gender-based occupational stereotypes, and how these stereotypes serve as a guide for youth as they identify acceptable occupational options (Gottfredson, 1981), stating: “Children learn stereotypes at ages as young as 2 to 3 years old, and begin to incorporate traditional gender roles into considerations of careers between age 6 to 8, or grades 1 through 3” (p. 286).

Research conducted by Schlossberg and Goodman (1972) also found that sex-role stereotyping begins at an early age and affects children’s perceptions of occupations.

Regarding sex-role stereotyping on occupational interests Gottfredson & Lapan wrote:

In effect, the stereotypical sex-typing of occupations exerts a circumscribing influence on the career choices of children, adolescents, and young adults because of perceived characteristics of the worker and the work needing to be done (Gottfredson & Lapan, 1997, p. 137).

Sex-Role Stereotyping of Occupations Restricts Occupational Interests

Author Fassinger examined research which had been conducted examining the unique issues affecting the career development outcomes for women and stated:

Research on the development of occupational stereotypes indicates gender-based occupational stereotypes are formed in early childhood as fantasies, and give way in late childhood and early adolescence to focus on the perceived social value and status of occupational options (Fassinger, 2004, p. 104).

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Francis' research in 2002 examined outcomes of prior studies lead by Nemerowicz (1979), Spender (1982), Best (1983) and Adams & Walkerdine (1986), and integrated these findings in his research findings which showed girls tended to opt for a narrower range of stereotypically feminine occupations, and view fewer jobs as being appropriate or open to them (Francis, 2002, p. 80). Betz research also built on the findings of prior studies and showed how people consistently rate occupations as either masculine or feminine (Betz, 2005, p. 259).

Betz found gender stereotypes affect career choices as a result of direct and indirect associations youth made towards working in different workplace environments (Betz, 2005, p. 257). Betz noted her research built on prior studies conducted in 1975 by Shinar which found:

the occupational titles of miner, federal judge, engineer, physicist, and heavy equipment operator are judged to be highly masculine occupations; while nurse, receptionist, elementary schoolteacher, and dietician are judged to be highly feminine occupational choices (Betz, 2005, p. 259).

Silverman and Pritchard work examining female interest in technology found young girls perceived careers in technology as being “male” occupations, and science is perceived as being “masculine, hard, complex, and difficult” by young females (Silverman & Pritchard, 1993, p. 6). Researcher and author, Becky Francis found that “career choices of girls and boys reflect to some extent a deeply embedded gender dichotomy; and career choices demonstrate little recognition of changes in the adult employment market” (Francis, 2002, p. 166). Researchers Herr and Cramer (1996) noted that “women in adolescence and young adulthood demonstrate they select from only a few occupational possibilities all too often on a sex-type basis” (Herr & Cramer, 1996, p. 260). As was noted by Betz:

though women have made progress entering traditionally male-dominated professions, such as medicine and law where half of the entering students are women, the occupational world still has many areas of extreme sex segregation... for example more than 90% of preschool or kindergarten teachers, dental hygienists, secretaries, child-care workers, cleaners and servers, nurses, and occupational speech therapists are women (Betz, 2005, p. 259).

Phillips and Imhoff published research in 1997 which suggested occupational stereotypes are held more strongly by males than females. This assumption was also supported by the work of Fassinger who found “occupational stereotypes are retained through adolescence and early adulthood despite an increasingly individual focus, are reinforced in the media, and exhibit

incontrovertible influence on role identification and vocational beliefs in young people (Fassinger, 2004, p. 99).

Research by White & Oueletter (1980) and Franken (1983) both demonstrated that boys appear to engage in greater sex-typing of occupations than girls, and that girls were more likely to aspire to non-traditional occupations than were boys. Research by Francis (1998) and Pickering (1997) suggest boys may be less willing than girls to experiment with working in a non-traditional occupation for a male worker to perform.

Non-Traditional Role Models Can Reverse Negative Stereotypes

Research finds gaining knowledge about occupations, as well as viewing atypical role modeling of workers performing occupations, can decrease the impact of gender-based occupational stereotyping (Phillips & Imhoff, 1997). Gibson viewed role models as people whose lives and activities influence another person in some way (Gibson, 2004, p. 136). Quimby and O'Brien's work (2004) found role modeling can affect ultimate career choice. Works by Quimby and Desantos noted: "research has shown a relationship between role model influence and a variety of career-related outcomes, including attitudes towards working in "non-traditional" careers (Quimby & Desantos, 2006, p. 299).

Educational researcher S.H. Schunk (2004) found by observing others, people acquire knowledge, roles, skills, strategies, beliefs, and attitudes. Schunk (2004) reported: "Individuals learn from models the usefulness and appropriateness of behaviors and they act in accordance with beliefs about the capabilities and expected outcomes of their actions" (Schunk, 2004, p. 83). Schunk also found that one's similarity to the role model is hypothesized as an important factor in gauging behavioral appropriateness and forming beliefs. Schunk stated: "the more observers

are like models, the greater the probability they will consider similar actions socially appropriate and will produce comparable results” (Schunk, 2004, p. 101).

Other researchers have found role models may be especially important to the career development of women, given there is a lack of female role models in non-traditional careers (e.g., engineering, science). The lack of female role models in non-traditional occupations has been noted through the works of many researchers as a major barrier for women who choose to enter these non-traditional professions. The words of many authors (Basoc & Howe, 1979; Betz, 1994; Gilbert, 1985; Guttman & Juli, 1991; Hackett, Esposito & O’Halloran, 1989; Piper, 1994; Savenye, 1992; Smith & Erb, 1986; and Bandura, Barbaracelli, Capara, and Pastorelli (2001) predict that largely due to women being disinclined to choose careers in the type of scientific and technical occupations traditionally dominated by men, these occupations will most likely continue to lack sufficient numbers of female role models in the workplace. A lack of female role models undermines efforts to interest young women in male-dominated industries .

Trends Reflect Shifts Towards More Gender Neutral Occupations

Some research has found a broadening of occupational considerations by male and female youth in recent years. In contrast to research findings of Looft (1971b) which found girls were likely to primarily aspire to highly sex-typed careers, more recent research of numerous authors indicates the career aspirations of female youth appear to be broadening considerably (Bobo, Hildreth, and Durodaye, 1998; Helwig, 2004; Liben, Bigler & Krogh, 2001; Gaudet & Savole, 2007; Wigfield, Battle, Keller, and Eccles, 2002). However, other researchers (Adams & Hicken, 1984; Liben & Bigler, 2002; Miller & Stanford, 1997) have found that even though girls are beginning to broaden their range of occupational preferences, their expectations for occupational attainment remain low towards high status and male sex-typed occupations. Studies by

Blackhurst and Auger (2008), however, raise hope that more female youth appear to be drawn to filling the high skilled workforce pipeline than did their female predecessors.

This shift in increased interest of female workers towards traditionally male sex-typed occupations was reported in 2005 by the U.S. Department of Labor Bureau of Labor Statistics in their *Occupational Outlook Quarterly* (Winter 2004 – 2005). This report found “some occupations are becoming more gender-neutral” (BLS, 2004, p. 48). As paraphrased from the findings of this report:

Some of the greatest shifts of women into male-dominated occupations are found in the automobile body and related repairers occupations, which reported a 369% growth in women employees from 1983 – 2002. Other female worker increases in male-dominated occupations include a 360% increase in female supervisors and police detectives; 315% increase in female millwrights; 186% increase in female civil engineers; and 177% increase in female automobile mechanics (BLS, 2004, page 48).

The Bureau of Labor Statistics of 2004 - 2005 found less distinctive increases reported of male workers entering female professions. The most notable was the reporting of a 277% increase in male employees working as dressmakers; 78% increase in male licensed practical nurses; 71% increase in male registered nurses; 44% increase in male personal housekeepers; 42% increase in male secretaries; 39% increase in male typists; and 39% increase in the number of male pre-k and kindergarten teachers (paraphrased from BLS, 2004, p. 48 - 58).

Card Sort Exercises Serve as Tool to Measure Occupational Interests

Vocational card sort exercises have been used to assess occupational interests for more than fifty years. Many authors have noted the use of the vocational card sort methodology as an

effective measurement tool of occupational interests (Goldman, 1982; Slancy & Mackinnon-Slaney, 1991; Tetting, 1988; Thomas, Johnson, Behnke, Bayer, 2005).

Leona Tyler (1961) is credited with pioneering the vocational card sort method in her research on the processes used in making occupational choices. According to Sharf, “the Vocational Card Sort (VCS) was developed by Tyler (1961), and refined by Dolliver (1967)” (Sharf, 2006, p. 270). Tyler published a description of how to use the card sort method in vocational counseling in the *Journal of Counseling Psychology* in 1967. Author Val Butcher described Tyler’s vocational card sort decks as a group of 60 - 100 cards which held the name of the occupation on one side of the card, and a description and entry requirements for the occupation on the other side of the card (Butcher, 2008, p. 2). Butcher assessed the card sort exercise built on Tyler’s earlier vocational interest inventories, but was recognized as putting more control in the hands of participants as they physically sorted the vocational cards into piles representing those they liked, disliked, or were neutral about (Butcher, 2008, p 3).

Sharf (2006) published works describing Tyler’s card sort methods, emphasizing:

the card sort process is one of reflecting on the meaning various occupations hold for the client, understanding how the client is making distinctions between occupations, and identifying the most important considerations for the client in making a vocational choice (Sharf, 2006, p. 153).

Building on the early work of Tyler, John Holland, Ph.D. created vocational card sort assessment tools and published the Vocational Exploration and Insight Kit (VEIK) in 1992. Holland’s vocational card sort exercise included 84 occupations which individual sorted into piles representing those occupational tasks they *Would Not Choose*, *In Question*, and *Might Choose* to perform in the workplace (Reardon & Lentz, 2003).

Tettering illustrated detailed procedures for developing, structuring, and implementing a card sort design strategy building on the work of Tyler and Holland, stating:

Most researchers agree that (a) content for the card sort should be developed from the literature of a field or discipline; (b) items to be sorted or ranked should be placed on individual cards; (c) respondents should be asked to sort a predetermined number of cards into a specific number of piles; (d) desirable range for the numbers of cards to sorted range between 40 and 100; (e) items be sorted into uneven numbers of piles that reflect a continuum (greatest to least, highest priority to least priority); and (f) at a later date the same individuals sort the same items with a different set of instructions (Tettering, 1998, p. 758).

Author Judith Rasband's *Educational Sorts: A Strategy for Teaching and Learning* (2008) also found vocational card sorts to be a stimulating, effective, and economical strategy for teaching and learning in the classroom. Her work supported the findings of other research which validated the use of the card sort design for the assessment of occupational interests.

O*NET Listing of Occupational Titles, Tasks, Tools and Technologies

This vocational card sort design utilizes resources from the U.S. Department of Labor's Employment and Training Administration O*NET Resource Center <http://www.onetcenter.org>. Occupational information depicted on each card, including occupational titles, occupational tasks, workplace environments, and tools and technologies used by workers in each of the occupations, was derived from the O*NET occupational database available for public use. The O*NET stores information on generalized work activities and job behaviors that apply across thousands of occupations (Rose, 2009). The O*NET is considered a primary database for the collection of occupational-related data for government, educators, and researchers.

CHAPTER 3

RESEARCH METHODS

The purpose of this study was to measure the degree of interest expressed by male and female youth towards working in 60 of the nation's fastest growing occupations. The study used a vocational card sort methodology to capture the expressed interests of youth toward holding the occupational titles, performing the occupational tasks, using the type of tools and technologies, and working in the type of workplace environments experienced by workers in each occupation.

More specifically, data was collected to measure whether significant differences were found in the degree of occupational interests expressed by male and female youth towards working in a diverse mix of traditional, non-traditional, and gender neutral occupations deemed to be accessible to youth in the 21st century workplace.

Sample Population

The study sampling procedures invited principals from a total of 24 high schools located in rural counties of southern Illinois (Perry, Franklin, Jackson, Jefferson, and Williamson) to volunteer to serve as a host site for the study. Principals were contacted by mail and by telephone encouraging their school's participation in recruiting teachers to host the study with youth. A copy of the recruitment letter used to recruit high school principals is found in Appendix A.

To host the study, each principal was asked to identify one or two host teachers who would allow the study to be conducted in their classrooms during a regular classroom period. Each class was also required to provide a mix of male and female youth for involvement in the study, A minimum of 45 minutes during the class period was required for youth to complete the vocational card sort exercises at their desk. Host teachers were provided a \$25 gift card. Copies of both the Individual Assent Form and Parental Consent Forms are in Appendix B.

Procedures

To initiate the study within each classroom, youth were provided an ID coded research packet with a demographic data card attached for recording of the name, gender, grade-level, high school, and classroom of each youth participant in the study. Within each research packet were four decks of vocational cards for youth to read and sort into piles (1 – 5) at their desk. Each deck of cards contained 60 cards, with one card created within each deck to represent characteristics of the 60 occupations examined in the study.

The first vocational card deck (A) listed by word and phrase the common occupational tasks performed by workers in each occupation. The second vocational card deck (B) listed characteristics of the workplace environment for each occupation. The third vocational card deck (C) listed the occupational title of each occupation. The fourth vocational card deck (D) listed the type of tools and technology used by workers in each of the 60 occupations examined.

To initiate the data collection process, instructions were provided by the investigator prior to data collection. Youth were asked to review and sort cards from each deck one at a time, and into piles (1 – 5) at their desk. Sorting a card into pile (1) expressed *Strong Dislike*; pile (2) *Dislike*; pile (3) *No Interest*; pile (4) *Some Interest*; and pile (5) *Strong Interest* towards the occupational information depicted on each card.

At the completion of the vocational card sorting exercise, youth were instructed to pick up each pile of cards (1 – 5) and place the cards into the pre-numbered envelopes (1 – 5) provided in their research packet. Youth sealed the vocational card sort results from each pile (1 – 5) into each envelope (1 – 5) and placed the sealed envelopes of vocational card sort results into their ID coded research packet. Each youth returned their sealed packets containing their vocational card sort results to the investigator at the end of the classroom period.

Measures

A vocational card sort exercise was created as the measurement tool capture Total Occupational Interest Scores of each youth toward working in each occupation examined.

Vocational Card Sort Exercise Used for Scoring Occupational Interests

The vocational card sort exercises used tested techniques successfully performed in career counseling interventions for more than 50 years (Holland, 1992; Tyler, 1961). The vocational card sort exercise used card sort scores from four separate vocational card decks measuring youth interest in performing the type of occupational tasks (A), working in the type of workplace environments (B), holding the type of occupational titles (C), and using the type of tools and technology (D) commonly required of workers in 60 fast growing occupations.

The high job growth occupations selected for inclusion in the study were created using information provided for public use by the O*NET On-Line Resource Center which is administered by the U.S. Department of Labor Bureau of Labor Statistics. The O*NET Resource Center allow users to look at occupational profiles describing the most important characteristics of an occupation, task requirements, experience, and technology requirements (Farr & Sharkin, 2004; Dierdorff, Drewes, Norton, 2006; Rivkin & Lewis, 1999).

Information representing the occupational titles, tasks, tools, technologies, and workplace characteristics for each occupation was gathered through the O*NET Resource Center and the O*NET On-Line Occupational Information Network website found at <http://www.onetcenter.org> in the month of November 2009. The occupations included for examination in the study were from the automotive, advanced manufacturing, biotechnology, construction, geospatial technology, energy services, financial services, health care and social services, homeland security, hospitality, information technology, retail trade, and transportation industries.

Occupations Examined in Vocational Card Sort Exercises

Advanced manufacturing industry. The occupations industrial engineer; robotics technician; and chemical engineer represented this industry.

Biotechnology industry. The occupations biomedical engineer; biological technician; and chemist represented this industry.

Construction industry. The occupations carpenter; architect; welder / solder / brazer; and electrician represented this industry.

Geospatial technologies industry. The occupations cartographer / photogrammetrist; and land surveyor represented this industry.

Green energy industry. The occupations wind energy engineer; solar energy engineer; environmental scientist; hydrologist; HVAC maintenance technician; green product marketer; agricultural technician / farmer; and urban / regional planner represented this industry.

Financial services industry. The occupations personal financial advisor and accountant represented this industry.

Health care and social services. The occupations physician assistant; medical doctor; physical therapist; registered nurse; counseling psychologist; veterinary technologist; human and social services assistant; radiological technician; EMT / paramedic; pharmacy technician; chiropractor; medical records health information technician; dental hygienist; personal home care aide; speech pathologist; and coroner represented this industry.

Homeland security industry. The occupations police detective; security guard; public school teacher; lawyer; municipal firefighter; insurance examiner / adjustor; and hazardous waste removal worker represented this industry.

Hospitality industry. The occupations chef / head cook; dietician / nutritionist; and lodging manager represented this industry.

Information technology industry. The occupations management analyst; database administrator; network systems analyst; and computer software engineer represented this industry.

Retail trade industry. The occupations chief executive officer; retail sales manager; and executive administrative assistant represented this industry.

Transportation industry. The occupations automobile services mechanic; airline pilot; logistician; truck driver; and railroad conductor / yardmaster represented this industry.

The mix of 60 occupations included 25 male sex-typed occupations, 15 female sex-typed occupations, 14 gender-neutral roles, and 6 new and emerging occupations in the 21st century green energy industry. The complete set cards created by the investigator to represent each of the 60 occupations across the four decks of vocational cards are included in Appendix E.

Pilot study procedures were used to finalize vocational card exercises. A pilot study was conducted prior to official data collection to test the timing of the vocational card sort exercises with a voluntary group of high school youth. Feedback from participants allowed for adjustments to the reading of instructions and data collection procedures which allowed the study to be completed during the allotted classroom period.

Data Analysis

Following the completion of all data collection activities, each ID coded research packet was unsealed separately by the researcher, and card sort scores recorded based on the envelope (1 – 5) each card had been placed in by each youth participant. Each score was hand-coded and results entered into SPSS datasets for analysis.

The Total Occupational Interest Scores recorded by each youth toward each occupation was the primary data element examined for analysis through the study. Stringent alpha levels were established using Bonferroni procedures recommended for testing multiple comparisons. The significance level was set at .00083* (.05/60 contrasts) to correctly set the p-value to account for the increased probability of a Type 1 error rate caused by the testing of multiple comparisons.

Data Analysis for Research Question (1)

What were the expressed occupational interests of youth toward working in each occupation? Data analysis used descriptive statistics for the mean, median, mode, standard deviation, and frequency distribution of group scores for this question.

Data Analysis for Research Question (2)

To what degree were there significant differences in the degree of occupational interest expressed by male and female youth toward each occupation? A series of independent t-tests compared mean (M) and (SD) values of Total Occupational Interest Scores for groups of male and female youth toward each occupation.

Data Analysis for Research Question (3)

To what degree did the proportion of male and female youth expressing interest in working in non-traditional “sex-typed” occupations for each gender to perform in the workplace significantly differ? A Pearson’s Chi-Square Cross-Tabs analysis was used to identify differences in the proportion of male and female who expressed interest in performing the non-traditional, traditional, and gender-neutral occupations examined in the study.

In summary, this chapter shared the research methodology utilizing a vocational card sort design, procedures for collecting data through classroom-based exercises with high school youth, and the steps for data analysis procedures to answer each of the primary research questions.

CHAPTER 4

RESULTS

This chapter provides an overview of the study's purpose, sample demographics, treatment of data, and significant findings based on the results of a series of classroom-based vocational card sort exercises completed by rural high school youth in southern Illinois.

Purpose of the Study

The purpose of the study was to measure the degree of interest expressed by male and female youth towards working in 60 of the nation's fastest growing occupations, most of which also face critical shortages of workers today. The study design used a vocational card sort methodology to capture the degree of interest or disinterest expressed by each youth toward each occupation.

The study measured significant differences in the degree of interest expressed by youth towards working in traditional, non-traditional, and gender-neutral occupations for each gender to perform in the workplace. Findings also examined differences in expressed interest toward working in S.T.E.M (Science, Technology, Engineering, and Mathematics) occupations.

To better understand the effect of gender on expressed occupational interests, the study examined a set of 60 occupations found in 12 high job growth industries. Within the 60 occupations examined were 25 occupations considered to be sex-typed for male workers to perform, 15 occupations sex-typed for female workers to perform, 14 occupations considered to be gender neutral, and 6 new and emerging 21st century green energy occupations.

Demographics of Participants

The sample of youth participants included 139 youth (males, 65; females, 74) age 15 to 18 years old, from a mix of rural high schools in southern Illinois. The ethnic and racial demographics of the youth sample were primarily white Caucasian youth, with a small number

of African-American and Latino youth participants in some of the larger classrooms. Five high schools participated in the study. Vocational card sort exercises were conducted with 139 youth who were in attendance at one of seven classrooms who hosted the study during a regularly scheduled classroom period from February 25, 2010 – May 10, 2010.

The schools participating in the study were rural in nature, and none were located near any metropolitan areas. The principals of each high school identified the host teachers for the study. Classes which hosted the study were *Consumer Education*, *Business Math*, *Introduction to Agricultural Industries*, *Resource Management*, *On-The-Job Training*, and *Introduction to Health Sciences*. Each youth completed an Individual Assent Form, and submitted a Parental Consent Form to participate in the study. A copy of the letter used to invite high schools to participate in the study is included in Appendix A. Copies of the type of Individual Assent Form and Parental Consent form used in the study are provided in Appendix B.

Procedures

To initiate the vocational card sort exercise in each classroom, youth were provided with an ID coded research packet. The research packet was used for the distribution of vocational card decks and envelopes, and used for the final collection of vocational card sort results.

Within each research packet were four decks of vocational cards labeled A, B, C, D and five envelopes labeled (1, 2, 3, 4, 5). To ensure accurate data collection procedures, youth were instructed to place each of the five labeled envelopes from the packet in ascending order (1 – 5) across the top of their desk. Youth were asked to remove each deck of cards one at a time, and to read and sort each of the cards from each deck into pile (1 – 5) to express interest or disinterest towards the occupational information depicted on the card. Youth were allowed to remove, read,

and sort the decks of cards in any order they chose. Each youth worked independently at their desk to complete the vocational card sorting exercise within a 45 minute classroom period.

Each deck of vocational cards contained a total of 60 cards, with one card used to represent each occupation in each deck. Youth sorted a total of 240 vocational cards from the four decks (A+B+C+D) used as a part of this study. Youth sorted each of the cards into piles (1 – 5) at their desk. Youth were instructed that the placement of the card into pile (1) expressed *Strong Dislike*; pile (2) expressed *Dislike*; pile (3) expressed *No Interest*; pile (4) expressed *Some Interest*; and pile (5) expressed *Strong Interest* towards the occupational information depicted on each card.

After sorting all decks of cards into piles (1 – 5), youth collected each pile of cards (1 – 5) and placed each pile of cards into the labeled envelope (1 – 5) provided in their research packet. Youth sealed their vocational card sort results from pile (1 – 5) into each labeled envelope (1 – 5), and returned their ID coded research packet containing sealed vocational card sort results to the investigator at the end of the classroom period.

Youth were self-paced as they read each card and reflected on whether or not they were interested in working in a wide variety of occupations examined through the study. Through the exercise youth were given the opportunity to read about a variety of occupational titles, tasks, tools and technology, and workplace environments. Each vocational card designed for use in this study was created using information provided free for public use through the U.S. Department of Labor O*NET Resource Center. Materials used were created from information retrieved at <http://www.onetcenter.org>. All vocational card sets are provided in Appendix E.

Treatment of the Data

To complete the data collection process and prepare the vocational card sort results of each classroom session for statistical analysis, the researcher carefully unsealed and recorded the card

sort results from each coded ID research packet separately. Results of vocational card sort scores were linked by name, school, and classroom in a separate data file, using the Individual Consent Forms which each youth placed in their ID coded research packet. This identifying information was kept confidential in the reporting of all study findings for this paper.

The vocational card sort score (1 – 5) for each card through the exercise was dependent on the selected pile placement for the card by the youth through the exercise. Youth sorted a total of 240 cards into piles (1 -5) at their desk, and then collected piles of cards from each stack to place back in envelopes labeled (1 – 5) for the data collection process. The researcher carefully opened and scored each envelope of card sort results separately and recorded findings for scores for each youth. The Total Occupational Interest Score was based on the summation four cards for each occupation from deck (A+B+C+D) through the vocational card sort exercise. Each card sort score was based on the selected pile placement (1 – 5) by the youth through the exercise.

Total Occupational Interest Score Indicators

The Total Occupational Interest Score was a measure of the degree of interest expressed by each youth toward performing the occupational tasks (deck A), working in the workplace environment (deck B), holding the occupational titles (deck C), and using the tools and technology (deck D) commonly used by workers in each role.

Any combination of vocational card sort scores could be recorded by youth through the sorting exercise, given the youth was in control of whether to place any or all cards sorted into any or all piles (1 – 5) during the exercise. Given the selected pile placement (1 – 5) of each card was identified as the measurement score of occupational interests, the Total Occupational Interest Scores reflects the overall degree of expressed interest or dislike by each youth toward working in each occupation.

As shown in Table 1, Total Occupational Interest Scores could range from 4 points (*Strong Dislike*) to maximum of 20 points (*Strong Interest*) based on selected card pile placement scores.

Table 1

The Total Occupational Interest Score Range Indicators of Occupational Interest

Strong Interest (Pile 5 card found) Total	Deck A Card sort score from Pile #	Deck B Card sort score from Pile #	Deck C Card sort score from Pile #	Deck D Card sort score from Pile #
20	5	5	5	5
19	5	5	5	4
18	5	5	4	4
17	4	5	4	4
Some Interest (Pile 4 card found) Total	Deck A Card sort score from Pile #	Deck B Card sort score from Pile #	Deck C Card sort score from Pile #	Deck D Card sort score from Pile #
16	4	4	4	4
15	4	4	4	3
14	3	3	4	4
13	4	3	3	3
No Interest (Pile 3 card found) Total	Deck A Card sort score from Pile #	Deck B Card sort score from Pile #	Deck C Card sort score from Pile #	Deck D Card sort score from Pile #
12	3	3	3	3
11	3	3	3	2
10	3	3	2	2
9	2	2	2	3
Some Dislike (Pile 2 card found) Total	Deck A Card sort score from Pile #	Deck B Card sort score from Pile #	Deck C Card sort score from Pile #	Deck D Card sort score from Pile #
8	2	2	2	2
7	2	2	2	1
6	1	1	2	2
5	1	1	1	2
Strong Dislike (Pile 1 card found) Total	Deck A Card sort score from Pile #	Deck B Card sort score from Pile #	Deck C Card sort score from Pile #	Deck D Card sort score from Pile #
4	1	1	1	1

For the purposes of this study, a Total Occupational Interest Score of 20 points is interpreted to reflect *Strong Interest* by the youth toward the occupation, as the score of 20 points could only

be attained by the placement of each of the four cards for each occupation from each deck into pile (5) . Placing a vocational card into pile (5) reflects *Strong Interest* in the occupation.

A Total Occupational Interest Score of 4 points, conversely, reflects *Strong Dislike* towards the occupation given the only combination of four card sort scores which could produce a score of 4 points from deck (A, B, C, D) was the result of placing of each occupation's card into pile (1) through the vocational card sort exercise. Placing a vocational card into pile (1) reflects *Strong Dislike* toward that aspect of the occupation depicted on the card.

For the purposes of reporting study findings, a Total Occupational Interest Score for any occupation which exceeds a 12.00 point mean for the group of male and female youth was identified as an occupation of interest to youth. This interest indicator threshold requiring the Total Occupational Interest Score to exceed 12.00 points is based on the following assumptions:

- 1) For a Total Occupational Interest Score result to exceed 12.00 points, the youth must have sorted at least one of the four cards from decks (A, B, C, D) into pile (4) or pile (5), indicating youth expressed at least Some Interest or Strong Interest toward the role.
- 2) Given the expected result of a youth sorting each of four vocational cards from decks (A+B+C+D) into pile (3) No Interest would result in a Total Occupational Interest Score of 12.00 points (3+3+3+3), it is determined that a score which falls below 12.00 points reflects at best *No Interest, Dislike, or Strong Dislike* toward the occupation.
- 3) Therefore, the Total Occupational Interest Score must exceed a mean of 12.00 points to pass the interest indicator threshold and reflect at least Some Interest toward the role.

The Total Occupational Interest Score was the primary data source used for the ranking and reporting of occupational interest results (1st through 60th) for the study. The Total Occupational Interest Score rankings of each occupation are found in Appendix C. In addition, a complete set

of frequency distribution tables which illustrate results from the sorting of vocational card decks by male and female youth toward each of the 60 occupations examined is in Appendix D.

The findings present an overall ranking of occupational interest based on the vocational card sort results of male and female youth toward working in occupations from health care, homeland security, hospitality, construction, retail trade, geospatial technology, financial services, biotechnology, transportation, information technology, advanced manufacturing, and the green energy industry for the study. Findings are presented through a series of tables and short summary narratives to address each of the three research questions examined in the study.

Research Questions

1. What were the expressed occupational interests of youth towards working in each of the 60 high job growth occupations examined in the study?
2. To what degree were there significant differences in the degree of occupational interest expressed by male and female youth towards working in each occupation?
3. To what degree did the proportion of male and female youth expressing interest in working in “sex-typed” and/or non-traditional occupations significantly differ?

Findings

The findings address three primary research questions using vocational card sort results. The data analysis procedures are described with for each question and significant findings noted.

Research question (1)

What were the expressed occupational interests of male and female youth towards working in each of the 60 high job growth occupations examined in the study?

Findings for research question (1). Findings in Table 2 display the highest ranking (1st through 20th) occupations of most interest, based on Total Occupational Interest Score results.

Table 2

Rank-Order of Top 20 Occupational Interest Scores Reported by All Youth (n = 139)

Rank Order (1 – 20)	Occupational Title	N	Sum	Sample Mean	Male Mean	Female Mean	Median	Mode	Variance
(1)	Police Detective	139	1883	13.55	13.67	13.47	14.00	20.00	20.583
(2)	Physician Assistant	139	1748	12.53	9.94	14.89	13.00	9.00	19.898
(3)	Medical Doctor	139	1746	12.56	10.09	14.73	13.00	11.00	17.538
(4)	Physical Therapist	139	1727	12.42	11.26	13.45	13.00	13.00	11.724
(5)	Registered Nurse	139	1693	12.18	9.26	14.74	12.00	8.00	21.438
(6)	Counseling Psychologist	139	1687	12.14	10.95	13.18	12.00	14.00	11.162
(7)	Veterinary Technician	139	1678	12.07	11.02	13.00	12.00	11.00	12.806
(8)	Social Human Services Asst.	139	1671	12.02	10.73	13.14	12.00	10.00	12.042
(9)	Radiological Technician	139	1654	11.90	9.86	13.69	11.00	9.00	19.062
(10)	Chef or Head Cook	139	1640	11.79	11.42	12.12	11.00	16.00	21.901
(11)	Security Guard	139	1627	11.71	13.32	10.29	12.00	10.00	18.838
(12)	School Teacher	139	1617	11.63	10.97	12.57	11.00	10.00	21.915
(13)	E.M.T. / Paramedic	139	1596	11.48	9.74	13.01	11.00	7.00	18.425
(14)	Pharmacy Technician	139	1589	11.43	9.46	13.17	12.00	13.00	15.393
(15)	Lawyer	139	1585	11.40	10.23	12.43	11.00	11.00	13.489
(16)	Chiropractor	139	1585	11.40	9.54	13.04	11.00	9.00	11.822
(17)	Medical Records Technician	139	1577	11.35	8.91	13.49	11.00	11.00	16.431
(18)	Dietician or Nutritionist	139	1573	11.32	9.97	12.50	11.00	10.00	12.585
(19)	Photogrammetrist / Cartographer	139	1570	11.29	11.66	10.97	11.00	11.00	11.731
(20)	Carpenter	139	1563	11.17	13.80	8.86	11.00	7.00	22.245

As is reflected in Table 2, eight of the top 10 highest ranked occupations were in health care.

However, police detective earned the highest ranking, and was the only occupation to record a mean interest score exceeding 12 points for both groups of male and female youth.

Table 3 identifies those occupations ranked (21st through 40th) in interest to youth.

Table 3

Ranking 21st – 40th in Total Occupational Interest Scores by All Youth (n = 139)

Rank Order 40 -60	Occupational Title	Sum	Sample Mean	Male Mean	Female Mean	Median	Mode	Variance
(21)	Dental Hygienist	1557	11.20	8.71	13.39	11.00	16.00	22.597
(22)	Chief Executive Officer	1551	11.16	11.08	11.23	11.00	13.00	9.018
(23)	Automobile Service Mechanic	1548	11.14	14.06	8.57	11.00	4.00	27.728
(24)	Architect	1531	11.02	12.92	9.34	11.00	14.00	17.011
(25)	Firefighter	1530	11.01	12.63	9.58	11.00	11.00	20.964
(26)	Retail Sales Manager	1470	10.58	10.63	10.53	10.00	10.00	12.449
(27)	Agricultural Technician / Farmer	1467	10.55	11.65	9.59	9.00	6.00	22.292
(28)	Welder / Solder / Brazier	1458	10.49	13.55	7.79	10.00	4.00	26.537
(29)	Personal Home Care Aide	1451	10.44	9.55	11.22	10.00	9.00	11.176
(30)	Financial Advisor	1441	10.37	10.34	10.39	10.00	7.00	11.060
(31)	Coroner	1438	10.35	9.77	10.85	10.00	7.00	17.112
(32)	Exec. Administrative Assistant	1431	10.29	9.82	10.72	10.00	10.00	9.847
(33)	Biomedical Engineer	1428	10.27	9.25	11.18	10.00	10.00	10.548
(34)	Speech Pathologist	1428	10.27	9.08	11.32	10.00	8.00	10.983
(35)	Lodging Manager	1420	10.22	10.23	10.20	10.00	9.00	10.359
(36)	Industrial Engineer	1420	10.22	11.65	8.46	10.00	9.00	10.533
(37)	Airline Pilot	1417	10.19	12.05	8.57	9.00	6.00	20.940
(38)	Accountant	1416	10.19	9.71	10.61	10.00	11.00	9.603
(39)	Electrician	1414	10.17	13.17	7.54	9.00	8.00	21.884
(40)	Chemist	1411	10.15	9.00	11.16	10.00	9.00	11.434

As shown in Table 3, male youth expressed higher Total Occupational Interest Scores towards traditional male occupations, including automobile mechanic, welder, and airline pilot.

Table 4 presents the listing of occupations ranked 41st through 60th in overall interest to youth based on the Total Occupational Interest Scores of each occupation.

Table 4

Lowest Ranking 41st – 60th Total Occupational Interest Scores by Youth (n = 139)

Rank Order 40 -60	Occupational Title	Sum	Sample Mean	Male Mean	Female Mean	Median	Mode	Variance
(41)	Biological Technician	1402	10.09	9.56	10.46	10.00	10.00	7.761
(42)	Management Analyst	1400	10.07	10.34	9.84	10.00	9.00	9.603
(43)	Database Administrator	1395	10.04	10.79	9.38	10.00	8.00	10.441
(44)	Logistician	1390	10.00	9.95	10.04	10.00	11.00	7.942
(45)	Insurance Examiner, Adjustor	1385	9.96	9.85	10.05	10.00	9.00	8.760
(46)	Network Systems Data Analyst	1382	9.94	10.85	9.32	10.00	9.00	9.018
(47)	Computer Software Engineer	1379	9.92	11.08	8.91	9.00	8.00	14.943
(48)	HVAC Operations Maintenance	1379	9.92	11.83	8.24	10.00	9.00	12.537
(49)	Robotics Technician	1373	9.88	12.69	7.41	9.00	9.00	17.615
(50)	Urban / Regional Planner	1372	9.87	10.06	9.70	10.00	10.00	9.215
(51)	Land Surveyor	1365	9.82	11.97	7.93	9.00	10.00	14.540
(52)	Wind Energy Engineer	1350	9.71	11.62	8.04	9.00	7.00	14.583
(53)	Truck Driver	1347	9.69	12.06	7.61	9.00	7.00	20.838
(54)	Green Marketer	1312	9.44	9.83	9.09	10.00	7.00	8.770
(55)	Solar Energy Systems Engineer	1292	9.29	10.72	8.04	9.00	8.00	10.282
(56)	Chemical Engineer	1291	9.29	9.91	8.74	9.00	8.00	9.264
(57)	Railroad Conductor	1256	9.05	11.11	7.21	8.00	10.00	14.974
(58)	Environmental Scientist	1245	8.95	9.38	8.57	9.00	7.00	9.231
(59)	Hazardous Waste Removal	1223	8.80	9.71	8.00	8.00	5.00	12.829
(60)	Hydrologist	1195	8.60	9.34	7.95	8.00	6.00	9.199

As shown in Table 4, extreme differences in interest scores were recorded by male and female youth towards robotics technician, wind energy engineer, and solar energy engineer. Ranking show low female interest towards advanced manufacturing and green energy roles.

Examining Youth Interest toward High Job Growth Industries

Tables 5 provides a rank-order listing (1st through 12th) of industries which scored the highest mean Total Occupational Interest Score for the cluster of occupations from each industry.

Table 5

Industry Rankings Based on Total Occupation Interest Scores of Youth Participants

Industry Ranking by Total	Average Score	Group Mean	Male Mean	Female Mean
Occupational Interest Scores				
(1 st) Health Care	1614	11.59 (1 st)	10.42 (10 th)	13.14 (1 st)
(2 nd) Homeland Security	1550	11.15 (2 nd)	11.46 (4 th)	10.88 (4 th)
(3 rd) Hospitality	1544	11.11 (3 rd)	10.54 (8 th)	11.60 (2 nd)
(4 th) Construction	1492	10.71 (4 th)	13.36 (1 st)	8.38 (11 th)
(5 th) Retail Trade	1484	10.67 (5 th)	10.51 (9 th)	10.82 (5 th)
(6 th) Geospatial Technology	1468	10.55 (6 th)	11.81 (3 rd)	9.45 (7 th)
(7 th) Financial Services	1429	10.28 (7 th)	10.02 (11 th)	10.50 (6 th)
(8 th) Biotechnology	1414	10.17 (8 th)	9.27 (12 th)	10.93 (3 rd)
(9 th) Transportation	1392	10.014 (9 th)	11.84 (2 nd)	8.34 (10 th)
(10 th) Information Technology	1389	9.99 (10 th)	10.76 (6 th)	9.36 (8 th)
(11 th) Advanced Manufacturing	1362	9.79 (11 th)	11.41 (5 th)	8.20 (12 th)
(12 th) Green Energy Industry	1327	9.53 (12 th)	10.55 (7 th)	8.65 (9 th)

Note: Ranking (1st through 12th) is based on mean Total Occupational Interest Score of the cluster of occupations used to represent each industry.

Health care industry ranked 1st in highest interest to youth. As illustrated in Table 6, the health care industry occupations received the highest interest scores of the sample of youth.

Table 6

Total Occupational Interest Scores for Health Care Occupations

Occupational Title	Ranking (1 – 60)	Total Score	Sample Mean	Male Mean	Female Mean
Physician Assistant	2 nd	1748	12.58	9.94	14.89
Medical Doctor	3 rd	1746	12.56	10.09	14.73
Physical Therapist	4 th	1727	12.42	11.26	13.45
Registered Nurse	5 th	1693	12.18	9.26	14.74
Counseling Psychologist	6 th	1687	12.14	10.95	13.18
Veterinary Technician	7 th	1678	12.07	11.02	13.00
Social Services	8 th	1671	12.02	10.73	13.14
Radiological Technician	10 th	1654	11.90	9.86	13.69
EMT / Paramedic	13 th	1596	11.48	9.74	13.01
Pharmacy Technician	14 th	1589	11.43	9.46	13.17
Chiropractor	15 th	1585	11.40	9.54	13.04
Medical Records	17 th	1577	11.35	8.91	13.49
Dental Hygienist	21 st	1557	11.20	8.71	13.39
Home Care Aide	29 th	1451	10.44	9.55	11.22
Speech Pathologist	34 th	1428	10.27	9.08	11.32
Coroner	31 st	1438	10.35	9.77	10.85

As shown in Table 6, the health care industry received the top ranking in overall interest to youth with a mean Total Occupational Interest Score of 11.59 per occupation. The health care industry male mean Total Occupational Interest Score was 10.42 points. The health care industry female mean Total Occupational Interest Score was 13.14 points. Findings reflect female mean Total Occupational Scores exceeding the 12.00 point interest threshold for 13 of the 16 health care occupations. In contrast, there were no health care occupations scored by male youth with a mean Total Occupational Interest Score which exceeded the 12.00 point interest threshold.

Findings report higher Total Occupational Interest Scores were recorded for female youth than male youth towards each of the 16 health care occupations included in the study, including roles commonly performed by male workers. Higher female Total Occupational Interest Scores were recorded for chiropractor, medical doctor, EMT / paramedic, coroner, pharmacy technician, radiological technician, and laboratory technician, and other health care occupations which youth would quite commonly see a male worker perform in the workplace. The occupation physician assistant was the highest scoring occupation by female youth in the study.

Homeland security occupations ranked 2nd in interest to youth. The homeland security industry received the ranking of 2nd highest in overall interest to youth with a mean Total Occupational Interest Score of 11.15 points per occupation. The male mean Total Occupational Interest Score was 11.46 points. The female mean Total Occupational Interest Score was 10.88 points per occupation.

As shown in Table 7, several homeland security occupations received mean Total Occupational Interest Scores greater than 12.00 points from male youth, including police detective, security guard and firefighter. Homeland security occupations which received mean

Total Occupational Interest Scores greater than 12.00 points from female youth were police detective, school teacher and lawyer.

Table 7

Total Occupational Interest Scores for Homeland Security Occupations

Occupational Title	Ranking (1 – 60)	Total Score	Sample Mean	Male Mean	Female Mean
Police Detective	1 st	1885	13.55	13.63	13.47
Security Guard	11 th	1627	11.71	13.32	10.29
School Teacher	12 th	1617	11.63	10.87	12.57
Lawyer	16 th	1585	11.40	10.23	12.43
Firefighter	25 th	1530	11.01	12.63	9.38
Insurance Adjustor	45 th	1385	9.96	9.85	10.05
Hazardous Waste Removal	59 th	1223	8.80	9.71	8.00

As shown in Table 7, the homeland security finding illustrate some examples of extreme difference (ex. firefighter; lawyer) and striking similarities (ex. police detective; insurance adjustor) in the Total Occupational Interest Scores of male and female youth. Findings suggested both male and female youth appear to find congruence with the type of national security and emergency responder occupations, except towards hazardous waste removal roles. Findings also reflect moderate interests of male youth toward the occupation of public school teacher, though female youth expressed stronger interest in this occupation.

Hospitality industry occupations ranked 3rd in interest to youth. As shown in Table 8, the hospitality Industry ranked 3rd in overall interest to youth with a mean Total Occupational Interest Score of 11.11 points per occupation. Male and female youth expressed equal interests with a male mean Total Occupational Interest Score of 10.54 points and female mean Total Occupational Interest Score of 11.60 points.

Table 8

Total Occupational Interest Scores for Hospitality Occupations

Occupational Title	Ranking (1 – 60)	Total Score	Sample Mean	Male Mean	Female Mean
Chef / Head Cook	9 th	1640	11.79	11.42	12.12
Dietician / Nutritionist	18 th	1573	11.32	9.97	12.50
Lodging Manager	35 th	1420	10.22	10.23	10.20

As shown in Table 8, female mean Total Occupational Interest Scores exceeded the 12.00 point interest threshold for chef / head cook and dietician / nutritionist. The mean Total Occupational Interest Scores neared the 12.00 point interest threshold for chef / head cook. Male and female youth expressed similar interest towards lodging manager, but neither group score lodging manager at a Total Occupational Interest Score which exceeded 12.00 points.

Construction industry occupations ranked 4th in interest to youth. The consistently high male mean Total Occupational Interest Scores earned the construction industry the ranking of 4th in overall interest to youth of those in the study. The construction industry mean Total Occupational Interest Score was 10.71 points. Differences are reflected in the male mean Total

Occupational Interest Score of 13.36 points, compared to the female mean Total Occupational Interest Score of 8.38 points. Table 9 illustrates examples of extreme differences in the expressed occupational interest scores of male and female youth towards many construction occupations. The male mean Total Occupational Interest Scores exceeded the 12.00 point interest threshold for carpenter, architect, electrician, and welder, indicating high male interest in the construction industry. Female youth expressed scores of dislike toward most construction industry roles.

Table 9

Total Occupational Interest Scores for Construction Occupations

Occupational Title	Ranking (1 – 60)	Total Score	Sample Mean	Male Mean	Female Mean
Carpenter	20 th	1563	11.17	13.80	8.86
Architect	24 th	1531	11.02	12.92	9.34
Welder / Solder	28 th	1458	10.49	13.55	7.79
Electrician	39 th	1414	10.17	13.17	7.54

As shown in Table 9, male youth expressed some of their highest Total Occupational Interest Scores towards working in the construction industry. The occupation carpenter was one the 2nd highest occupation of interest to male youth, and distinguished as being one of only two non-health care Industry occupations which broke into the top 20 highest interest rankings.

Retail trade industry occupations ranked 5th in overall interest to youth. The retail services industry was ranked 5th in overall interest to youth, with a mean Total Occupational Interest Score of 10.67 points per occupation. The male mean Total Occupational Interest Score was 10.67 points and female mean Total Occupational Interest Score 10.82 points. As shown in

Table 10, while male and female youth recorded similar interest scores towards each occupation, there were no examples of retail trade occupations which received a mean Total Occupational Interest Score exceeding the 12.00 point interest threshold for groups of male or female youth. Chief executive officer mean scores nearly met the 12.00 point interest level for both male and female youth.

Table 10

Total Occupational Interest Scores for Retail Trade Occupations

Occupational Title	Ranking (1 – 60)	Total Score	Sample Mean	Male Mean	Female Mean
Chief Executive	22 nd	1551	11.16	11.08	11.23
Retail Sales Manager	26 th	1470	10.58	10.63	10.53
Administrative Assistant	32 nd	1431	10.29	9.82	10.72

As reflected in Table 10, similar male and female Total Occupational Interest Scores towards several retail trade occupations indicates this industry is becoming more gender neutral.

Geospatial technology industry ranked 6th in overall interest to youth. The geospatial technology industry earned a ranking of 6th in overall interest to youth with a mean Total Occupational Interest Score of 10.55 points per occupation. As shown in Table 11, the male mean Total Occupational Interest Score was 11.81 per occupation. The female mean Total Occupational Interest Score was 9.45 points.

Table 11

Total Occupational Interest Scores for Geospatial Technology Occupations

Occupational Title	Ranking (1 – 60)	Total Score	Sample Mean	Male Mean	Female Mean
Cartographer / Photogrammetrist	19 th	1570	11.29	11.66	10.97
Land Surveyor	51 st	1365	9.82	11.97	7.93

As shown in Table 11, results were mixed towards the expressed occupational interests of male and female youth towards Geospatial Technology industry occupations, with equally high scores for cartographer / photogrammetrist, but lower female interest toward land surveyor.

Financial services industry ranked 7th in overall interest to youth. As shown through Table 12, male and female youth expressed similar interest towards financial services industry occupations, earning the ranking of 7th in overall interest to youth. The mean Total Occupational Interest Score for financial services was 10.28 points per occupation. The male mean Total Occupational Interest Score was 10.03 points. The female mean Total Occupational Interest Score was 10.50 points.

Table 12

Total Occupational Interest Scores for Financial Services Occupations

Occupational Title	Ranking (1 – 60)	Total Score	Sample Mean	Male Mean	Female Mean
Financial Advisor	30 th	1441	10.37	10.34	10.39
Accountant	38 th	1416	10.19	9.71	10.61

As shown in Table 12, though both male and female youth recorded similar interests towards financial services roles, neither group mean Total Occupational Interest Score towards either occupation exceeded the 12.00 point interest threshold.

Biotechnology industry occupations ranked 8th in overall interest to youth. The biotechnology industry was ranked 8th in overall interest to youth with a mean Total Occupational Interest score of 10.17 points per occupation. The biotechnology industry male mean Total Occupational Interest Score was 9.27 per occupation. The female mean Total Occupational Interest Score was 10.93 per occupation.

As shown in Table 13, female youth expressed higher Total Occupational Interest Scores towards working in each of the biotechnology occupations profiled. Given the biotechnology occupations profiled are perceived as being a part on the nation's medical service industries, findings validate earlier indicators of high female and weak male interest toward these roles. As reflected in Table 13, female youth recorded higher mean Total Occupational Interest Scores toward biomedical engineer than were reported by male youth. Biomedical engineer was the only engineering occupation in the study which received higher female interest scores.

Table 13

Total Occupational Interest Scores for Biotechnology Occupations

Occupational Title	Ranking (1 – 60)	Total Score	Sample Mean	Male Mean	Female Mean
Biomedical Engineer	33 rd	1428	10.27	9.25	11.18
Biological Technician	41 st	1402	10.09	9.56	10.46
Chemist	40 th	1411	10.15	9.00	11.16

Higher female interest scores were recorded toward each of the biotechnology occupations in the study, including the chemist, technician, and engineer roles. However, there were no examples of biotechnology occupations which recorded a group mean Total Occupational Interest Score which exceeded the 12.00 point interest threshold.

Transportation industry ranked 9th in overall interest to youth. The transportation industry was ranked 9th in overall interest to youth with a mean Total Occupational Interest Score of 10.01 points per occupation. The male mean Total Occupational Interest Score was 11.85 points; female mean Total Occupational Interest Score was 8.40 points. Male mean Total Occupational Interest Scores towards automobile service mechanic, truck driver, and airline pilot exceeded the 12.00 point threshold. There were no examples of female mean Total Occupational Interest Scores in the transportation industry cluster which exceeded the 12.00 point indicator.

Table 14

Total Occupational Interest Scores for Transportation Occupations

Occupational Title	Ranking (1 – 60)	Total Score	Sample Mean	Male Mean	Female Mean
Automobile Mechanic	23 rd	1548	11.14	14.06	8.57
Airline Pilot	37 th	1417	10.19	12.05	8.57
Logistician	44 th	1390	10.00	9.95	10.04
Truck Driver	53 rd	1347	9.69	12.06	7.60
Railroad Conductor	57 th	1256	9.05	11.11	7.20

The occupation logistician was the only example of a transportation occupation which received slightly a higher female mean Total Occupational Interest Score than male score.

Information technology industry ranked 10th in overall interest to youth. As shown in Table 15, the information technology industry occupations received weak interest scores from both male and female youth, earning the ranking of 10th in interest to youth. The information technology mean Total Occupational Interest Score was 9.99 points per occupation. The male mean Total Occupational Interest Score was 10.76 points. The female mean Total Occupational Interest Score was 9.36 points.

Findings illustrate areas of similarities in the occupational interest scores of male and female youth towards information technology occupations. As shown in Table 15, there were no examples of information technology occupations which received a mean Total Occupational Interest Score greater than 12.00 points from either group of male or female youth.

Table 15

Total Occupational Interest Scores for Information Technology Occupations

Occupational Title	Ranking (1 – 60)	Total Score	Sample Mean	Male Mean	Female Mean
Management Analyst	42 nd	1400	10.07	10.34	9.84
Database Administrator	43 rd	1395	10.04	10.79	9.38
Network Systems Analyst	46 th	1382	9.94	10.85	9.32
Computer Software Engineer	47 th	1379	9.92	11.08	8.91

As shown in Table 15, low occupational interest scores from both male and female youth toward information technology occupations could impact recruitment efforts for many industries.

Advanced manufacturing industry ranked 11th in overall interest to youth. As shown in Table 16, differences were recorded in the mean Total Occupational Interest Scores of male and female youth toward advanced manufacturing Industry occupations. The advanced manufacturing industry was ranked 11th in overall interest to youth with a mean Total Occupational Interest Score of 9.79 points. Extreme differences were reflected through the male mean Total Occupational Interest Score of 11.41 points, in direct contrast to one of the lowest mean Total Occupational Interest Scores from female youth of 8.20 points.

Male youth expressed interest towards robotics technician, as evidenced by the male mean Total Occupational Interest Score which exceeded 12.00 points. The male youth Total Occupational Interest Score neared the 12.00 point threshold toward industrial engineer. However, there were no examples of female mean Total Occupational Interest Scores towards advanced manufacturing occupations which exceeded the 12.00 point interest threshold.

Table 16

Total Occupational Interest Scores for Advanced Manufacturing Occupations

Occupational Title	Ranking (1 – 60)	Total Score	Sample Mean	Male Mean	Female Mean
Industrial Engineer	36 th	1420	10.22	11.65	8.46
Robotics Technician	49 th	1373	9.88	12.69	7.41
Chemical Engineer	56 th	1291	9.29	9.91	8.74

Findings illustrate scores of dislike by female youth towards the advanced manufacturing occupations profiled in the study, while male youth showed interest towards this industry.

Green energy industry ranked 12th in overall interest to youth. As shown in Table 17, the green energy industry earned the distinction of being ranked of least interest to the sample of youth participants, based on this industry cluster of occupations recording the lowest mean Total Occupational Interest Scores from the sample of youth participants. The findings recorded a low mean Total Occupational Interest Score of 9.53 points per occupation. The male mean Total Occupational Interest Score was 10.55 points. The female mean Total Occupational Interest Score was 8.65 points.

Table 17

Total Occupational Interest Scores for Green Energy Occupations

Occupational Title	Ranking (1 – 60)	Total Score	Sample Mean	Male Mean	Female Mean
Wind Energy Engineer	52 nd	1350	9.71	11.62	8.04
Solar Energy Engineer	55 th	1292	9.29	10.72	8.04
Environmental Scientist	58 th	1245	8.95	9.38	8.57
Hydrologist	60 th	1195	8.60	9.34	7.95
HVAC Maintenance	48 th	1379	9.92	11.83	8.24
Green Product Marketer	54 th	1312	9.44	9.83	9.09
Agricultural Farmer	27 th	1467	10.53	11.63	9.59
Regional Planner	50 th	1372	9.87	10.06	9.70

As shown in Table 17, there were no examples of green energy occupations which exceeded the 12.00 point interest threshold in Total Occupational Interest Scores for either group of male or female youth. The male mean Total Occupational Interest Score neared the 12.00 point interest threshold for the occupations of wind energy engineer, HVAC maintenance operations technician, and agricultural technician / farmer occupation. Female interest scores remained low for each of the green energy occupations examined through the study, significantly impacting the prospects of the green energy industry recruiting young females to emerging 21st century roles.

Additional analysis is provided to examine expressed occupational interests of male and female youth toward working in a sample of S.T.E.M. (Science, Technology, Engineering, and Math) focused occupations which were included in the study. For the purposes of analysis, the researcher identified six occupations for each category and purposefully did not include health care occupations in the S.T.E.M. findings to provide a more comprehensive assessment of youth interest in a variety of occupations.

As shown in Table 18, the Total Occupational Interest Scores recorded for both male and female youth toward the mix of S.T.E.M. occupations examined in the study were relatively low. As shown in Table 18, only one occupation exceeding the 12.00 interest threshold for male youth (e.g. robotics technician); and one for female youth (e.g. medical records health information technician) from among the mix of 24 different S.T.E.M. occupations scored in the study.

Table 18

Total Occupational Interest Scores towards S.T.E.M Occupations

S.T.E.M. Occupations	Sample Mean Score (4 – 20 points)	Male (n = 65) Mean Score (4 – 20 points)	Female (n = 74) Mean Score (4 – 20 points)
<u>Science Occupations:</u>			
▪ Biological Technician	10.09	9.56	10.46
▪ Chemist	10.15	9.00	11.16
▪ Hydrologist	8.60	9.34	7.95
▪ Environmental Scientist	8.95	9.38	8.57
▪ Cartographer / Photogrammetrist	11.29	11.66	10.97
▪ Agricultural Tech / Farmer	10.55	11.63	9.89
<u>Technology Occupations:</u>			
▪ Medical Records Technician	11.35	8.91	13.49
▪ Robotics Technician	9.88	12.69	7.41
▪ HVAC Maintenance Operator	9.92	11.83	8.29
▪ Management Analyst	10.07	10.34	9.84
▪ Database Administrator	10.04	10.79	9.38
▪ Network Systems Analyst	9.94	10.85	9.32
<u>Engineering Occupations:</u>			
▪ Chemical Engineer	9.29	9.91	8.74
▪ Industrial Engineer	10.22	11.65	8.46
▪ Computer Software Engineer	9.92	11.08	8.91
▪ Biomedical Engineer	10.27	9.25	11.18
▪ Wind Energy Engineer	9.71	11.62	8.04
▪ Solar Energy Engineer	9.29	10.72	8.04
<u>Mathematics Occupations:</u>			
▪ Accountant	10.19	9.71	10.61
▪ Personal Financial Advisor	10.37	10.34	10.39
▪ Insurance Adjustor / Examiner	9.96	9.85	10.05
▪ Retail Sales Manager	10.58	10.63	10.53
▪ Chief Executive Officer	11.16	11.08	11.23
▪ Land Surveyor	9.82	11.97	7.93

As shown in Table 18, few S.T.E.M. occupations exceeded the 12.00 point interest threshold. Findings reflect patterns of overall higher female interest scores toward each of the science occupations; similar interest scores from male and female youth toward technology and mathematics occupations (with the exception of medical records health information technician and robotics technician); and stronger reports of male interest toward most engineering roles.

In summary, only 11 of the 60 occupations (18%) were scored at levels identified as indicating occupational interest by the group of male youth participants. This finding is based on a finding of 11 occupations which recorded mean Total Occupational Interest Scores for the group of male youth which exceeded the 12.00 point interest threshold through the vocational card sort exercises. Based on these findings, the occupations in the study determined to be of interest to male youth were automobile service mechanic (14.06 points); carpenter (13.80); police detective (13.67); welder / cutter / solder (13.55); security guard (13.32); electrician (13.17); architect (12.92); robotics technician (12.69); municipal firefighter (12.63); truck driver (12.06); and airline pilot (12.05).

Findings report only 18 of the 60 occupations (30%) scored by female youth exceeded the 12.00 point interest threshold. Based on these findings, the occupations determined to be of interest to female youth include physician assistant (14.89); registered nurse (14.74); medical doctor (14.73); radiological technician (13.69); medical records health information technician (13.49); police detective (13.47); physical therapist (13.45); dental hygienist (13.39); counseling psychologist (13.18); pharmacy technician (13.17); social and human services assistant (13.14); chiropractor (13.04); EMT / paramedic (13.00); veterinary technician (13.00); public school teacher (12.87); dietician / nutritionist (12.50); lawyer (12.43); and chef / head cook (12.12). Only the role police detective was scored as being of interest to both male and female youth.

Research Question (2)

To what degree were there significant differences in the degree of occupational interest expressed by male and female youth towards working in each occupation?

Findings for Research Question (2)

Findings for this research question examined significant differences found when comparing mean Total Occupational Interest Scores of groups of male and female youth toward each occupation. As shown in Table 19 and Table 20, findings report extreme differences in the type of occupations which were scored as being of most interest to male and female youth.

Top occupational interests of female youth participants. As shown in Table 19, the top five highest scoring occupations of female youth were each found in the health care industry: (1st) physician assistant, (2nd) registered nurse, (3rd) medical doctor, (4th) radiological technician, and (5th) medical records health information technician.

Table 19

Top 5 Occupational Interest Scores Reported by Female Youth Participants (n = 74)

		Physician Assistant (1 st)	Registered Nurse (2 nd)	Medical Doctor (3 rd)	Radiological Tech (4 th)	Medical Records Tech (5 th)
Female	Mean	14.89	14.74	14.73	13.69	13.49
	n	74	74	74	74	74
	Std. Deviation	3.999	4.041	3.422	4.164	3.563
	Median	13.00	12.00	13.00	11.00	11.00

Table 19 illustrates female youth consistently expressed highest Total Occupational Interest Scores toward working in each of the health care occupations examined in the study.

However this single industry focus on health care appears to be restricting the range of occupations female youth are scoring to be of interest in the 21st century workplace.

Top occupational interests of male youth participants. As shown in Table 20, male youth expressed their highest interest towards working in a wider variety of occupations, which are each occupations considered to be traditionally performed by male workers. Those occupations of most interest to male youth were automobile service mechanic (1st), carpenter (2nd), and police detective (3rd). No health care roles were scored to be of interest to male youth.

Table 20

Top 5 Occupations of Interest Scores Reported by Male Youth Participants (n = 65)

		Auto Mechanic (1 st)	Carpenter (2 nd)	Police Detective (3 rd)	Welder / Cutter (4 th)	Security Guard (5 th)
Sex	Mean	14.06	13.80	13.63	13.55	13.32
Male	N	65	65	65	65	65
	Std. Deviation	5.089	4.508	4.612	4.905	4.035
	Median	11.00	11.00	14.00	10.00	12.00

Findings suggest male youth expressed higher interest towards working in a wider range of occupations across more industries than were shown to be of interest to female youth.

Examining Differences in Occupational Interest by Gender

To address the research question, SPSS 19.0 statistical analysis techniques examined the significance of differences expressed in the Total Occupational Interest Scores of male and female youth towards each occupation. Results shown in Table 21 and Table 22 illustrate the

significance of findings resulting from a series of Independent T-Tests performed to compare differences in the group mean Total Occupational Interest Scores of male and female youth.

Findings deemed to be significant met a stringent Family Wise Error Rate alpha .00083*.

Table 21 and Table 22 show significant differences in the occupational interests of youth.

Table 21

T-Test Analysis of Occupations With Significantly Higher Scores from Male Youth

Occupation Title	Sample Mean	Male Mean	Female Mean	Mean Difference	T-Test sig (.000833)*
HVAC Operations Tech.	9.92	11.83	8.24	3.588	t (6.891), df 137, sig .000*
Robotic Technician	9.88	12.69	7.41	5.287	t (9.515), df 137, sig. 000*
Automobile Mechanic	11.14	14.06	8.57	5.494	t (7.172), df 137, sig. 000*
Architect	11.02	12.92	9.34	3.582	t (5.653), df 137, sig. 000*
Wind Energy Engineer	9.71	11.62	8.04	3.575	t (6.211), df 137, sig. 000*
Solar Energy Engineer	9.29	10.72	8.04	2.683	t (5.400), df 137, sig. 000*
Electrician	10.17	13.17	7.54	5.632	t (8.845), df 137, sig. 000*
Carpenter	11.17	13.80	8.86	4.935	t (7.200), df 137, sig. 000*
Railroad Conductor	9.03	11.11	7.21	3.895	t (6.830), df 137, sig. 000*
Land Surveyor	9.82	11.97	7.93	4.037	t (7.318), df 137, sig. 000*
Municipal Firefighter	11.01	12.63	9.58	3.050	t (4.141), df 137, sig. 000*
Welder / Solder / Brazer	10.49	13.55	7.79	5.760	t (7.91), df 137, sig. 000*
Industrial Engineer	10.22	11.65	8.46	2.687	t (5.332), df 137, sig. 000*
Truck Driver	9.69	12.06	7.61	4.486	t (6.553), df 137, sig. 000*
Security Guard	11.71	13.32	10.29	3.036	t (4.377), df 137, sig. 000*
Airline Pilot	10.19	12.05	8.57	3.479	t (4.818), df 137, sig. 000*

As shown in Table 21, male youth are most interested in performing traditional male occupations in the 21st century workplace. Examination of interest scores toward working in female sex-typed occupations also revealed a pattern of significantly higher interest scores from female youth toward performing these roles.

As illustrated in Table 22, female youth reported significantly higher interest towards working in 14 of the 16 health care occupations which were examined in the study.

Table 22

T-Test Analysis of Occupations with Significantly Higher Scores from Female Youth

Physician Assistant	12.58	9.94	14.89	4.953	t (-7.83), df 137, sig. 000*
Social and Human Services	12.02	10.73	13.14	2.381	t (-4.603), df 137, sig. 000*
Chemist	10.15	9.00	11.16	2.162	t (-3.956), df 137, sig. .000*
Medical Records Info Tech	11.35	8.91	13.49	4.579	t (-8.029), df 137, sig. 000*
Chiropractor	11.40	9.54	13.04	3.502	t (-6.941), df 137, sig. 000*
Radiological Technician	11.90	9.86	13.69	3.828	t (-5.719), df 137, sig. 000*
Physical Therapist	12.42	11.26	13.45	2.184	t (-3.946), df 137, sig. 000*
Medical Doctor	12.56	10.09	14.73	4.637	t (-7.799), df 137, sig. 000*
EMT / Paramedic	11.48	9.74	13.01	3.235	t (-4.839), df 137, sig. 000*
Dental Hygienist	11.20	8.71	13.39	4.684	t (-6.640), df 137, sig. 000*
Counseling Psychologist	12.14	10.95	13.18	2.222	t (-4.134), df 137, sig. .000*
Registered Nurse	12.18	9.26	14.74	5.482	t (-8.617), df 137, sig. 000*
Pharmacy Technician	11.43	9.46	13.17	3.708	t (-6.388), df 137, sig. 000*
Biomedical Engineer	10.27	9.25	11.18	1.930	t (-3.647), df 137, sig. 000*
Dietician or Nutritionist	11.32	9.97	12.50	2.531	t (-4.475), df 137, sig. 000*
Lawyer	11.40	10.23	12.43	2.202	t (-3.683), df 137, sig. 000*

In summary, Table 21 and Table 22 illustrate findings of significantly higher Total Occupational Interest Scores recorded by both male and female youth towards working in the majority of traditional occupations each gender most often performs in the workplace today.

As shown in Table 21, a total of 16 of the 60 occupations (26%) were scored to be of significantly higher interest to male youth. Similarly, Table 22, also identifies 16 occupations of the 60 occupations examined scored to be of significantly higher interest to female youth.

As shown in Table 23, the study found relatively few differences in the interest scores of male and female youth toward working in the S.T.E.M. occupations included in the study, except when the occupation was from the health care industry or the green energy industry, which recorded significant differences in interest from the male and female youth participants.

Table 23

T-Test Comparison of Male and Female Youth Interest In S.T.E.M Occupations (sig. 00083)*

S.T.E.M. Occupations	Male Mean	Female Mean	T-Test Results
▪ Chemist	9.00	11.16	t(-3.956), df 137, sig.000*
▪ Medical Records Technician	8.91	13.49	t(-8.029), df 137, sig .000*
▪ Robotics Technician	12.69	7.40	t(9.515), df 137, sig .000*
▪ HVAC Maintenance Operator	11.83	8.24	t(6.891), df 137, sig .000*
▪ Industrial Engineer	11.65	8.46	t(5.335), df 137, sig .000*
▪ Biomedical Engineer	9.25	11.18	t(-3.697), df 137, sig .000*
▪ Wind Energy Engineer	11.62	8.04	t(6.211), df 137, sig .000*
▪ Solar Energy Engineer	10.72	8.04	t(5.400), df 137, sig .000*
▪ Land Surveyor	11.97	7.95	t(7.318), df 137, sig .000

Research Question (3)

To what degree does the proportion of male and female youth expressing interest in working in “sex-typed” occupations for their gender to perform significantly differ?

Findings for Research Question (3)

To answer this research question, SPSS 19.0 examined proportional differences in the distribution of vocational card sort scores (1 – 5) by male and female youth through the vocational card sort exercises. Statistical analysis also examined proportional differences in the recorded Total Occupational Interest Scores (4 - 20 points) of male and female youth toward each occupation using Pearson Chi-Square, Crosstabs, and Mann Whitney U tests.

A series of tables are presented in the following section to illustrate examples of proportional differences in the vocational card sort scores of male and female youth toward working in a variety of traditional, non-traditional, gender neutral, and new and emerging green energy occupations examined in the study. Findings in Table 24 and Table 25 present proportional differences in the scores of male and female youth toward those occupations considered to be sex-typed occupations for one gender or the other to perform in the workplace. Table 26 and Table 27 illustrate similar proportions of male and female youth scores toward police detective, which is a male sex-typed occupation, but the highest scoring occupation in the study. Table 28 and Table 29 illustrate significant differences in the proportion of youth interested in the male-sex typed occupation automobile service mechanic. Table 30 - Table 33 illustrate significant differences in proportion of youth interested in the female sex-typed occupations registered nurse and executive administrative assistant. Table 34 - Table 40 illustrate differences in the proportion of male and female youth interested in the gender neutral occupations physician assistant, cartographer / photogrammetrist, and chief executive officer.

Occupations labeled as “sex-typed” for each gender were those identified by the U.S. Department of Labor as having a workforce comprised of 75% of workers performing the role being either a male or female. Sources used to identify “sex-typed” occupations included in the study were the U.S. Department of Labor *Occupational Profile* reports (2008); *Nontraditional Occupations for Women* (2009) and the report *Nontraditional Occupations for Men* (2009).

Findings in Table 24 indicate higher proportions of male youth expressed interest in working in 15 of the 25 male sex-typed occupations examined in the study.

Table 24

Male Sex Typed Occupations – Pearson’ Chi-Square Test Results (sig .00083)*

<u>Male Sex-Typed Role</u>	<u>% Female</u>	<u>MM</u>	<u>FM</u>	<u>Value</u>	<u>DF</u>	<u>sig.</u>	<u>U test</u>
Architect	< 24.8% female	12.92	9.34	38.796	17	..002	..000*
Robotics Technician	< 18.5% female	12.69	7.41	64.281	17	.000*	.000*
Automobile Service Mechanic	< 1.6% female	14.06	8.57	48.441	17	.000*	.000*
Electrician	< 1.0% female	13.17	7.54	59.863	17	.000*	.000*
Carpenter	< 1.5% female	13.80	8.86	43.762	17	.000*	.000*
Railroad Conductor Yardmaster	< 4.7% female	11.11	7.21	42.054	17	.000*	.000*
Welder /Cutter / Solder / Brazer	< 4.7% female	13.55	7.79	55.306	17	.000*	.000*
HVAC Operations Maintenance I	< 7.5% female	11.83	8.24	42.897	17	.000*	.000*
Hazardous Materials Removal	< 3.5% female	9.71	8.00	20.227	17	.000	.000*
Land Surveyor	< 4.9% female	11.97	7.93	44.167	17	.000*	.000*
Airline Pilot	< 2.6% female	12.05	8.57	29.202	17	.023	.000*
Municipal Firefighter	< 4.8% female	12.68	9.58	30.815	17	.014	.000*
Industrial Engineer	< 14.9% female	11.65	8.46	30.376	17	.007	.000*
Truck Driver	< 4.9% female	12.06	7.61	44.052	17	.000*	.000*
Security Guard	< 23.6% female	13.32	10.29	31.029		.001	.000*

As shown in Table 24, the 15 male sex-typed occupations which recorded a significantly larger proportion of male youth interested in the occupation were from the construction, advanced manufacturing, transportation and automotive services, and homeland security

industries. Findings report a significantly higher proportion of female youth expressed interest in working in the male sex-typed occupation chiropractor in the study.

As shown in Table 25, only 8 of the 15 female sex-typed occupations recorded significant differences in the proportion of male and female youth who expressed interest in performing the occupation, indicating some female sex-typed occupations are also gaining male interest.

Table 25

Female Sex Typed Occupations –Chi-Square Goodness of Fit Test Results (sig .00083)*

Female Sex-Typed Occupations	% Male Workers	Male Mean	Female Mean	Value	Df	Asymp. Sig. (2-sided)	Mann Whitney U Test
Social / Human Services Assistant	<20.6%	10.73	13.14	24.158	17	.062	.000*
Medical Records Technician	<5.00%	8.91	13.49	56.148	17	.000*	.000*
Radiological Technician	<24.9%	9.86	13.69	37.201	17	.001	.000*
Physical Therapist	<23.3%	11.26	13.45	22.571	17	.094	.000*
Dental Hygienist	<2.3%	8.71	13.39	46.089	17	.000*	.000*
Registered Nurse	<8.31%	9.26	14.74	62.401	17	.000*	.000*
Dietician or Nutritionist	<10.00%	9.97	12.50	25.303	17	.046	.000*
Speech Language Pathologist	<1.96%	9.08	11.32	29.849	17	.008	.000*

As shown in Table 25, higher proportions of female youth than male youth consistently expressed interest towards working in the health care occupations examined in the study. Each of the female sex-typed occupations which found significantly higher proportions of female youth interested in the occupation were from the health care industry.

However, 7 of the 15 female sex-typed occupations did not record significantly higher proportions of female youth expressing interest than did male youth. Those female sex-typed occupations which found similar proportions of male and female youth interested were biological

technician, veterinary technician, retail sales manager, insurance examiner, executive administrative assistant, and personal home health aide. Similarly, the 10 male sex-typed occupations which found similar proportions of female interest were network systems data analyst, computer software engineer, chef / head cook, police detective, database administrator, chemical engineer, biomedical engineer, agricultural technician / farmer, and logistician.

The finding of similar proportions of male and female youth expressing interest in working in some of the sex-typed occupations examined in the study validates prior research assumptions that some sex-typed occupations are becoming perceived as more gender neutral.

A series of tables of the frequency distribution of vocational card sort scores for the sample 65 male and 74 female youth illustrate examples of surprising similarities and extreme differences in the expressed occupational interests of youth. The findings present comparative data on male and female interest scores for a selection of 25 male sex-typed occupations, 15 female sex-typed occupations, 14 gender neutral, and 6 new and emerging occupations. Tables depict differences in the overall proportion of male and female youth who expressed interest in working in each occupation, based on the placement of the vocational cards used in the study.

A complete set of tables illustrating the frequency distribution of vocational card sort scores for each deck (A+B+C+D) of vocational card results for each occupation are included in Appendix D. These tables are provided for further examination of the scores recorded by youth toward each of the different occupational characteristics for each role, and to recognize the similarities or differences in occupational interests of youth considering 21st century occupations.

Examining Gender-Based Differences Using Frequency Distribution Tables

To illustrate proportional differences in the percentage of male and female youth expressing interest in each occupation, frequency distribution tables are in Appendix D.

As shown in Table 26 and Table 27, the study did not find significant differences in the proportion of male and female youth who expressed interest in performing the male sex-typed occupation police detective, based on results of Pearson Chi-Square statistical analysis tests.

Table 26

Frequency Table Series (A+B+C+D) for Police Detective (sig. 00083)*

Police Detective Deck A	5	4	3	2	1	
Tasks	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	13 (20%)	20 (31%)	11 (17%)	13 (20%)	8 (12%)	65
Female	18 (24%)	24 (32%)	15 (20%)	11 (15%)	6 (8%)	74
Total / %	31 (20%)	44 (32%)	26 (19%)	24 (17%)	14 (10%)	139
(Chi-square value 1.662, df 4, sig .798)						
Police Detective Deck B	5	4	3	2	1	
Workplace	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	15 (23%)	21 (32%)	11 (17%)	9 (14%)	9 (14%)	65
Female	22 (30%)	23 (31%)	14 (19%)	9 (12%)	6 (8%)	74
Total / %	37 (27%)	44 (32%)	25 (18%)	18 (13%)	15 (11%)	139
(Chi-square value 1.800, df 4, sig .772)						
Police Detective Deck C	5	4	3	2	1	
Title	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	12 (19%)	25 (39%)	15 (23%)	6 (9%)	7 (11%)	65
Female	14 (19%)	21 (28%)	17 (23%)	14 (19%)	8 (11%)	74
Total / %	26 (19%)	46 (33%)	32 (23%)	20 (14%)	15 (11%)	139
(Chi-square value 3.325, df 4, sig .505)						
Police Detective Deck D	5	4	3	2	1	
Tools	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	21 (32%)	17 (26%)	12 (19%)	6 (9%)	9 (14%)	65
Female	16 (22%)	17 (23%)	13 (17%)	15 (20%)	13 (18%)	74
Total / %	37 (27%)	34 (25%)	25 (18%)	21 (15%)	22 (16%)	139
(Chi-square value 4.737, df 4, sig .315)						

Table 27 illustrates similar Total Occupational Interest Scores for police detective recorded for both male and female youth. The findings of high proportions of both male and female youth interested in the occupation police detective is one example of a sex-typed occupation becoming gender neutral. Police detective was the highest ranked role in the study.

Table 27

Total Occupational Interest Scores For Police Detective (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
20	20	9 (14%)	11 (15%)	14%
19	4	2 (3%)	2 (3%)	3%
18	5	1 (1%)	4 (5%)	4%
17	12	8 (12%)	4 (5%)	9%
Some Interest (Pile 4 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
16	11	6 (9%)	5 (7%)	8%
15	14	8 (12%)	6 (8%)	10%
14	6	3 (5%)	3 (4%)	4%
13	8	2 (3%)	6 (8%)	6%
No Interest (Pile 3 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
12	14	6 (9%)	8 (11%)	10%
11	12	4 (6%)	8 (11%)	9%
10	6	3 (5%)	3 (4%)	6 (4%)
9	6	2 (3%)	4 (5%)	6 (4%)
Some Dislike (Pile 2 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
8	2	1 (1%)	1 (1%)	1%
7	4	2 (3%)	2 (3%)	3%
6	8	5 (8%)	3 (4%)	6%
5	5	2 (3%)	3 (4%)	4%
Strong Dislike (Pile 1 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
4	2	1 (1%)	1 (1%)	1%

Pearson Chi-Square value 8.145, df 16, asymp. sig. (2-sided) .944

However, Table 28 clearly shows much weaker female interest toward the male sex-typed occupation automobile services mechanic, the highest ranked occupation by male youth.

Table 28

Frequency Table Series (A+B+C+D) for Automobile Service Mechanic (sig. 00083)*

Auto Mechanic	5	4	3	2	1	
Deck A Tasks	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	23 (35%)	14 (22%)	5 (8%)	15 (23%)	8 (12%)	65
Female	3 (4%)	8 (11%)	18 (24%)	19 (26%)	26 (35%)	74
Total / %	26 (19%)	22 (16%)	23 (16%)	34 (25%)	34 (25%)	139
Chi-square value 33.928, df 4, sig. 000*						
Auto Mechanic	5	4	3	2	1	
Deck B Workplace	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	24 (37%)	16 (25%)	9 (14%)	7 (11%)	9 (14%)	65
Female	2 (3%)	13 (18%)	12 (16%)	16 (22%)	31 (42%)	74
Total / %	26 (19%)	29 (21%)	21 (15%)	23 (16%)	40 (29%)	139
Chi-square value 33.538, df 4, sig. 000*						
Auto Mechanic	5	4	3	2	1	
Deck C Title	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	25 (39%)	12 (19%)	14 (22%)	9 (14%)	5 (8%)	65
Female	2 (3%)	7 (10%)	15 (20%)	19 (25%)	31 (42%)	74
Total / %	27 (19%)	19 (14%)	29 (21%)	28 (20%)	36 (26%)	139
Chi-square value 42.889, df 4, sig. 000*						
Auto Mechanic	5	4	3	2	1	
Deck D Tools	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	19 (29%)	18 (28%)	6 (9%)	11 (17%)	11 (17%)	65
Female	2 (3%)	9 (12%)	15 (20%)	17 (23%)	31 (42%)	74
Total / %	21 (15%)	27 (19%)	21 (15%)	28 (20%)	42 (30%)	139
Chi-square value 30.976, df 4, sig. 000*						

As is shown in Table 28, male and female youth expressed significantly different ranges of Total Occupational Interest Scores in each of the four card sort scores. Table 29 illustrates areas of significant difference in the proportion of male and female youth who expressed high interest scores towards working as an automobile service mechanic.

Table 29

Total Occupational Interest Scores for Automobile Service Mechanic (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
20	15	15 (23%)	0	11%
19	4	3 (5%)	1 (1.4%)	3%
18	3	3 (5%)	0	2%
17	7	4 (6%)	3 (4%)	5%
Some Interest (Pile 4 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
16	8	7 (11%)	1 (1%)	6%
15	3	2 (3%)	1 (1%)	2%
14	8	5 (8%)	3 (4%)	6%
13	3	1(1%)	2 (3%)	2%
No Interest (Pile 3 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
12	9	4 (6%)	5 (7%)	7%
11	10	2 (3%)	8 (11%)	7%
10	7	3(4%)	4 (5%)	5%
9	9	2 (3%)	7 (9%)	7%
Some Dislike (Pile 2 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
8	11	5 (8%)	6 (8%)	8%
7	8	2 (3%)	6 (8%)	6%
6	10	4 (6%)	6 (8%)	7%
5	6	2 (3%)	4 (5%)	4%
Strong Dislike (Pile 1 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
4	18	1 (1%)	17 (23%)	13%

Pearson Chi Square Value 48.441, df 4, sig.000*

As shown through this example, female youth did not express interest toward performing the male sex-typed occupation automobile services mechanic in this study.

Likewise, Table 30 illustrates an example of significant and extreme differences in the proportion of male and youth interested in the female sex-typed occupation registered nurse.

Table 30

Frequency Table Series (A+B+C+D) for Registered Nurse (sig. 00083)*

Registered Nurse	5	4	3	2	1	
Deck A	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	3 (5%)	3 (5%)	20 (31%)	24 (37%)	15 (23%)	65
Female	22 (30%)	26 (35%)	12 (16%)	7 (10%)	7 (10%)	74
Total / %	25 (18%)	29 (21%)	32 (23%)	31 (22%)	22 (16%)	139
Chi-square value 46.525, df 4, sig. 000*						
Registered Nurse	5	4	3	2	1	
Deck B	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	5 (8%)	9 (14%)	13 (20%)	19 (29%)	19 (29%)	65
Female	35 (47%)	24 (32%)	6 (8%)	4 (5%)	5 (7%)	74
Total / %	40 (29%)	33 (24%)	19 (14%)	23 (16%)	24 (17%)	139
Chi-square value 49.471, df 4, sig. 000*						
Registered Nurse	5	4	3	2	1	
Deck C	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	1 (1%)	8 (12%)	17 (26%)	24 (37%)	15 (23%)	65
Female	29 (39%)	24 (32%)	8 (11%)	5 (7%)	8 (11%)	74
Total / %	30 (22%)	32 (23%)	25 (18%)	29 (21%)	23 (17%)	139
Chi-square value 51.586, df 4, sig. 000*						
Registered Nurse	5	4	3	2	1	
Deck D	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	1 (1%)	6 (9%)	22 (34%)	12 (18%)	24 (37%)	65
Female	13 (17%)	23 (31%)	16 (22%)	8 (11%)	14 (19%)	74
Total / %	14 (10%)	29 (21%)	38 (27%)	20 (14%)	38 (27%)	139
Chi-square value 24.149, df 4, sig. 000*						

As is shown in Table 30, male and female youth expressed significantly different interest towards each aspect of performing the female sex-typed occupation registered nurse.

Table 31 illustrates areas of significant difference in the proportion of male and female youth who expressed strong interest and dislike towards the occupation registered nurse.

Table 31

Total Occupational Interest Scores for Registered Nurse (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
20	7	0	7 (10%)	5%
19	8	1 (1%)	7 (10%)	6%
18	7	1 (1%)	6 (8%)	5%
17	11	2 (3%)	9 (12%)	8%
Some Interest (Pile 4 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
16	9	0	9 (12%)	7%
15	7	1 (1%)	6 (8%)	5%
14	7	2 (3%)	5 (7%)	5%
13	9	2 (3%)	7 (10%)	6%
No Interest (Pile 3 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
12	9	5 (8%)	4 (5%)	7%
11	7	4 (6%)	3 (4%)	5%
10	12	9 (14%)	3 (4%)	9%
9	8	7 (11%)	1 (1%)	6%
Some Dislike (Pile 2 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
8	13	12 (19%)	1 (1%)	9%
7	8	5 (8%)	3 (4%)	6%
6	7	7 (11%)	0	5%
5	5	4 (6%)	1 (1%)	4%
Strong Dislike (Pile 1 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
4	5	3 (5%)	2 (3%)	3.6%

(Chi-square value 62.401, df 16, sig .000*)

The study did not report significant proportional differences in male and female interest toward the female sex-typed occupations executive administrative assistant, veterinary technologist, personal home health aide, school teacher, retail sales manager, biological technician, and insurance examiner roles, as illustrated in Table 32 toward executive assistant.

Table 32

Frequency Table Series (A+B+C+D) for Executive Administrative Assistant (sig. 00083)*

Executive Assistant	5	4	3	2	1	
Deck A	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	1 (1%)	4 (6%)	16 (25%)	30 (46%)	14 (22%)	65
Female	4 (5%)	14 (19%)	19 (24%)	23 (31%)	14 (19%)	74
Total / %	5 (4%)	18 (13%)	35 (25%)	53 (28%)	28 (20%)	139
Chi-square value 7.988, df 4, sig. 092;						
Executive Assistant	5	4	3	2	1	
Deck B	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	2 (3%)	5 (8%)	19 (29%)	24 (37%)	15 (23%)	65
Female	3 (4%)	12 (16%)	27 (36%)	23 (31%)	9 (12%)	74
Total / %	5 (4%)	17 (12%)	46 (33%)	47 (34%)	24 (17%)	139
Chi-square value 5.435, df 4, sig. 246						
Executive Assistant	5	4	3	2	1	
Deck C	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	2 (3%)	7 (11%)	25 (39%)	21 (32%)	10 (15%)	65
Female	4 (5%)	14 (19%)	23 (31%)	18 (24%)	14 (19%)	74
Total / %	6 (4%)	21 (15%)	48 (34%)	39 (28%)	24 (17%)	139
Chi-square value 4.417, df 4, sig. .491						
Executive Assistant	5	4	3	2	1	
Deck D	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	7 (11%)	9 (14%)	20 (31%)	20 (31%)	9 (14%)	65
Female	8 (11%)	13 (18%)	23 (31%)	19 (26%)	11 (15%)	74
Total / %	15 (11%)	22 (16%)	43 (31%)	39 (28%)	20 (14%)	139
Chi-square value .649, df 4, sig. .957						

As is shown in Table 32 and Table 33, male and female youth expressed similar interest towards performing a variety of elements of the executive administrative assistant role. Findings in Table 33 suggest the occupation executive administrative assistant is becoming gender neutral.

Table 33

Total Occupational Interest Scores for Executive Administrative Assistant (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
20	0	0	0	0
19	2	1 (1%)	1 (1%)	1%
18	2	0	2 (2%)	1%
17	2	0	2 (2%)	1%
Some Interest (Pile 4 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
16	3	1 (1%)	2 (2%)	2%
15	6	2 (3%)	4 (5%)	4%
14	6	2 (3%)	4 (5%)	4%
13	7	2 (3%)	5 (7%)	5%
No Interest (Pile 3 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
12	19	8 (12%)	11 (15%)	14%
11	19	9 (14%)	10 (14%)	14%
10	20	13 (20%)	7 (10%)	14%
9	15	6 (9%)	9 (12%)	11%
Some Dislike (Pile 2 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
8	18	11 (17%)	7 (10%)	13%
7	11	4 (6%)	7 (10%)	8%
6	5	4 (6%)	1 (1%)	4%
5	4	2 (3%)	2 (3%)	3%
Strong Dislike (Pile 1 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
4	3	1 (%)	2 (3%)	2%

Chi-square value 13.526, df 16, sig .634

Similar Interests Scores Recorded for Gender Neutral Occupations

To further examine the impact of gender on the expressed occupational interests of youth, the study included 14 occupations considered to be gender neutral in today's workplace. SPSS 19.0 statistical analysis software performed Pearson's Chi Square, Crosstabs, and Mann Whitney U tests to examine the significance of differences in the proportion of male and female youth who expressed interest towards working the mix of gender-neutral occupations in the study.

As shown in Table 34, when the gender neutral occupation was from the health care industry, significantly higher proportions of female youth reported interest than did male youth. The study found seven of the 14 gender neutral occupations which recorded significantly higher proportions of female interest than male interest: physician assistant, medical doctor, EMT / paramedic, chemist, pharmacy technician, lawyer, and counseling psychologist.

However, there were no examples of higher proportions of male youth who expressed interest toward any of the gender neutral occupations examined in the study, regardless of industry. The gender neutral occupations which did not find significant differences in the proportion of male and female youth interested in performing the occupations were chief executive officer, coroner, lodging manager, accountant, cartographer / photogrammetrist, personal financial advisor, and management analyst.

Findings illustrate more female congruence with occupations in the financial services industry. Findings also point to significant differences reported in the proportion of male and female youth who expressed interest in working in occupations considered to be a part of the nation's health, emergency response, and medical service fields. Higher proportions of female youth expressed high interest scores toward each of the health care occupations in the study.

As shown through Table 34, even occupations which are commonly performed by male workers in the health care industry, including coroner, EMT / paramedic, chief executive officer, lawyer, and medical doctor, recorded significantly higher proportions of female youth interest.

Table 34

Gender Neutral Occupations –Chi-Square Goodness of Fit Test Results (sig .00083)*

Gender Neutral Occupations	Male Mean	Female Mean	Value	df	Asymp. Sig. (2-sided)	Mann Whitney U Test
Physician Assistant	9.94	14.89	63.459	17	.000*	.000*
Chief Executive Officer	11.08	11.23	12.386	15	.575	.845
Coroner	9.77	10.85	11.017	15	.777	.168
Medical Doctor	10.09	14.73	48.442	15	.000*	.000*
Cartographer or Photogrammetrist	11.66	10.97	15.408	17	.566	.198
EMT / Paramedic	9.74	13.01	29.922	17	.027	.000*
Personal Financial Advisor	10.34	10.39	4.574	17	.995	.924
Lodging Manager	10.23	10.20	4.580	17	.991	.997
Chemist	9.00	11.16	26.615	17	.032	.000*
Pharmacy Technician	9.46	13.17	42.966	17	.001	.000*
Accountant	9.71	10.61	12.414	17	.715	.067
Management Analyst	10.34	9.84	29.013	17	.024	.110
Lawyer	10.23	12.43	28.295	17	.029	.000*
Counseling Psychologist	10.95	13.18	26.207	17	.036	.000*

As shown through Table 34, each gender neutral occupation which recorded significantly higher proportions of female youth interested in the occupation when compared to male youth interest were occupations found in the health care industry. This finding validated a consistent pattern of male youth expressing consistently low interest scores toward the health care occupations examined in the study. Significantly lower proportions of male youth expressed interest in performing occupations found in the health care industry compared to female youth.

As shown in Table 35 and Table 36, higher proportions of female youth expressed interest in the gender neutral occupation physician assistant, which also received the highest Total Occupational Interest Score ranking for overall female youth interest scores in the study.

Table 35

Frequency Table Series (A+B+C+D) for Physician Assistant (sig. 00083)*

Physician Assistant	5	4	3	2	1	
Deck A	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	5 (8%)	12 (19%)	16 (25%)	19 (30%)	13 (20%)	65
Female	20 (27%)	27 (37%)	13 (18%)	9 (12%)	5 (7%)	74
Total / %	25 (18%)	39 (28%)	29 (21%)	28 (21%)	18 (13%)	139
(Chi-square value 21.715, df 4, sig .000*)						
Physician Assistant	5	4	3	2	1	
Deck B	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	3 (5%)	12 (19%)	16 (25%)	16 (25%)	18 (28%)	65
Female	35 (47%)	21 (28%)	10 (14%)	4 (5%)	4 (5%)	74
Total / %	38 (27%)	33 (24%)	26 (19%)	20 (14%)	22 (16%)	139
(Chi-square value 46/508, df 4, sig .000*)						
Physician Assistant	5	4	3	2	1	
Deck C	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	1 (1%)	9 (14%)	20 (31%)	27 (42%)	8 (12%)	65
Female	27 (30%)	30 (41%)	14 (19%)	7 (10%)	1 (1%)	74
Total / %	28 (17%)	39 (28%)	34 (25%)	34 (25%)	9 (6%)	139
(Chi-square value 48.370, df 4, sig .000*)						
Physician Assistant	5	4	3	2	1	
Deck D	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	2 (3%)	7 (11%)	16 (25%)	26 (40%)	14 (22%)	65
Female	15 (20%)	33 (45%)	11 (15%)	8 (11%)	7 (10%)	74
Total / %	17 (12%)	40 (29%)	27 (19%)	34 (24%)	21 (15%)	139
(Chi-square value 39.212, df 4, sig .000*)						

As is shown in Table 35, male and female youth expressed significantly different interest towards performing each element of the role physician assistant in the study.

Table 36 illustrates areas of significant difference in the proportion of male and female youth who expressed interest versus dislike toward the role physician assistant.

Table 36

Total Occupational Interest Scores for Physician Assistant (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
20	8	0	8 (11%)	6%
19	7	1 (1%)	6 (8%)	5%
18	5	0	5 (7%)	4%
17	10	2 (3%)	8 (11%)	7%
Some Interest (Pile 4 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
16	12	1 (1%)	11 (15%)	9%
15	12	2 (3%)	10 (14%)	9%
14	11	4 (6%)	7 (9%)	8%
13	8	6 (9%)	2 (3%)	6%
No Interest (Pile 3 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
12	8	4 (6%)	4 (5%)	6%
11	11	9 (13%)	2 (3%)	8%
10	6	2 (3%)	4 (5%)	4%
9	11	10 (15%)	1 (1%)	8%
Some Dislike (Pile 2 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
8	9	8 (12%)	1 (1%)	7%
7	7	6 (4%)	1 (1%)	5%
6	7	5 (7%)	2 (3%)	5%
5	3	3 (5%)	0	2%
Strong Dislike (Pile 1 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
4	4	2 (3%)	2 (3%)	3%

Chi-square value 63.459, df 17, asymp. sig (2-sided) .000*

Table 37 illustrates higher scores of dislike than interest by male and female youth towards many aspects of the gender neutral occupation cartographer / photogrammetrist.

Table 37

Frequency Table Series (A+B+C+D) for Cartographer / Photogrammetrist (sig. 00083)*

Cartographer	5	4	3	2	1	
Deck A	Strong	Some	No		Strong	Total
Tasks	Interest	Interest	Interest	Dislike	Dislike	Selections
Male	5 (8%)	9 (14%)	24 (37%)	21 (32%)	6 (9%)	65
Female	3 (4%)	5 (7%)	18 (29%)	25 (34%)	23 (31%)	74
Total / %	8 (6%)	14 (10%)	42 (31%)	46 (33%)	29 (21%)	139
(Chi-square value 12.282, df 4, sig .015)						
Cartographer	5	4	3	2	1	
Deck B	Strong	Some	No		Strong	Total
Workplace	Interest	Interest	Interest	Dislike	Dislike	Selections
Male	7 (11%)	22 (34%)	14 (22%)	15 (23%)	7 (11%)	65
Female	8 (11%)	19 (26%)	19 (26%)	19 (26%)	8 (11%)	74
Total / %	15 (11%)	41 (30%)	33 (24%)	34 (25%)	15 (11%)	139
(Chi-square value 1.121, df 4, sig .891)						
Cartographer	5	4	3	2	1	
Deck C	Strong	Some	No		Strong	Total
Title	Interest	Interest	Interest	Dislike	Dislike	Selections
Male	4 (6%)	10 (15%)	21 (32%)	18 (28%)	12 (19%)	65
Female	2 (3%)	12 (16%)	29 (39%)	22 (30%)	9 (12%)	74
Total / %	6 (4%)	22 (16%)	50 (36%)	40 (29%)	21 (15%)	139
(Chi-square value 2.384, df 4, sig .665)						
Cartographer	5	4	3	2	1	
Deck D	Strong	Some	No		Strong	Total
Tools	Interest	Interest	Interest	Dislike	Dislike	Selections
Male	11 (17%)	18 (28%)	13 (20%)	15 (23%)	8 (12%)	65
Female	13 (18%)	21 (28%)	20 (27%)	12 (16%)	8 (11%)	74
Total / %	24 (17%)	39 (28%)	33 (23%)	27 (19%)	16 (12%)	139
(Chi-square value 1.640, df 4, sig .802)						

Table 37 and Table 38 illustrate striking similarities in male and female youth vocational card sort results were recorded toward the gender neutral role cartographer / photogrammetrist.

As shown in Table 38, no significant differences were found in the proportion of male and female youth who expressed interest toward cartographer / photogrammetrist.

Table 38

Total Occupational Interest Scores For Cartographer / Photogrammetrist (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
20	1	1 (1%)	0	1%
19	1	0	1 (1%)	1%
18	4	3 (5%)	1 (1%)	3%
17	4	1 (1%)	3 (4%)	3%
Some Interest (Pile 4 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
16	10	5 (8%)	5 (7%)	7%
15	4	1 (1%)	3 (4%)	3%
14	12	7 (11%)	5 (7%)	9%
13	7	5 (8%)	2 (3%)	5%
No Interest (Pile 3 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
12	24	12 (18%)	12 (16%)	17%
11	16	7 (11%)	9 (12%)	12%
10	13	8 (12%)	5 (7%)	9%
9	14	4 (6%)	10 (13%)	10%
Some Dislike (Pile 2 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
8	9	4 (6%)	5 (7%)	7%
7	7	1 (1%)	6 (8%)	5%
6	9	4 (6%)	5 (7%)	7%
5	2	1 (1%)	1 (1%)	1%
Strong Dislike (Pile 1 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
4	2	1 (1%)	1 (1%)	1%

Chi-square value 15.408, df 17, asymp. sig (2-sided) .566

Table 39 also illustrates similar interests and disinterests expressed by male and female youth towards the gender neutral occupation chief executive officer.

Table 39

Frequency Table Series (A+B+C+D) for Chief Executive Officer Scores (sig. 00083)*

C.E.O	5	4	3	2	1	
Deck A	Strong	Some	No		Strong	Total
Tasks	Interest	Interest	Interest	Dislike	Dislike	Selections
Male	1 (1%)	4 (6%)	20 (31%)	28 (43%)	12 (18%)	65
Female	2 (3%)	6 (8%)	20 (27%)	29 (39%)	17 (23%)	74
Total / %	3 (2%)	10 (7%)	40 (29%)	57 (41%)	29 (21%)	139
(Chi-square value 1.035, df 4, sig .905)						
C.E.O.	5	4	3	2	1	
Deck B	Strong	Some	No		Strong	Total
Workplace	Interest	Interest	Interest	Dislike	Dislike	Selections
Male	2 (3%)	11 (17%)	29 (44%)	16 (25%)	7 (11%)	65
Female	8 (11%)	13 (18%)	28 (38%)	20 (27%)	5 (7%)	74
Total / %	10 (7%)	24 (17%)	57 (41%)	36 (26%)	12 (9%)	139
(Chi-square value 3.996, df 4, sig .407)						
C.E.O	5	4	3	2	1	
Deck C	Strong	Some	No		Strong	Total
Title	Interest	Interest	Interest	Dislike	Dislike	Selections
Male	8 (12%)	18 (28%)	20 (31%)	10 (15%)	9 (14%)	65
Female	12 (16%)	12 (16%)	26 (35%)	15 (20%)	9 (12%)	74
Total / %	20 (14%)	30 (22%)	45 (33%)	25 (18%)	18 (13%)	139
(Chi-square value 3.213, df 4, sig .523)						
C.E.O.	5	4	3	2	1	
Deck D	Strong	Some	No		Strong	Total
Tools	Interest	Interest	Interest	Dislike	Dislike	Selections
Male	7 (11%)	17 (26%)	16 (25%)	14 (22%)	11 (17%)	65
Female	10 (11%)	14 (19%)	25 (34%)	13 (18%)	12 (16%)	74
Total / %	17 (12%)	31 (22%)	41 (29%)	27 (19%)	23 (16%)	139
(Chi-square value 2.303, df 4, sig .680)						

As illustrated in Table 39 and Table 40, both male and female youth expressed similar scores towards performing the occupational elements for the gender neutral role chief executive officer, indicating more females may one day break through the executive-level glass ceiling.

Table 40

Total Occupational Interest Scores For Chief Executive Officer (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
20	1	1 (1%)	0	1%
19	0	0	0	0
18	2	0	2 (3%)	1%
17	3	1 (1%)	2 (3%)	2%
Some Interest (Pile 4 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
16	5	2 (3%)	3 (4%)	4%
15	8	3 (5%)	5 (7%)	6%
14	8	3 (5%)	5 (7%)	6%
13	23	12 (19%)	11 (15%)	17%
No Interest (Pile 3 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
12	10	6 (9%)	4 (5%)	7%
11	20	10 (15%)	10 (14%)	14%
10	16	9 (14%)	7 (10%)	12%
9	14	6 (9%)	8 (11%)	10%
Some Dislike (Pile 2 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
8	14	4 (6%)	10 (14%)	10%
7	8	3 (5%)	5 (7%)	6%
6	4	4 (6%)	0	3%
5	3	1 (1%)	2 (3%)	2%
Strong Dislike (Pile 1 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
4	0	0	0	0

Chi-square value 12.386, df 17, asymp. sig (2-sided) .575

Findings report most gender neutral occupations, outside of those occupations which are found within the health care industry, received similar proportions of male and female youth who were interested in performing the occupation.

Low Interest toward Green Energy and S.T.E.M. Occupations

The study examined differences in the proportion of male and female who expressed interest in working in the green energy and S.T.E.M. (Science, Technology, Engineering, and Mathematics) occupations included in the study. SPSS 19.0 statistical analysis software performed Pearson's Chi Square, Crosstabs, and Mann Whitney U tests to examine proportional differences in vocational card sort scores recorded by male and female youth toward each occupation. As shown in Table 41, significantly higher proportions of male youth were interested in wind energy engineer, solar energy engineer, and HVAC maintenance technician.

Table 41

Green Energy Occupations – Chi-Square Goodness of Fit Test Results (sig .00083)*

Green Energy Occupations	Male Mean	Female Mean	Value	Df	Asymp. Sig. (2-sided)	Mann Whitney U Test
Wind Energy Engineer	11.62	8.04	43.014	17	.000*	.000*
Solar Energy Systems Engineer	10.72	8.04	32.337	17	.004	.000*
Hydrologist	9.34	7.95	22.679	17	.066	.003
Urban Planner or Regional Planner	10.06	9.70	22.637	17	.092	.538
Green Product Marketer	9.83	9.09	5.184	17	.990	.217
Environmental Scientist	9.38	8.57	8.732	17	.891	.096
Agricultural Technician / Farmer	11.65	9.50	24.723	17	.136	.006
HVAC Maintenance Technician	11.83	8.24	42.817	17	.000*	.000*

Table 42 illustrates areas of significant difference in the proportion of male and female youth expressing interest toward wind energy engineer, a green energy occupation.

Table 42

Frequency Table Series (A+B+C+D) for Wind Energy Engineer Scores (sig. 00083)*

Wind Energy Deck A	5	4	3	2	1	
Tasks	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	9 (14%)	11 (17%)	17 (26%)	19 (29%)	7 (14%)	65
Female	2 (3%)	3 (4%)	16 (22%)	19 (26%)	34 (46%)	74
Total / %	11 (8%)	14 (10%)	33 (24%)	38 (27%)	43 (31%)	139
(Chi-square value 23.105, df 4, sig .000*)						
Wind Energy Deck B	5	4	3	2	1	
Workplace	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	7 (11%)	14 (22%)	18 (28%)	12 (19%)	14 (22%)	65
Female	3 (4%)	5 (7%)	13 (18%)	22 (30%)	31 (42%)	74
Total / %	10 (7%)	19 (14%)	31 (22%)	34 (24%)	45 (32%)	139
(Chi-square value 15.515, df 4, sig .004)						
Wind Energy Deck C	5	4	3	2	1	
Title	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	4 (6%)	20 (31%)	18 (28%)	16 (25%)	7 (11%)	65
Female	0	3 (4%)	17 (23%)	13 (18%)	41 (55%)	74
Total / %	4 (3%)	23 (17%)	35 (25%)	29 (21%)	48 (35%)	139
(Chi-square value 40.575, df 4, sig .000*)						
Wind Energy Deck D	5	4	3	2	1	
Tools	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	10 (15%)	16 (25%)	11 (17%)	17 (26%)	11 (17%)	65
Female	3 (4%)	12 (16%)	16 (22%)	20 (27%)	23 (31%)	74
Total / %	13 (9%)	29 (20%)	27 (19%)	37 (27%)	34 (25%)	139
(Chi-square value 9.201, df 4, sig .056)						

Table 43 reflects stronger male interest towards performing wind energy engineer from the green energy industry, as was also found for solar energy engineer.

Table 43

Total Occupational Interest Scores For Wind Energy Engineer (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
20	2	2 (3%)	0	1%
19	2	1 (1%)	1 (1%)	1%
18	2	2 (3%)	0	1%
17	2	2 (3%)	0	1%
Some Interest (Pile 4 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
16	5	5 (8%)	0	4%
15	1	1 (1%)	0	1%
14	8	7 (11%)	1 (1%)	6%
13	13	11 (17%)	2 (3%)	9%
No Interest (Pile 3 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
12	10	5 (8%)	5 (7%)	7%
11	7	1 (1%)	6 (8%)	5%
10	8	4 (5%)	4 (5%)	6%
9	13	7 (11%)	6 (8%)	9%
Some Dislike (Pile 2 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
8	22	6 (10%)	16 (22%)	16%
7	20	7 (11%)	13 (18%)	14%
6	7	1 (1%)	6 (8%)	5%
5	6	1 (1%)	5 (7%)	4%
Strong Dislike (Pile 1 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
4	11	2 (3%)	9 (12%)	8%

Chi-square value 43.014, df 17, sig. 000*

As shown in Table 41 – Table 43, findings indicate low female interest towards working in most of the green energy occupations which were examined in the study.

The following section compares scores indicating both similarities and differences in the expressed interests of male and female youth towards these S.T.E.M. occupations:

- Science occupations included biological technician, chemist, hydrologist, environmental scientist, cartographer / photogrammetrist, and agricultural technician /farmer. As shown in Table 44, though female youth expressed higher interest scores toward Science roles, the study did not find significant differences in the proportions of youth interested.
- Technology occupations included medical records health information technician, robotics technician, H.V.A.C. maintenance operator, management analyst, database administrator, and network system analyst. As shown in Table 44, no significant differences were found toward most Technology occupations; though higher proportions of female youth were interested in medical records health information technician; and higher proportions of male youth were interested in the occupation robotics technician.
- Engineering occupations included chemical engineer, industrial engineer, computer systems engineer, biomedical engineer, wind energy engineer, and solar energy engineer. As shown in Table 44, higher proportions of male youth were interested in the occupation wind energy engineer in the study.
- Mathematics occupations included accountant, personal financial advisor, insurance adjustor / examiner, retail sales manager, chief executive officer, and land surveyor. As shown in Table 44, only the mathematics- based occupation land surveyor recorded significantly higher proportions of male youth expressing interest in the occupation.

Findings in Table 44 are based on the completion of Pearson's Chi-square, Crosstabs, and Mann Whitney U nonparametric statistical test results for each S T.E.M. occupation.

Table 44

Youth Interest in S.T.E.M. Occupations – Pearson's Chi-Square Test Results (sig .00083)*

S.T.E.M. Occupations	Male Mean	Female Mean	Value	df	Mann Whitney U Test sig. 00083*
SCIENCE					
Biological Technician	9.56	10.46	13.037	17	sig .445
Chemist	9.00	11.16	26.615	17	sig .032
Hydrologist	9.34	7.95	22.679	17	sig .066
Environmental Scientist	9.38	8.57	8.732	17	sig .891
Cartographer / Photogrammetrist	11.66	10.97	15.408	17	sig.566
Agricultural Technician / Farmer	11.65	9.59	24.243	17	sig .136
TECHNOLOGY					
Medical Records Health Info Tech	8.91	13.49	56.148	17	sig.000*
Robotics Technician	12.69	7.41	64.281	17	sig .000*
HVAC Maintenance Operator	11.83	8.24	42.897	17	sig .000*
Management Analyst	10.34	9.84	29.013	17	sig .024
Database Administrator	10.79	9.38	18.799	17	sig .223
Network Systems Analyst	10.85	9.32	19.848	17	sig .173
ENGINEERING					
Chemical Engineer	9.91	8.74	15.749	17	sig .263
Industrial Engineer	11.65	8.46	30.376	17	sig .007
Computer Software Engineer	11.08	8.91	29.023	17	sig .023
Biomedical Engineer	9.25	11.18	21.150	17	sig .098
Wind Solar Engineer	11.62	8.04	43.014	17	sig .000*
Solar Systems Engineer	10.72	8.04	32.337	17	sig .004
MATHEMATICS					
Accountant	9.71	10.61	12.414	17	sig .715
Personal Financial Advisor	10.34	10.39	4.574	17	sig .995
Insurance Adjustor / Examiner	9.85	10.05	6.999	17	sig .958
Retail Sales Manager	10.63	10.53	9.730	17	sig .836
Chief Executive Officer	11.08	11.23	12.386	17	sig .575
Land Surveyor	11.97	7.93	44.167	17	sig .000*

Results of Table 44 suggest the majority of S.T.E.M occupations examined appear to be of interest to similar proportions of male and female youth, given few differences were noted.

Table 45 illustrates similar interests of youth toward Agricultural Tech / Farmer.

Table 45

Frequency Table Series (A+B+C+D) for Agricultural Technician / Farmer (sig. 00083)*

Farmer	5	4	3	2	1	
Deck A	Strong	Some	No		Strong	Total
Tasks	Interest	Interest	Interest	Dislike	Dislike	Selections
Male	2 (3%)	12 (19%)	14 (21%)	21 (32%)	16 (25%)	65
Female	6 (8%)	9 (12%)	12 (16%)	25 (34%)	22 (30%)	74
Total / %	8 (6%)	21 (15%)	26 (19%)	46 (33%)	37 (27%)	139
(Chi-square value 4.040, df 4, sig .544)						
Farmer	5	4	3	2	1	
Deck B	Strong	Some	No		Strong	Total
Workplace	Interest	Interest	Interest	Dislike	Dislike	Selections
Male	20 (31%)	12 (19%)	8 (12%)	15 (23%)	10 (15%)	65
Female	10 (14%)	15 (20%)	6 (8%)	15 (20%)	28 (38%)	74
Total / %	30 (22%)	27 (19%)	14 (10%)	20 (22%)	38 (27%)	139
(Chi-square value 11.946, df 4, sig .018)						
Farmer	5	4	3	2	1	
Deck C	Strong	Some	No		Strong	Total
Title	Interest	Interest	Interest	Dislike	Dislike	Selections
Male	12 (19%)	15 (23%)	16 (25%)	13 (20%)	9 (14%)	65
Female	7 (9%)	9 (12%)	13 (18%)	16 (22%)	29 (39%)	74
Total / %	19 (14%)	24 (17%)	29 (21%)	29 (21%)	38 (27%)	139
(Chi-square value 13.436, df 4, sig .009)						
Farmer	5	4	3	2	1	
Deck D	Strong	Some	No		Strong	Total
Tools	Interest	Interest	Interest	Dislike	Dislike	Selections
Male	7 (11%)	16 (25%)	11 (17%)	15 (23%)	16 (25%)	65
Female	6 (8%)	10 (14%)	15 (20%)	19 (26%)	24 (32%)	74
Total / %	13 (9%)	26 (19%)	26 (19%)	34 (24%)	40 (29%)	139
(Chi-square value 3.580, df 4, sig .466)						

The frequency distribution scores illustrate examples of a broadening of interest expressed by female youth towards the tasks and environment of Farmer through the study. As shown in Table 46, similar proportions of youth expressed interest in the role of Farmer.

Table 46

Total Occupational Interest Scores For Agricultural Technician / Farmer (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
20	3	2 (3%)	1 (1%)	2%
19	5	2 (3%)	3 (4%)	4%
18	8	4 (6%)	4 (5%)	6%
17	2	2 (3%)	0	1%
Some Interest (Pile 4 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
16	9	3 (5%)	6 (8%)	7%
15	10	8 (12%)	2 (3%)	7%
14	7	4 (6%)	3 (4%)	5%
13	4	2 (3%)	2 (3%)	3%
No Interest (Pile 3 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
12	7	6 (9%)	1 (1%)	5%
11	6	3 (5%)	3 (5%)	4%
10	8	4 (6%)	4 (5%)	6%
9	12	5 (8%)	7 (10%)	9%
Some Dislike (Pile 2 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
8	13	8 (12%)	5 (7%)	9%
7	12	5 (8%)	7 (10%)	9%
6	14	2 (3%)	12 (16%)	10%
5	7	2 (3%)	5 (7%)	5%
Strong Dislike (Pile 1 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
4	12	3 (5%)	9 (12%)	9%

Chi-square value 24.243, df 17, sig .136

Findings in Table 47 do not reflect significant differences in the proportion of male and female youth expressing interest toward aspects of the S.T.E.M. role environmental scientist.

Table 47

Frequency Table Series (A+B+C+D) for Environmental Scientist (sig. 00083)*

Environmental Scientist	5	4	3	2	1	
Deck A	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	3 (5%)	27(11%)	14 (22%)	24 (37%)	17 (26%)	65
Female	5 (7%)	7 (10%)	17 (23%)	29 (39%)	16 (22%)	74
Total / %	8 (6%)	14 (10%)	31 (22%)	53 (38%)	33 (23.7)	139
(Chi-square value .713, df 4, sig .950)						
Environmental Scientist	5	4	3	2	1	
Deck B	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	1 (1%)	2 (3%)	20 (31%)	21 (32%)	21 (32%)	65
Female	1 (1%)	3 (4%)	16 (22%)	25 (34%)	29 (39)	74
Total / %	2 (1%)	5 (4%)	36 (26%)	46 (33%)	50 (36%)	139
(Chi-square value 1.697, df 4, sig .791)						
Environmental Scientist	5	4	3	2	1	
Deck C	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	3 (5%)	9 (14%)	19 (29%)	23 (35%)	11 (17%)	65
Female	4 (5%)	12 (16%)	15 (20%)	20 (27%)	23 (31%)	74
Total / %	7 (5%)	21 (15%)	34 (25)	43 (31%)	34 (25%)	139
(Chi-square value 4.925, df 4, sig .295)						
Environmental Scientist	5	4	3	2	1	
Deck D	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	0	14 (22%)	16 (25%)	23 (35%)	12 (18%)	65
Female	2 (3%)	5 (7%)	15 (20%)	22 (30%)	30 (41%)	74
Total / %	2 (1%)	19 (14%)	31 (22%)	45 (32%)	42 (30%)	139
(Chi-square value 13.506, df 4, sig .009)						

Table 48 reports no significant difference in the proportion of male and female youth expressing interest in the occupation environmental scientist, however few youth of either gender scored this occupation with *Strong Interest* or *Some Interest* scores through the study.

Table 48

Total Occupational Interest Scores For Environmental Scientist (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
20	0	0	0	0
19	0	0	0	0
18	2	1 (1%)	1 (1%)	1%
17	0	0	0	0
Some Interest (Pile 4 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
16	3	1 (1%)	2 (3%)	2%
15	1	1 (1%)	0	1%
14	4	2 (3%)	2 (3%)	3%
13	5	4 (6%)	1 (1%)	4%
No Interest (Pile 3 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
12	14	6 (9%)	8 (10%)	10%
11	12	6 (9%)	6 (8%)	9%
10	13	8 (12%)	5 (7%)	9%
9	18	9 (14%)	9 (12%)	13%
Some Dislike (Pile 2 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
8	18	8 (12%)	10 (14%)	13%
7	19	9 (14%)	10 (14%)	14%
6	14	6 (9%)	8 (11%)	10%
5	11	3 (5%)	8 (11%)	8%
Strong Dislike (Pile 1 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
4	5	1 (1%)	4 (6%)	4%

Chi-square value 8.732, df 15, sig .891

As shown in Table 49, significantly higher proportions of female youth expressed interest towards medical records health information technician, a newer S.T.E.M. technology role.

Table 49

Frequency Table Series (A+B+C+D) for Medical Records Health Information Technician

Medical Records Deck A	5	4	3	2	1	
Tasks	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	0	6 (9%)	19 (29%)	19 (29%)	21 (32%)	65
Female	15 (20%)	30 (40%)	15 (20%)	11 (15%)	3 (4%)	74
Total / %	15 (11%)	36 (26%)	34 (25%)	30 (22%)	24 (17%)	139
(Chi-square value 46.717, df 4, sig .000*)						
Medical Records Deck B	5	4	3	2	1	
Workplace	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	4 (6%)	4 (6%)	17 (26%)	24 (37%)	16 (25%)	65
Female	16 (21%)	32 (43%)	13 (18%)	9 (12%)	4 (5%)	74
Total / %	20 (14%)	36 (26%)	30 (22%)	33 (24%)	20 (14%)	139
(Chi-square value 43.127, df 4, sig .000*)						
Medical Records Deck C	5	4	3	2	1	
Title	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	2 (3%)	4 (6%)	20 (31%)	23 (35%)	16 (25%)	65
Female	12 (16%)	27 (36%)	17 (24%)	12 (16%)	6 (8%)	74
Total / %	14 (10%)	31 (22%)	37 (27%)	35 (25%)	22 (16%)	139
(Chi-square value 32.005, df 4, sig .000*)						
Medical Records Deck D	5	4	3	2	1	
Tools	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	0	3 (5%)	19 (29%)	28 (43%)	15 (23%)	65
Female	8 (11%)	17 (23%)	22 (30%)	14 (19%)	13 (18%)	74
Total / %	8 (6%)	20 (14%)	41 (30%)	42 (30%)	28 (20%)	139
(Chi-square value 22.340, df 4, sig .000*)						

As shown in Table 49, significant proportional differences were found in the range of male and female scores toward each aspect of medical records health information technician.

Table 50

Total Occupational Interest Scores For Medical Records Health Information Technician

Strong Interest (Pile 5 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
20	2	0	2 (3%)	1%
19	2	0	2 (3%)	1%
18	6	1 (1%)	5 (7%)	4%
17	6	0	6 (8%)	4%
Some Interest (Pile 4 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
16	14	3 (5%)	11 (15%)	10%
15	10	1 (1%)	9 (12%)	7%
14	4	0	4 (5%)	3%
13	7	1 (1%)	6 (8%)	5%
No Interest (Pile 3 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
12	11	4 (6%)	7 (9%)	8%
11	15	9 (14%)	6 (8%)	11%
10	11	6 (9%)	5 (7%)	8%
9	10	9 (14%)	1 (1%)	7%
Some Dislike (Pile 2 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
8	13	7 (11%)	6 (8%)	9%
7	8	5 (8%)	3 (4%)	6%
6	13	13 (20%)	0	9%
5	5	4 (6%)	1 (1%)	4%
Strong Dislike (Pile 1 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
4	2	2 (3%)	0	1%

Chi-square value 56.148, df 16, asymp sig. (2-sided) .000*

As shown in Table 51, higher proportions of male youth expressed interest towards each aspect of the occupation robotics technician, while female interest was very low.

Table 51

Frequency Table Series (A+B+C+D) for Robotics Technician (sig. 00083)*

Robotics Technician Deck A Tasks	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	11 (17%)	19 (29%)	15 (23 %)	11 (17%)	9 (14%)	65
Female	0	4 (5%)	11 (15%)	20 (27%)	39 (53%)	74
Total / %	11 (8%)	23 (16%)	26 (19%)	31 (22%)	48 (34%)	139

(Chi-square value 42.356, df 4, sig .000*)

Robotics Technician Deck B Workplace	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	10 (15%)	17 (26%)	16 (25%)	12 (19%)	10 (15%)	65
Female	0	3 (4%)	9 (12%)	26 (35%)	36 (49%)	74
Total / %	10 (7%)	20 (14%)	25 (18%)	38 (27%)	46 (33%)	139

(Chi-square value 41.204, df 4, sig .000*)

Robotics Technician Deck C Title	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	9 (14%)	16 (25%)	20 (31%)	10 (15%)	10 (15%)	65
Female	0	3 (4%)	16 (22%)	22 (30%)	33 (45%)	74
Total / %	9 (6%)	19 (14%)	36 (26%)	32 (23%)	43 (31%)	139

(Chi-square value 34.704, df 4, sig .000*)

Robotics Technician Deck D Tools	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	19 (30%)	17 (26%)	7 (11%)	15 (23%)	7 (11%)	65
Female	2 (3%)	4 (5%)	22 (30%)	19 (26%)	27 (36%)	74
Total / %	21 (15%)	21 (15%)	29 (21%)	34 (25%)	34 (25%)	139

(Chi-square value 41.394, df 4, sig .000*)

As illustrated in Table 52, only one female youth expressed interest greater than the 12.00 point interest threshold toward robotics technician, and 10 females expressed *Strong Dislike*.

Table 52

Total Occupational Interest Scores For Robotics Technician (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
20	5	5 (8%)	0	4%
19	2	2 (3%)	0	1%
18	1	1 (1%)	0	1%
17	3	3 (5%)	0	2 %
Some Interest (Pile 4 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
16	9	9 (14%)	0	7%
15	4	3 (5%)	1 (1%)	3%
14	2	2 (3%)	0	1%
13	7	7 (11%)	0	5%
No Interest (Pile 3 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
12	10	7 (11%)	3 (4%)	7%
11	7	4 (6%)	3 (4%)	5%
10	11	5 (8%)	6 (8%)	8%
9	21	7 (11%)	14 (19%)	15%
Some Dislike (Pile 2 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
8	10	2 (3%)	8 (11%)	7%
7	13	6 (9%)	7 (10%)	9%
6	16	1 (1%)	15 (20%)	12%
5	8	1 (1%)	7 (10%)	6%
Strong Dislike (Pile 1 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
4	10	0	10 (13%)	7%

Chi-square value 64.281, df 16, sig .000*

Table 52 identifies areas of significant differences in the Total Occupational Interest Scores of male and female youth considering working in this advanced manufacturing occupation.

The study also assessed engineering interests toward the occupations biomedical engineer and industrial engineer. Table 53 reflects higher proportions of female youth interested in biomedical engineer tasks and workplace settings based on card sort results.

Table 53

Frequency Table Series (A+B+C+D) for Biomedical Engineer (sig. 00083)*

Biomedical Engineer	5	4	3	2	1	
Deck A Tasks	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	1 (1%)	6 (9%)	17 (26%)	24 (37%)	17 (26%)	65
Female	17 (23%)	24 (32%)	21 (28%)	7 (9%)	5 (7%)	74
Total / %	18 (13%)	30 (22%)	38 (27%)	31 (22%)	22 (16%)	139

(Chi-square value 40.900, df 4, sig .000*)

Biomedical Engineer	5	4	3	2	1	
Deck B Workplace	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	2 (3%)	7 (11%)	12 (19%)	24 (37%)	20 (31%)	65
Female	7 (10%)	19 (26%)	20 (27%)	16 (22%)	12 (16%)	74
Total / %	9 (6%)	26 (19%)	32 (23%)	40 (29%)	32 (23%)	139

(Chi-square value 13.390, df 4, sig .000*)

Biomedical Engineer	5	4	3	2	1	
Deck C Title	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	2 (3%)	8 (12%)	22 (34%)	22 (34%)	11 (17%)	65
Female	2 (3%)	4 (5%)	22 (30%)	21 (28%)	25 (34%)	74
Total / %	4 (3%)	12 (9%)	44 (32%)	43 (31%)	36 (26%)	139

(Chi-square value 6.244, df 4, sig .182)

Biomedical Engineer	5	4	3	2	1	
Deck D Tools	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	4 (6%)	7 (11%)	14 (21%)	23 (35%)	17 (26%)	65
Female	8 (11%)	12 (16%)	13 (18%)	22 (30%)	19 (26%)	74
Total / %	12 (9%)	19 (14%)	27 (19%)	45 (32%)	36 (26%)	139

(Chi-square value 2.246, df 4, sig .691)

As shown Table 54, while higher proportions of female youth expressed interest toward the occupation biomedical engineer, these differences were not significant.

Table 54

Total Occupational Interest Scores For Biomedical Engineer (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
20	0	0	0	0
19	0	0	0	0
18	2	0	2 (3%)	1%
17	2	1(1%)	1 (1%)	1%
Some Interest (Pile 4 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
16	3	0	3 (4%)	2%
15	9	1 (1%)	8 (11%)	6%
14	8	3 (5%)	5 (7%)	6%
13	15	7 (11%)	8 (11%)	11%
No Interest (Pile 3 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
12	13	6 (9%)	7 (9%)	9%
11	9	4 (6%)	5 (7%)	6%
10	18	6 (9%)	12 (16%)	13%
9	12	7 (11%)	5 (7%)	9%
Some Dislike (Pile 2 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
8	16	10 (15%)	6 (8%)	11%
7	16	8 (12%)	8 (11%)	11%
6	9	5 (8%)	4 (5%)	6%
5	3	3 (5%)	0	2%
Strong Dislike (Pile 1 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
4	4	4 (6%)	0	3%

(Chi-square value 21.150, df 14, sig .098)

As shown in Table 55, significantly higher proportions of male youth expressed interest toward each aspect of the occupation industrial engineer, except workplace setting.

Table 55

Frequency Table Series (A+B+C+D) for Industrial Engineer (sig. 00083)*

Industrial Engineer	5	4	3	2	1	
Deck A	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	6 (10%)	17 (26%)	14 (22%)	19 (19%)	9 (14%)	65
Female	3 (4%)	2 (3%)	24 (32%)	21 (28%)	24 (32%)	74
Total / %	9 (6%)	19 (14%)	38 (27%)	40 (29%)	33 (24%)	139
(Chi-square value 21.901, df 4, sig .000*)						
Industrial Engineer	5	4	3	2	1	
Deck B	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	1 (1%)	6 (9%)	28 (43%)	23 (35%)	7 (11%)	65
Female	5 (7%)	10 (13%)	26 (35%)	21 (28%)	12 (16%)	74
Total / %	6 (4%)	16 (11%)	54 (39%)	44 (32%)	19 (14%)	139
(Chi-square value 4.584, df 4, sig .333)						
Industrial Engineer	5	4	3	2	1	
Deck C	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	9 (14%)	17 (26%)	25 (38%)	7 (11%)	7 (11%)	65
Female	1 (1%)	4 (5%)	27 (36%)	15 (20%)	27 (36%)	74
Total / %	10 (7%)	21 (15%)	52 (37%)	22 (16%)	34 (24%)	139
(Chi-square value 28.736, df 4, sig .000*)						
Industrial Engineer	5	4	3	2	1	
Deck D	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	8 (12%)	19 (30%)	13 (20%)	16 (25%)	9 (14%)	65
Female	1 (1%)	3 (4%)	17 (23%)	24 (32%)	29 (39%)	74
Total / %	9 (6%)	22 (16%)	30 (22%)	40 (29%)	38 (27%)	139
(Chi-square value 29.280, df 4, sig .000*)						

As shown in Table 56, higher Total Occupational Interest Scores toward industrial engineer were recorded for a higher proportion of male youth than female youth in the study.

Table 56

Total Occupational Interest Scores for Industrial Engineer (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
20	1	1 (1%)	0	1%
19	0	0	0	0
18	1	1 (1%)	0	1%
17	0	0	0	0
Some Interest (Pile 4 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
16	7	5 (8%)	2 (2%)	6%
15	5	5 (8%)	0	4%
14	11	9 (14%)	2 (3%)	8%
13	10	6 (9%)	4 (5%)	7%
No Interest (Pile 3 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
12	12	6 (9%)	6 (9%)	9%
11	17	9 (14%)	8 (11%)	12%
10	13	6 (9%)	7 (10%)	9%
9	13	7 (11%)	6 (8%)	9%
Some Dislike (Pile 2 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
8	17	3 (5%)	14 (19%)	12%
7	16	3 (5%)	13 (18%)	11%
6	9	2 (3%)	7 (9%)	6%
5	3	1 (1%)	2 (3%)	2%
Strong Dislike (Pile 1 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
4	4	1 (1%)	3 (4%)	3%

(Chi-square value 30.376, df 4, sig .007)

The findings report fewer examples of significant differences in the proportion of male and female youth interested in the S.T.E.M. mathematics occupations profiled in the study.

Table 57

Frequency Table Series (A+B+C+D) for Accountant (sig. 00083)*

Accountant	5	4	3	2	1	
Deck A	Strong	Some	No		Strong	Total
Tasks	Interest	Interest	Interest	Dislike	Dislike	Selections
Male	1 (1%)	3 (4%)	17 (26%)	18 (27%)	26 (40%)	65
Female	2 (3%)	6 (8%)	22 (30%)	28 (38%)	16 (22%)	74
Total / %	3 (2%)	9 (6%)	39 (28%)	46 (33%)	42 (30%)	139
(Chi-square value 5.972, df 4, sig .201)						
Accountant	5	4	3	2	1	
Deck B	Strong	Some	No		Strong	Total
Workplace	Interest	Interest	Interest	Dislike	Dislike	Selections
Male	1 (1%)	17 (26%)	10 (15%)	24 (37%)	13 (20%)	65
Female	12 (16%)	17 (23%)	23 (31%)	13 (18%)	9 (12)	74
Total / %	13 (9%)	34 (24%)	33 (24%)	37 (27%)	22 (16%)	139
(Chi-square value 17.919, df 4, sig .001)						
Accountant	5	4	3	2	1	
Deck C	Strong	Some	No		Strong	Total
Title	Interest	Interest	Interest	Dislike	Dislike	Selections
Male	4 (3%)	8 (10%)	20 (31%)	18 (28%)	15 (23%)	65
Female	8 (11%)	13 (18%)	21 (28%)	15 (20%)	16 (22%)	74
Total / %	12 (9%)	21 (15%)	41 (29%)	33 (24%)	31 (22%)	139
(Chi-square value 3.284, df 4, sig .656)						
Accountant	5	4	3	2	1	
Deck D	Strong	Some	No		Strong	Total
Tools	Interest	Interest	Interest	Dislike	Dislike	Selections
Male	5 (8%)	13 (20%)	18 (18%)	14 (21%)	15 (23%)	65
Female	5 (7%)	10 (13%)	23 (32%)	17 (23%)	18 (24%)	74
Total / %	10 (7%)	23 (16%)	41 (29%)	31 (22%)	33 (24%)	139
(Chi-square value 2.783 df 4, sig .836)						

As shown in Table 57 and Table 58, no significant differences were recorded in the proportion of male and female youth interested in the occupation accountant.

Table 58

Total Occupational Interest Scores For Accountant (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
20	0	0	0	0
19	2	1 (1%)	1 (1%)	1%
18	2	0	2 (3%)	1%
17	2	1 (1%)	1 (1%)	1%
Some Interest (Pile 4 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
16	3	1 (1%)	2 (3%)	2%
15	6	2 (3%)	4 (5%)	4%
14	6	3 (5%)	3 (4%)	4%
13	10	3 (5%)	7 (10%)	7%
No Interest (Pile 3 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
12	8	4 (6%)	4 (5%)	6%
11	22	10 (15%)	12 (16%)	16%
10	13	6 (9%)	7 (10%)	9%
9	20	8 (12%)	12 (16%)	14%
Some Dislike (Pile 2 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
8	21	10 (15%)	11 (15%)	15%
7	9	6 (9%)	3 (4%)	6%
6	7	6 (9%)	1 (1%)	5%
5	6	4 (6%)	2 (3%)	4%
Strong Dislike (Pile 1 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
4	2	0	2 (3%)	1%

Chi-square value 12.414, df 15, sig .715

Table 59 to follow also finds no area of significant difference in the proportion of male and female youth expressing interest toward any aspect of the occupation management analyst.

Table 59

Frequency Table Series (A+B+C+D) for Management Analyst (sig. 00083)*

Management Analyst	5	4	3	2	1	
Deck A	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	1 (1%)	9 (14%)	18 (28%)	27 (41%)	10 (15%)	65
Female	4 (5%)	6 (8%)	21 (28%)	23 (31)	20 (27%)	74
Total / %	5 (4%)	15 (11%)	39 (28%)	50 (36%)	30 (21%)	139
(Chi-square value 5.725, df 4, sig ..221)						
Management Analyst	5	4	3	2	1	
Deck B	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	0	9 (14%)	25 (38%)	19 (29%)	12 (18%)	65
Female	3 (4%)	12 (16%)	22 (30%)	29 (38%)	9 (12%)	74
Total / %	3 (2%)	21 (15%)	47 (34%)	47 (37%)	21 (15%)	139
(Chi-square value 5.211 df 4, sig .266)						
Management Analyst	5	4	3	2	1	
Deck C	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	1 (1%)	8 (12%)	29 (40%)	15 (23%)	15 (23%)	65
Female	5 (7%)	7 (10%)	19 (26%)	25 (34%)	18 (14%)	74
Total / %	6 (4%)	15 (11%)	48 (35%)	49 (29%)	33 (24%)	139
(Chi-square value 6.271, df 4, sig ..290)						
Management Analyst	5	4	3	2	1	
Deck D	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	8 (12%)	18 (28%)	14 (21%)	13 (20%)	12 (18%)	65
Female	5 (7%)	15 (20%)	17 (23%)	19 (36%)	18 (24%)	74
Total / %	13 (9%)	33 (24%)	31 (22%)	32 (23%)	30 (21%)	139
(Chi-square value 3.695, df 4, sig ..594)						

Table 59 and Table 60 both show similar patterns of interest scores towards the management analyst occupation. Only 15 male youth and 12 female youth recorded Total Occupational Interest Scores greater than the 12.00 points towards the occupation.

Table 60

Total Occupational Interest Scores For Management Analyst (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
20	0	0	0	0
19	1	0	1 (1%)	1%
18	2	0	2 (3%)	1%
17	1	0	1 (1%)	1%
Some Interest (Pile 4 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
16	1	0	1 (1%)	1%
15	8	5 (8%)	3 (4%)	6%
14	7	6 (9%)	1 (1%)	5%
13	7	4 (6%)	3 (4%)	5%
No Interest (Pile 3 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
12	11	7 (11%)	4 (5%)	8%
11	21	12 (18%)	9 (12%)	15%
10	18	5 (8%)	13 (18%)	13%
9	21	13 (20%)	8 (11%)	15%
Some Dislike (Pile 2 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
8	18	3 (5%)	15 (20%)	13%
7	4	1 (1%)	3 (4%)	3%
6	10	3 (5%)	7 (10%)	7%
5	6	5 (8%)	1 (1%)	4%
Strong Dislike (Pile 1 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
4	3	1 (1%)	2 (3%)	2%

(Chi-square value 29.013, f 16, sig .024)

In summary, this chapter provided an overview of the purpose of the study, a review of sample demographics, and an explanation of how data was collected and analyzed following the completion of a series of classroom-based vocational card sort exercises by high school youth.

The findings of this chapter were presented to address each of the primary research questions posed for this study:

1. What were the expressed occupational interests of youth towards working in each of the 60 high job growth occupations examined in the study?
2. To what degree were there significant differences in the degree of occupational interest expressed by male and female youth towards working in each occupation?
3. To what degree did the proportion of male and female youth expressing interest in working in “sex-typed” and/or non-traditional occupations significantly differ?

The findings and analysis presented through this chapter are based on the results of vocational card sort exercises which were conducted by a sample of 139 youth (64 males and 74 females) at five rural high schools in southern Illinois from February 25, 2010 to May 10, 2010.

The findings presented in this chapter included the rank-order (1st through 60th) listing of occupations which were found to be of most interest to male and female youth. Based on the analysis of the vocational card sort results, a summary of relevant findings related to each of the research questions under examination has been presented for consideration.

A summary discussion which addresses the findings of each research question and offers additional conclusions and recommendations for government leaders, industry leaders, school officials, parents, and youth to consider based on these findings, is presented in the closing chapter of this paper.

CHAPTER 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This chapter provides a summary of findings for each research question, conclusions based on these major findings, and recommendations for further study.

Summary of Purpose

The purpose of the study was to measure the degree of interest expressed by male and female youth towards working in 60 occupations found across 12 high job growth industries. Included in the mix of 60 occupations examined were 25 occupations sex-typed for male workers to perform; 15 occupations sex-typed for female workers to perform; 14 occupations considered gender neutral; and 6 occupations with emerging titles and roles for workers to perform in a 21st century green energy economy.

A vocational card sort methodology was used to assess the degree of interest or disinterest youth expressed towards working in each occupation. Analysis identified areas of significant difference in the expressed occupational interest scores of male and female youth toward working in a wide range of traditional and non-traditional occupations.

The study sample included 139 youth (65 males and 74 females), age 15 – 17 years old, from seven different classrooms at five high schools in southern Illinois. The study was conducted from February 25 – May 10, 2010. Youth participants submitted both signed individual consent forms and parental consent forms to participate in the study.

The research design utilized findings from a series of vocational card sort exercises to address each research question. Youth sorted four decks of 60 vocational cards (A, B, C, D), with one card sorted for each of the 60 occupations from each deck. Youth sorted a total of 240

vocational cards (60 cards x 4 decks) into piles (1 – 5) at their desk during a 45 minute regularly scheduled classroom period to complete the study (see Appendix E for copies of cards used).

The vocational card sort exercise provided youth with the opportunity to express occupational interest through the placement of each vocational card into pile (1 – 5) as an expression of the degree of interest or dislike they felt toward each occupation. By placing a card in pile (1), the youth expressed *Strong Dislike* toward the occupational information depicted on the card. Placing the card in pile (2) reflected *Dislike*, placing the card in pile (3) *No Interest*, placing the card in pile (4) *Some Interest*, and placing the card in pile (5) reflected *Strong Interest* towards the occupational information depicted on the card.

The selected pile placement score (1 – 5) for each vocational card from each deck (A+B+C+D) produced a Total Occupational Interest Score for each occupation for each youth. The Total Occupational Interest Score represented the degree of interest youth expressed towards performing the type of occupational tasks (A), working in the type of workplace environment (B), holding the occupational title (C), and using the type of tools and technology (D) required of workers in each of the 60 occupations in the study.

The Total Occupational Interest Score for each occupation ranged from 4 points to 20 points for each youth. The combined Total Occupational Interest Scores from the sample of youth were used in the overall ranking (1st through 60th) of occupations considered to be of most interest to youth through the study. The rank-order list of occupations is found in Appendix C.

The purpose of this study was to identify examples of gender-based differences in the expressed occupational interests of youth towards working in 60 of the nation's fastest growing occupations. The study examined gender differences through both an examination of proportional differences in the total number of youth expressing similar degrees of interest

toward the occupation, as well as examined gender-based differences in the mean Total Occupational Interest Scores for groups of male and female youth toward each occupation.

SPSS 19.0 statistical analysis procedures conducted a series of Independent T-Tests, Pearson's Chi-square, Crosstabs and Mann Whitney U Tests to identify significant differences in the expressed occupational interests of youth. The results of the statistical tests were deemed significant at the Family Wise Error alpha level sig .00083* (.05/60). Even at this high alpha level (.00083*), a total of 29 of the 60 (48%) occupations in the study did record significant differences in the expressed occupational interests of male and female youth.

This chapter provides a summary of findings for each research question posed by the study, and produces compelling evidence of the existence of gender-based differences in the expressed occupational interests of male and female youth participants.

This chapter closes with a discussion of these findings and recommendations for further research and actions of government leaders, industry leaders, school administrators, and parents who are interested in increasing the flow of male and female youth toward filling the nation's critical skilled workforce pipeline and preparing for occupations desperate for a flow of new workings in the nation's high job growth industries through future years.

Summary of Findings

Research Question (1)

What were the expressed occupational interests of youth towards working in each of the 60 high job growth occupations examined in the study?

To address this research question, the researcher used data gathered from a series of vocational card sort exercises to identify the expressed occupational interests of male and female youth participants. SPSS 19.0 statistical analysis software produced descriptive statistics which

identified and rank-ordered the Total Occupational Interest Scores of male and female youth based on the mean, median, and frequency distribution of card sort scores toward each role.

To address the research question, the Total Occupational Interest Scores of youth served as the primary measurement index for expressed interest. The mean Total Occupational Interest Score of the groups of male and female youth was used for the overall ranking (1st through 60th) of each occupation in the study. A complete listing of the overall rankings of male and female youth toward each occupation, based on the mean Total Occupational Interest Scores of male and female youth, is included in Appendix C.

A rank-order listing of industries which scored the highest Total Occupational Interest Scores were: (1st) health care; (2nd) homeland security; (3rd) hospitality; (4th) construction; (5th) retail trade; (6th) geospatial technology; (7th) financial services; (8th) biotechnology; (9th) transportation; (10th) information technology; (11th) advanced manufacturing, and (12th) green energy industry occupations.

The findings also reflect mostly lower Total Occupational Interest Scores recorded by youth toward the majority of the S.T.E.M (Science, Technology, Engineering, and Mathematics) occupations examined in the study. In general, both male and female youth expressed Total Occupational Interest Scores which exceeded the established interest level indicator of 12.00 points for relatively few occupations in the study. Male youth ranked only 11 of the 60 occupations (18%) as being of at least some interest through the vocational card sort exercise. This finding reflects male youth scored 48 of the 60 occupations (82%) to be of no interest to them as they considered the different aspects of working in each occupation. Male interest was particularly low towards all occupations found in the health care industry and biotechnology industry, based on the results of the vocational card sort exercises.

Those occupations of highest interest to male youth, exceeding the 12.00 interest indicator threshold, were primarily traditional occupations for male workers to perform. The traditional male occupations of police detective, carpenter, security guard, automobile services mechanic, architect, municipal firefighter, welder / solder / cutter, airline pilot, electrician, truck driver, and robotics technician were shown to be of interest to the male youth participants. Male youth expressed their highest interest scores towards working in the male-dominated construction, transportation, advanced manufacturing, homeland security, and green energy occupations.

Female youth expressed higher occupational interest scores toward more occupation than did the male youth participants. Based on the mean Total Occupational Interest Scores for female youth, only 18 of the 60 occupations (30%) in the study were scored as being of at least some interest to the group of females. However, findings reflect a more limited range in the type of occupations found to be of interest to female youth. The largest majority of the occupations of interest to female youth were found in the health care industry (14 of 16 occupations). Findings reflect female youth scored only a few non-health care occupations from biotechnology, homeland security, and hospitality above the 12.00 point interest threshold.

Those occupations which female youth did express at least some interest towards were: police detective, physician assistant, medical doctor, physical therapist, registered nurse, counseling psychologist, social services aide, radiological technician, chef / head cook, school teacher, EMT / paramedic, pharmacy technician, lawyer, chiropractor, dietician / nutritionist, dental hygienist, veterinary technician, and medical records health information technician from the study.

Only the occupation police detective was scored to be of interest to both male and female youth. The only other occupation which came close to the 12.00 point interest threshold for both

male and female youth was chef / head cook. The findings show similar patterns of low interest scores recorded by female youth toward a majority of occupations in the study. Female youth expressed scores of no interest or dislike toward 42 of the 60 (70%) of the occupations examined, based on the mean Total Occupational Interest Scores lower than 12.00 points. This finding indicates both male and female youth expressed interest towards only a small percentage of the occupations examined in the study.

The study found female youth expressed their higher interest scores towards working in a majority of occupations found in the health care industry and the biotechnology industry. In contrast, male youth expressed their higher interest scores toward working in a majority of occupations found in construction, geospatial technology, transportation, advanced manufacturing, and green energy industries.

A relatively even number of male and female youth expressed similarly low interest scores toward working in the information technology, hospitality, retail trade, and S.T.E.M. occupations profiled in the study. The findings indicate consistently lower interest scores were recorded for both male and female youth toward working in most of the S.T.E.M occupations examined in the study. While female youth often recorded interest scores which were equal or greater than the occupational interest scores recorded by males towards Science-based occupations, the overall interest scores of both groups of male and female youth fell far short of the interest indicator threshold of 12.00 points for most non-health care science-based roles. The findings also reflect equally low scores for both male and female youth toward most technology roles, indicating this industry may face serious recruitment issues if declining interests materialize. There were a few exceptions to the finding of overall low S.T.E.M. occupational interests of youth. Male youth expressed higher interest scores toward 4 of the 6

engineering occupations; with only biomedical engineer receiving higher interest scores from female youth. Female youth expressed very high interest toward medical records health information technician, while male youth expressed strong dislike towards this role. Male youth expressed very strong interest toward robotics technician, while female youth expressed very low interest toward this role. This was one example of many which illustrated a common finding of male and female youth expressing scores of dislike toward the type of occupations the opposite gender scored to be of highest interest in the study.

This finding was most relevant when examining the findings of interest scores by male and female youth toward working in non-traditional occupations which were sex-typed for the opposite gender to perform. Without exception, female youth scored a wider range of non-traditional occupations which are commonly performed by male workers in the health care industry to be of higher interest to them than was recorded by male youth through the study. Findings presented examples of higher female interest toward each of health care occupation in the study, whether or not the role was commonly performed by male workers in most communities and workplace settings.

While male youth did express similar interests toward many of the female sex-typed occupations in the study, there were no examples of male youth expressing higher interest scores than female interest scores toward any of the non-traditional occupations for males to perform in the workplace. The study found many examples of male and female youth expressing similar ranges of scores toward a wide variety of occupations included in the study. This finding could indicate youth are either not as interested in some of the type of occupations their gender traditionally performs in the workplace, as well as reflect a broadening of interests by youth toward at least considering working in more of the non-traditional occupations.

Research Question (2)

To what degree were there significant differences in the degree of occupational interest expressed by male and female youth towards working in each occupation?

To address this research question, SPSS 19.0 statistical analysis software examined recorded differences in the mean Total Occupational Interest Scores of groups of male and female youth using a series of Independent Sample T-Tests for each occupation. Analysis identified several examples of occupations which did record significant differences in the mean Total Occupational Interest Scores of male and female youth, even at the stringent Family Wise Error rate alpha $.00083^*$ ($.05/60$). Findings reflect significant differences in the type of occupations and industries which male and female youth expressed highest interest toward performing.

As noted, female youth expressed their highest interest scores toward working in health care and biotechnology occupations; while male youth consistently expressed overall low scores toward working in high scoring occupations of interest to female youth. Conversely, male youth expressed their highest interest scores toward working in construction, transportation, advanced manufacturing, and green energy occupations; while female youth expressed low interest scores toward these same high scoring male occupational selections.

As noted, male youth expressed significantly higher interest scores towards working in the majority of male-dominated occupations. Extreme differences were also found in the Total Occupational Interest Scores of male and female youth towards working in several of the emerging green energy occupations, with significantly higher male interest toward HVAC maintenance technician, wind energy engineer, and solar energy engineer in the study.

This study provided evidence that many 21st century occupations will likely grow more gender neutral in future years if the pattern of similar interest scores expressed by male and female youth toward a majority of the occupations affects occupational choice selections.

Male and female youth also expressed similarly low interest scores towards working in most of the S.T.E.M. occupations in the study. Even with the S.T.E.M. examples, however, those occupations which male youth expressed significantly higher interest scores toward (ex. advanced robotics) received some of the lowest female interest scores in the study; and while female youth scored the occupation medical record health information technician with very high interest scores, male youth expressed equally low interest toward this emerging occupation.

In general, while female youth recorded higher Total Occupational Interest Scores towards the Science occupations, few of these differences in occupational interest scores were considered to be significant at the more stringent alpha level .00083*. Male youth did express significantly higher interest scores toward 4 of the 6 engineering occupations, including industrial engineer, computer software engineer, wind energy engineer, and solar energy systems engineer. However, female youth expressed higher interest towards biomedical engineer, though the differences in group mean scores were not significantly higher at the alpha rate established for the study.

Research Question (3)

To what degree did the proportion of male and female youth expressing interest in working in “sex-typed” and/or non-traditional occupations significantly differ?

To address this research question, the study used data gathered from the completion of the vocational card sort exercises to examine the proportion of card sort scores recorded for male and female youth toward each occupation. Data analysis examined the selected vocational card pile placement scores (1 – 5) for each occupation, and examined proportional differences in the

placement of cards by male and female youth into pile (1) Strong Dislike; pile (2) Dislike; pile (3) No Interest; pile (4) Some Interest; or pile (5) Strong Interest for each occupation through the vocational card sort exercise.

SPSS 19.0 analyzed data using Pearson Chi-square, Crosstabs, and Mann Whitney U Tests of significance for proportional differences in the vocational card sort scores recorded by groups of male and female youth toward each occupation. Analysis was also directed at examining differences in the proportion of male and female youth expressing interest toward traditional, non-traditional, or gender neutral occupations included in the study.

Based on the results of the vocational card sort exercises, the study identified a number of occupations which found significantly higher proportions of male or female youth expressing more interest toward performing the type of occupational tasks (A); working in the type of workplace environment (B); holding the occupational title (C); and using the tools and technology (D) used by workers across a variety of occupations. Frequency distribution tables of vocational card sort scores for each occupation in the study are profiled in Appendix D.

Based on the findings of this study, few could argue that significant differences in expressed occupational interests of male and female youth were the most evident when youth were considering working in occupations considered to be sex-typed for one gender to perform in the workplace. While findings reported some examples of significantly higher female interest scores recorded toward the male sex-typed occupations of chiropractor and biomedical engineer, the study identified no example of higher proportions of male youth who were interested in the female sex-typed occupations examined in the study.

As reported, significantly higher proportions of female youth were interested in 14 of the 16 health care occupations, and female youth ranked only health care occupations within their top

five highest scoring occupations in the study. Male youth, however, ranked health care occupations among their least favorite roles, and significantly lower proportions of male youth expressed interest in this industry. Male youth ranked occupations from construction, transportation, advanced manufacturing, and homeland security among those receiving the top five scores, and ranked no health care occupations in their highest ranked occupations.

The findings provide evidence that higher proportions of male and female youth expressed interest towards working in traditional occupations for each gender to perform in the workplace. However, of the 25 male sex-typed occupations, only 16 (64%) recorded significantly higher proportions of male youth who expressed interest toward working in the male-sex typed occupation than were expressed by female youth. Of the 25 male sex- total occupations, 9 (40%) recorded no significant differences in the expressed occupational interest scores of male and female youth toward the occupation

Of the 15 female sex-typed occupations, a total of 13 (87%) recorded significantly higher proportions of female youth expressing interest than were expressed by male youth for the role. Only 2 (13%) of the 15 female sex-typed occupations recorded no significant differences in the proportion of female and male youth interested in the role.

When examining differences in the proportion of male and female youth who expressed interest in the gender neutral occupations examined in the study, far fewer examples of significant differences were recorded. The findings reflected no examples of gender neutral occupations which recorded significantly higher proportions of male youth expressing high interest toward the gender neutral occupation than were recorded by female youth. However, several gender neutral occupations were of interest to a significantly higher proportion of female

youth than male youth, including physician assistant, medical doctor, EMT / paramedic, chemist, pharmacy technician, and lawyer.

As noted, significant differences in expressed occupational interest were most evident when male and female youth scored interest toward working in non-traditional occupations for each gender to perform in the workplace. Results of this study provide compelling evidence that youth continue to express high interest toward performing traditional workplace roles, and express their lowest interest toward occupations considered to be sex-typed for the opposite gender to perform in the workplace.

Of concern in the findings were consistently low male interest scores toward working in many occupations which are perceived as being commonly performed by male workers in the workplace. For example, fewer male youth than female youth expressed interest towards working in any occupation remotely associated with health care services. Findings recorded scores of no interest more commonly expressed by male youth towards working in many of the traditional occupations which are commonly performed by male workers in most communities (ex. EMT / paramedic, medical doctor, radiological technician, chiropractor, coroner, etc.).

This finding paints a troubling trend of lower male interest scores, overall, toward a majority of occupations which are dependent on recruiting a pipeline of new workers to fill these fast growing occupations across a wide range of critical industries. Of the emerging 21st century green energy occupations, two occupations received significantly higher proportions of male youth than female youth interest in the occupation (wind energy engineer and solar energy engineer). However, none of the green energy occupations received significantly higher proportions of female youth expressing higher interest than male youth toward the occupation.

The review of expressed occupational interest toward S.T.E.M. occupations identified few instances of significant differences in the proportion of male and female youth interested in the Science, Technology, Engineering, and Mathematics occupations included in the study. The findings reflect a slightly higher proportion of female youth who were interested in the Science occupations; an equal proportion of male and female youth interested in Technology occupations; a slightly higher proportion of male youth interested in most Engineering occupations; and an even number of male and female youth interested in the Mathematics-related occupations examined in the study. The study findings support theoretical assumption that gender does influence the range of occupations youth express interest toward, and those occupations perceived as being sex-typed for one gender to perform in the workplace will continue to face difficulty in recruiting a diverse workforce in future years based on these results.

Discussion of the Findings

The findings provide both timely and relevant insight into the current status of youth interests as they consider working in the 21st century world-of-work. Industry leaders have expressed for decades that an increased demand for workers from the nation's employers have outstripped the supply of skilled workers available. However, the findings of this study indicate shortages of skilled workers in key occupations may only grow worse without urgent and effective interventions to increase and broaden the occupational interests of youth to consider a wider range of occupations.

The study provides compelling evidence of both very low occupational interest scores expressed by youth, as well as significant differences in the type of occupations and industries male and female youth are considering as viable 21st century career paths. While some occupations appear to be well positioned for future growth, based on interest scores which

exceeded the 12.00 points interest threshold for both male and female youth (police detective and chef / head cook, for example), the majority of occupations in the study were found to be of little to no interest to neither male or female youth participants. The findings provide compelling evidence of an urgent need for bold action to rectify a looming gap of interested youth who are ready to fill the 21st century workforce pipeline. If the results and implications of this study are proven to hold true, industry leaders nationwide will be affected by low youth interest toward working in many emerging occupations dependent on an influx of new workers in future years.

Based on these findings, few industries can be expected to meet their goals for diversifying their 21st century workforce pipeline, as overall low interest scores were consistently recorded by male and female youth toward the majority of occupations examined in the study.

Low Occupational Interest Scores Recorded Toward Most Occupations.

Findings provide evidence of consistent patterns of low interest scores recorded by large populations of both male and female youth towards a majority of the occupations examined in the study. The study found it was more common for youth to score an occupation as being of No Interest or Dislike, than it was to find youth had scored the occupation as being of Some Interest or Strong Interest to them, based on the results of the vocational card sort exercises.

While some industries did record strong interest scores from either the group of female youth, or the group of male youth, only a few occupations from the homeland security, retail sales, financial services, and hospitality industries recorded scores which reflected at least some interest from both male and female youth in the study. However, too often these similar scores recorded by male and female youth fell far short of the 12.00 point interest threshold, indicating similarly low interest scores were expressed by a large proportion of male and female youth toward the majority of the occupations in the study.

Given that most of the youth would have never performed the type of tasks required of the occupations examined, not worked in the type of workplace environments, have not held the occupational titles, and have had limited experience using the tools or technology used by workers of the occupations examined, the finding that youth scored the majority of occupations to be of No Interest rather than of Some Interest is a troubling finding from the study.

Female Youth Were More Restricted in Occupational Interests

The findings indicate relatively limited occupational interests of female youth, with primary interests concentrated in the health care industry and biotechnology industry occupations. Female youth recorded low interest scores towards most non-health care occupations in the study. There was no other industry, other than health care, which recorded a mean Total Occupational Interest Score from the sample of female youth which exceeded the 12.00 point interest threshold. These findings imply female youth identified a limited range of occupations and industries as being of interest to them in the 21st century workplace.

Male Youth Were Not Interested in Health Care Occupations

Male youth consistently recorded low interest scores towards most health care occupations, with the lowest male scores directed toward some of the health care occupations which received the highest interest scores from female youth. Male youth even expressed scores of dislike toward many health care occupations which are commonly performed by male workers in the community (ex. chiropractor, biomedical engineer, coroner, EMT / paramedic, medical doctor, radiological technician, and pharmacy technician). Even occupations indirectly associated with medical care, such as biomedical engineer, recorded significantly lower proportions of male youth expressing interest in the occupation than were recorded for female youth. In the case of chiropractor, for example, female youth interest scores were significantly

higher than male youth scores, even though chiropractor is a male sex-typed occupation. It is probable that the health care industry is viewed by male youth as a female-dominated work environment, just as the construction, transportation, and advanced manufacturing are viewed as male-dominated work environments. This perception could explain the significant differences in expressed occupational interest of male and female youth toward working in different type of roles for each gender to consider.

Male youth in the study showed much less consideration towards working in any of the female sex-typed occupations, especially if the occupation was found in the health care industry. These findings should serve as a red flag to industry leaders seeking a diverse and representative 21st century workforce who is trained and prepared to fill the nation's critical skill shortage occupations through future years. The findings of consistently low interest scores from male youth toward these critical skill occupations in the health care industry has broad implications for a nation implementing health reform. As the nation struggles to fill a diverse pipeline of health care workers who are ready to meet estimates of growing demands for health care workers in doctor's offices, hospitals, community health clinics, and other provider groups nationwide, more must be done to reverse the trend of decreasing male interest in this critical industry.

Male Youth Considering a Wider Range of Occupations and Industries

Findings reflect male youth are considering a wider range of occupations from across a number of predominantly male-dominated industries, including construction, homeland security, transportation, advanced manufacturing, and green energy. It is likely this finding reflects different experiences of male and female youth, with male youth more likely than female youth to have had the opportunity to visit a work site in these male-dominated industries, taken a class to learned a trade in these industries, or have had a chance to visit a worksite or have known a

male role model who has performed the tasks from these traditional male-dominated occupations. Given these industries have traditionally recruited a higher percentage of male workers for the type of job openings, apprenticeships, internships, or trade training programs they offer, it is likely male youth may have also received career guidance or encouragement more directed at considering the type of male sex-typed occupations which they expressed higher interest toward performing than did female youth.

Low Interest Scores Toward S.T.E.M. Occupations

The S.T.E.M. findings of this study provide compelling evidence that more must be done engage both male and female youth towards increased interest in gaining the critical 21st century skill set required for workers in the nation's emerging S.T.E.M. occupations. Few youth expressed strong interest toward S.T.E.M. occupations, with the exception of medical records health information technician for female youth, and robotics technician for male youth.

- Higher proportions of female youth expressed interest towards the science-related occupations, but scores still fell below the 12.00 point interest indicator.
- Higher proportions of male youth expressed interest towards the engineering-related occupations, with the exception of higher female interest in biomedical engineer.
- Similar proportions of male and female youth expressed similar interest scores towards working in the technology-related and mathematics-related occupations.

Occupational Interest Depends on Perceived Congruent Fit with Gender

Congruence is the key for occupational satisfaction, both for the worker and workplace. Youth perceptions of whether or not an occupation is considered to be a congruent fit for their own career path is often based on the requirement that the role be a congruent fit for the youth's gender to perform in the workplace. Images and direct and indirect learning experiences

influence and shape youth perception of which type of occupations would be acceptable, accessible, and appropriate for someone of their gender to perform. These perceptions are often formed or reinforced through media images and messages shared through television or movies which can strengthen or reverse sex-typed stereotypes which too often limit occupational considerations away from non-traditional occupations..

Based on Bandura's research (2001), youth will express greater congruence with those occupations which through direct or indirect experiences they can identify workers of their gender performing. Sex-typed images of occupations are often instilled and validated through television shows which more frequently show female workers in traditional roles of registered nurse, or show male workers as lawyer or chemists.

However, recent television program have attempted to place both men and women performing some non-traditional occupations. Some leading television shows have shown leading characters in non-traditional roles, including female police detectives; female scientists acting as coroner and using cameras and other tools to solve crimes; and male workers serving as executive administrative assistants, receptionists, registered nurses, and lodging managers. These type of characters may help reverse the effect of sex-role stereotyping of occupations by youth.

Given that personal experiences also shape perceived occupational interests, further research is needed to determine the effect of non-traditional experiences on the expressed occupational interests of youth. Male and female youth are likely to have been provided with different type of experiences and opportunities which have shaped their occupational interests. Female youth have a higher likelihood of performing caregiver role for children as well as aging parents. Therefore, it is probable that more female youth in the study spent more time in a health care setting, or caring for others than the male youth had experienced, increasing female interest

in these roles. According to Bandura (1977), these positive experiences and associations shape self-efficacy beliefs and congruence which help youth feel more of a fit with an occupation.

This study supports this theoretical assumption given significantly higher interest scores were recorded by female youth towards working in 14 of the 16 health care occupations; and significantly higher interest scores recorded by male youth towards working in a majority of the construction, transportation, advanced manufacturing, and green energy occupations examined, which male youth are more likely to have experienced.

Findings of this study support theoretical assumptions that male and female youth expressed their highest scores of congruence and interest toward traditional occupations for each to perform in the workplace. Career development researcher Linda Gottfredson (1996) found females were more willing to try anything, expressing more individuality, in the youth studies she lead. The findings of this study did find female youth are more likely to express interest towards working in a male sex-typed occupation, than male youth interested in female sex-typed roles.

Findings from prior research studies (Bobo, et al, 1998) gave examples of male and female youth expressing increased interest in performing more types of non-traditional occupations for their gender to perform. This study supports the findings of several other studies (Pipher, 1994; Auger, et al, 2005) which identified patterns of significant difference in the willingness of males and females to consider non-traditional occupations. For example, some research findings indicate boys may be less willing to experiment with transgressing traditional gender occupational positions than girls (Francis, 1998; Pickering, 1997). This finding was validated through this study as more female youth expressed interest towards working in male

sex-typed occupations (chiropractor, biomedical engineer, chef /head cook, coroner, etc.), than were recorded for male youth interested in performing non-traditional roles for male workers.

There were no examples of traditional female occupations which recorded interest scores exceeding 12.00 points by male youth, unlike what was found with the female youth results. This finding supports the prior research findings which demonstrated boys appear to engage in greater sex-typing of occupations than girls, and girls are more likely to aspire to non-traditional occupations than were boys (Franken, 1983; White and Ouellette, 1980).

The finding also supports the research of Phillips and Imhoff which published reports that occupational stereotypes are held more strongly by males than females, and retained through adolescence (Fassinger, 2004, p. 9). Given the finding of male youth expressing consistently lower interest scores toward each of health care industry occupation, but high interest scores towards each of the male-dominated occupations in the study, it is clear male youth are affected by the sex-type perceptions of occupations and do not express as high of interest toward occupations which appear to be the other gender's job to perform in the workplace.

Other studies found girls tended to opt for a narrower range of stereotypical female occupations, suggesting girls saw fewer jobs as appropriate or open to them (Spender, 1982; Francis, 2002; Best, 1983; Nemerowicz, 1979; Adams and Walkerdine, 1986). This study supports this finding as female youth expressed interest scores which exceeded 12.00 points towards 18 occupations, and 14 of these occupations were in the health care industry. Female youth expressed disinterest toward more roles outside of health care services.

Research by Herr and Cramer (1996) found women in adolescence and young adulthood demonstrate they select from only a few occupational possibilities all too often on a sex-typed basis (p. 260). This premise was supported by the finding of female youth primarily interested in

occupations found in a limited number of industries (health care and biotechnology), and expressing their highest interest toward those roles traditionally performed by female workers in the health care environment.

This finding is also validated by the very low scores female youth expressed towards male-dominated occupations in construction, advanced manufacturing, transportation, homeland security, and green energy which is perceived to be a man's job. However, female youth did express high interest scores towards working in some male sex-typed occupations, including the roles of police detective and chiropractor which are considered to be male sex-typed roles, but also appropriate for female youth consideration.

Studies by Bandura, Barbarocelli, Capara, and Pastorelli (2001) show women are disinclined to choose careers in scientific and technical fields traditionally dominated by men. This finding was partially supported through this study, as female youth expressed relatively low interest scores toward working in most of the science and technology occupations examined in the study. The female scores were still slightly higher than male youth interest toward science occupations, and only slightly lower than male youth interest toward technology occupations. While female youth scored many of these occupations to be of the same interest as male youth scored, it was true that few of the scores for science or technology occupations exceeded the 12.00 point interest threshold, for either group, validating low interests of youth to S.T.E.M.

More recent studies by Blackhurst and Auger (2008) raised hope that more female youth were being drawn to consider a broader range of career options, which could result in more occupations becoming more gender-neutral in future years due to greater shifts of women and men entering non-traditional occupations. The research cited higher female interest in automobile services, police detectives, millwrights, and civil engineers, as example of this shift.

Findings clearly reflect some industries are poised to become more gender neutral through future years, with no significant differences in the proportions of male and female youth expressing interest towards these occupations. If the role was perceived as one performed by either gender, the study most often found both male and female youth expressed similar interests toward the performing the role in the study. The findings of this study partially support the premise of more occupations become more gender neutral, as examples of female youth expressing equally high interest scores towards the occupation police detective, for example, as well as chiropractor, coroner, medical doctor, lawyer, biomedical engineer, logistician, EMT / paramedic, etc.

Several sex-typed occupations of both male and female youth also did not report significant differences in the expressed occupational interest scores of male and female youth. Prior research studies also found less distinctive increases in occupational interest reported by males towards some female sex-typed occupations (registered nurse, executive assistant, and teacher) roles (based on information from the *Occupational Outlook Handbook 2004 – 2005*).

The findings of this study partially support this prior research finding, as male youth and female youth interest scores showed no significant differences for executive administrative assistant, public teacher, personal home care aide, retail sales manager, lodging manager, veterinary technician, and other roles commonly performed by female workers. However, the study found no examples of male youth expressing higher interest scores towards any female sex-typed occupation examined, and the highest male interest towards traditional, male roles.

While the study found examples of female youth expressing significantly higher interest scores toward a number of occupations which are commonly performed by male workers in the community, the study also found female youth were more likely to express scores of dislike

toward the majority of male sex-typed occupations from the construction, advanced manufacturing, transportation, and green energy Industries. Of interest is this same pattern was found with male youth expressing their lowest interest scores toward the type of female sex-typed occupations which received the highest interest scores from the female youth.

The findings of this study provide compelling evidence suggesting male youth consistently expressed their highest interest scores towards working in male-dominated occupations, in male-dominated industries. Findings of male interest toward male-dominated roles only tapered when considering male roles within the health care industry. Female youth also expressed their highest interest scores towards performing work commonly performed by female workers, primarily in the health care or service environment. This evidence concludes male and female youth are generally interested in different types of occupations found in different industries, unless the role is considered to be gender neutral.

Gender Neutral Occupations Recorded Fewer Differences in Interest Scores

The study provides important insight into specific areas of differences and similarities of the expressed occupational interests of male and female youth as they consider performing the type of occupational tasks, working in the type of workplace environments, holding the type of occupational titles, and using the type of tools and technologies which are used by workers in each occupation under study.

Of interest in these findings was the lack of significant differences in expressed interest scores of male and female youth towards most of the occupations considered to be gender-neutral, and perceived as being performed by both male and female workers. With the exception of significantly higher female interest towards performing gender-neutral health care occupations, few examples of significant differences in male or female youth towards working in

gender neutral occupations were identified. Similar scores were recorded to a wide range of gender neutral occupations which youth may have direct or indirect experiences knowing of either a male or worker performing the role in the workplace or in the community.

The perceived sex-type of an occupation appears to help male and female youth express similar congruence and occupational interests toward the occupation. The study found far fewer examples of significant differences in expressed male and female interest scores toward occupations which are considered to be gender neutral and open to both sexes through the study.

More Traditional Occupations Should Become More Gender Neutral

Findings clearly reflect some industries are poised to become more gender neutral through future years, with no significant differences in the proportions of male and female youth expressing interest towards these occupations. If the role was perceived as one performed by either gender, the study most often found male and female youth expressed similar interests toward the performing the role.

The study findings support current research study conclusions (Bobo, et al, 1998) suggesting many traditional sex-typed occupations are likely to become more gender neutral in future years. As expected, the majority of sex-typed occupations did find significant differences in the proportion of male or female youth expressing higher interest toward working in traditional occupation. However, more recent research findings suggest many of today's sex-typed occupations will become more gender neutral in future years based on the assumption that more male or female youth will find congruence with occupations traditionally performed by the other gender in the workplace through future years. Based on the results of this study, the findings support this premise, as equal proportions of male and female youth were likely to express similar interest scores toward a majority of the occupations examined through the study.

Female youth did show signs of expressing higher interest toward health care industry occupations whether or not they were traditionally performed by a male worker. This finding of expressed interest by male youth toward female sex-typed roles was less evident, except for findings that a large portion of sex-typed roles for female youth did not find significant differences in the proportion of male youth who also expressed interest in the role. These signs point to an indication that more traditional roles in some industries will become more gender neutral over time as more youth begin to see more workers of their own gender performing these roles in the 21st century workplace.

Vocational Card Sort Methodology was Effective for Youth Engagement

The use of the vocational card sort methodology allowed youth to voice their interests or dislikes toward an occupation in private at their desk, without their peers or teachers knowing how they scored each occupation. From observations of vocational card sort exercises, the majority of youth appeared to be engaged in the exercise of reading and sorting the decks of cards into piles. Through this exercise youth gained new insight into the type of occupational tasks, workplace environments, occupational titles, and tools and technology which are used by workers in a diverse mix of fast-growing occupations and industries.

In summary, the findings of this study are timely and relevant due to the continued warning bells of industry leaders who predict dire consequences if the gap in skills and experiences of workers today continues to fall short of what is required for the growth of new industries through future years. Clearly, it is the occupational interests, intentions and choices of youth which will determine which industries meet future recruitment and diversity goals, and which industries are able to access a pipeline of skilled workers through future years. The following conclusions and recommendations are offered to target interventions toward this goal.

CONCLUSIONS

1. It appears much more remains to be done with respect to keeping male and female youth aware of and interested in new and emerging occupations available for consideration. Industry leaders, educators, community leaders, and parents should take heed of these findings and identify effective interventions which can be utilized to better interest and encourage youth in the 21st century world-of-work.
2. Even though the mix of occupations examined in this study are predicted to be available and accessible to youth through future years, few youth expressed interest toward the majority of occupations examined. Female youth expressed interest toward working in only 30% of the occupations, and male youth expressed interest in working in only 18% of the occupations examined in the study.
3. Weak interest scores recorded for both male and female youth toward the majority of occupations examined in the study should serve as a warning sign to the nation that far too many youth are not interested in or dislike the type of critical skill shortage occupations predicted to grow in demand for new workers through future years.
4. Given only 8 of the 60 occupations (13%) scored a mean Total Occupational Interest Score greater than 12.00 points for the sample of youth, this finding suggests the nation's critical skill workforce pipeline will run dry for many occupations unless urgent attention is given today to the those factors causing youth to express limited occupational interests.
5. Given only 16 of the 25 male sex-typed occupations (64%) recorded significant differences in the expressed interests of male and female youth, it appears more sex-typed occupations will become more gender neutral in time with the influx of new workers of both genders who expressed interest in some non-traditional roles.

6. Given female youth are limiting the range of occupations they are interested in performing to occupations from the health care industry (14 of the 18 occupations of female interest), the study concludes other industries may face increased shortages of female workers due to their concentrated focus toward health care services.
7. The findings validate the continued importance of providing opportunities for youth to gain knowledge of a wide range of diverse occupational options, and the importance of helping youth explore the type of occupations which will remain accessible and available through proper education, work experiences, and planning.
8. Given male youth expressed stronger interest toward a wider range of occupations and industries than was reported by female youth, more must be done to expose female youth to a wider range of career options outside of the health care industry to help fill and diversify the nation's workforce pipeline for all emerging industries.
9. Given the 21st Century green energy occupations were some of the lowest scoring occupations in the study, primarily due to low female interest, more must be done to expose youth to the type of occupational titles, tasks, tools and technology, and workplace environments commonly found with these emerging energy occupations.
10. Given that during the study several youth were not familiar with the occupational titles of coroner, logistician, cartographer / photogrammetrist, and land surveyor, more must be done to familiarize youth to the type of new and emerging 21st century occupations through work-based learning and guest speakers visiting classrooms.
11. Given few high school age youth in the sample would have had direct experiences in the workplace at such a young age, it should concern government leaders, industry leaders,

school officials, and parents nationwide that a large majority of youth are not interested in a wide range of fast growing occupations dependent on future workers.

12. Given distinct differences in male and female youth occupational interests were found, it is probable that male and female youth have been exposed to different types of roles and workplace settings based on their gender. It is recommended youth be provided with engaging opportunities to learn and try new occupational tasks, visit unique workplace environments, and try new tools and technologies to broaden occupational interests and to help break down sex-typed stereotypes of the type of occupations which are accessible, available, and appropriate for a male or female worker to perform in the 21st century workplace.

RECOMMENDATIONS FOR PRACTICE

Industry leaders, educators, community leaders, and parents seek solutions to better engage male and female youth to see themselves as successful workers in the 21st century world-of-work. As many industries face critical shortages of skilled workers for many different types of occupations, the findings of this study indicate more remains to be done in this critical area.

The requirement for the 21st century workforce pipeline serving many industries to thrive and survive requires the introduction of new workers who are considering working in both traditional and non-traditional occupations. To be selected as an occupation of interest, however, youth must first recognize a congruent fit with the type of occupational titles, occupational tasks, tools and technology, and workplace environments of the occupation under consideration.

Given the findings of this study clearly indicate youth did not express interest toward the majority of the occupations examined in this study, the following recommendations are offered to enhance the interests of youth toward working in the nation's high job growth industries:

1. Industry leaders can expand perceptions of occupations as being available, accessible, and appropriate for workers of both genders to perform by encouraging and promoting diversity in all efforts aimed at informing, attracting, training, and recruiting workers to fill the workforce pipeline.
2. Industry leaders, government leaders, and school administrators can create more effective interventions aimed at informing and educating youth regarding the high job growth industries and occupations, and can help to dispel myths regarding the types of occupations appropriate for both genders.
3. Findings indicate youth need to have greater exposure to and understanding of the type of new and emerging occupations in need of skilled workers for the 21st century workplace, including fast growing Green Energy industry to secure a diverse workforce pipeline for 21st century high job growth roles.
4. Teachers need to better integrate occupational knowledge of both traditional and non-traditional occupations for youth to consider and explore, and seek to utilize marketing and media images which depict non-traditional characters performing traditional and non-traditional occupations in workplace settings.
5. Teachers and parents can help youth recognize different type of 21st century career paths which are available and accessible, and educate youth on the education, training, and workplace experiences needed to find a congruent fit with each career path of interest to youth, without bias or judgment.
6. Teachers and parents are encouraged to help youth break gender-based stereotypes and assumptions regarding they type of occupational titles and tasks considered to be appropriate for male and female youth to perform.

7. Teachers and parents are encouraged to serve as positive role models to help shape positive associations youth form towards the 21st century world-of-work; and are encouraged to provide direct and indirect learning experiences which can help broaden occupational interests beyond traditional roles.
8. Teachers, parents, industry leaders, and government officials are encouraged to facilitate opportunities for youth to gain on-the-job training experiences, apprenticeships, work-based learning programs, internships, and other experiences to help broaden the type of industries of interest to youth.
9. It is important youth have opportunities at school and home to experience a wide range of tasks, tools, technology, and environments to expose male and female youth have opportunities to gain hands-on experiences performing non-traditional tasks to help build self-efficacy beliefs for future performance.
10. Teachers, parents, and community leaders can be a positive role model to youth and share positive work-related experiences to reverse negative images or perceptions youth may be feeling toward 21st century occupations and industries.
11. Teachers and parents can encourage diverse expressions of occupational interests from youth, without prejudice or judgment as to whether or not a role would be viewed as being appropriate to perform based on the youth's gender.
12. Teachers are encouraged to invite speakers from non-traditional backgrounds and occupations to talk with youth about new and emerging occupations, and to establish mentoring relationships for male and female youth for positive associations and learning experiences regarding non-traditional career options.

13. Teachers and parents are encouraged to read stories to youth whose characters illustrate non-traditional workers, and take field trips to industries which can introduce male and female youth to new types of tasks and workplace environments too often considered to be restricted to one gender or the other.
14. Industry leaders, government leaders, and parents are encouraged to provide opportunities for work-based learning experiences for youth which can help each gain confidence in their ability to understand and perform the type of tasks and use the type of tools and technology which are required of workers in both traditional and non-traditional 21st century occupations.
15. Teachers and industry leaders are encouraged to create career education programs which are specifically designed to introduce more female and male youth to the type of non-traditional occupations, and to the new and emerging 21st century occupations which are not yet labeled as sex-typed for one gender to perform. Direct action by practitioners in the field can help encourage youth to gain a deeper understanding of the type of critical skill shortage occupation dependent on a diverse workforce to meet future growth demands.
16. University and College leaders can use the results of vocational card sort exercises with youth to help guide youth toward the type of degree programs which prepare students for the high job growth occupations in critical need of skilled workers which are found to be congruent with the expressed occupational interests of youth.
17. Additional vocational card sort sets should be developed to assess the occupational interests of youth toward a wider range of occupations and industries to provide a more in-depth analysis of youth interest toward new and emerging occupational titles.

RECOMMENDATIONS FOR FUTURE RESEARCH

Reasons for low occupational interest scores of male and female youth towards the majority of occupations examined in this study could be due to many factors. The findings emphasize the importance of understanding the reasons for low interest of youth, and to identify interventions which can be taken to help reverse these troubling findings.

1. Research is needed to identify the specific areas of interest and disinterest of youth toward either (A) performing the tasks of an occupation; (B) working in the type of workplace environment; (C) holding the occupational title; or (D) using the type of tools and technology of workers in each occupation. Better understanding the specific areas of interest and dislike can help industry leaders work to remove barriers preventing more youth from finding congruence with a wider range of promising occupations desperate for new workers in future years.
2. Research is needed to identify whether low interest scores toward new and emerging 21st century occupations are due to a lack of knowledge regarding new occupational titles; a perception that a new occupational option is not congruent for their gender to perform; or would not be accessible, available, or expected that they could perform; or due to a lack of personal experiences or exposure to the type of tasks workers in new occupations would perform through direct or indirect learning experiences regarding these roles.
3. Research is needed to better understand the specific type of barriers which are limiting male interest in health care roles commonly performed by male workers, and restricting female interest in the tasks, tools, titles, or working environments which are found outside of the in the health care industry and into new fields.

4. Further research is needed to identify the type of direct and indirect learning experiences which have shaped male and female youth perceptions of occupational options, and to measure the effectiveness of direct interventions geared towards creating positive experiences and associations toward non-traditional occupations to increase interest of youth toward new roles.
5. Research is needed to further evaluate the ability of direct and indirect experiential learning opportunities to increase youth interests related to performing the type of tasks, using the type of tools and technology, and working in the type of environments across a range of traditional and non-traditional occupations seeking a flow of new diverse workers through future years.
6. Future research is needed to validate the use of the vocational card sort methodology for the assessment of occupational interests of youth, and to test the validity of the vocational cards methodology in its' ability to achieve the intended results of the study with different populations of youth, in different communities, and with different occupations.
7. Research is needed to further test the criterion-related validity of the findings by demonstrating that comparable results are found across the vocational card sort test scores when replicated using an external assessment tool.
8. Research can test the construct validity of the instrument by examining the degree to which certain explanatory concepts or constructs account for the performance of the test.
9. Further research can test the reliability of using the vocational card sort methodology to determine if the results from the study are internally consistent within categories of occupations for youth respondents, as well as to test if the results of the study remain consistent over time through longitudinal studies.

10. Research is recommended to further determine the effect of increased occupational knowledge regarding the type of occupational tasks, titles, tools, technology, and workplace environments on expressed occupational interests.
11. Research is recommended to further validate the use of the vocational card sort exercises as an effective tool for use in identifying, scoring, and ranking the expressed occupational interests of male and female youth across a wide range of high job growth occupations and industries desperate for an increased flow of new workers in the 21st century world-of-work.

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APPENDICES

APPENDIX A

Letter of Invitation to High Schools

January 22, 2010

High School Principal
Southern Illinois High School
City, IL Zip

Dear (Principal),

Thank you for allowing me time to share information on a six-county research study planned for February – April, 2010 which is designed to examine the 21st century vocational interests of southern Illinois youth. The dissertation research study will result in a comprehensive report detailing southern Illinois youth interest in working in 60 of the nation's fastest growing occupations.

The research study will be conducted with a mix of southern Illinois youth attending high schools within the WIA 25 service area of Franklin, Williamson, Jackson, Perry, Hamilton, and Jefferson counties. Each Principal from each high school in this targeted area is being contacted to encourage a random mix of school's involvement in the study. To participate, one or two teachers are needed to serve as a Host Teacher for the study, and to allow a 45-minute classroom-based exercise to be conducted with youth during one regularly scheduled classroom period.

The study is performed as a series of vocational card sort exercises youth engage in at their desk. Youth are provided a research packet with four decks of cards detailing the occupational titles, tasks, tools, technologies, and workplace environments of 60 occupations. Youth sort the cards into piles 1 – 5 based on the degree of interest they have toward the occupational information depicted on each card. Sorted cards are sealed in envelopes and provided to the researcher at the end of the classroom period. Based on the vocational card sort results, a Total Occupational Interest Score is recorded.

Each participating high school and host teacher will receive a summary copy of the research findings at the completion of this study. Teachers who host the study with one classroom of youth will receive a \$25 gift certificate.

To allow your high school to participate in the study, please have one or two teachers return the enclosed High School Teacher Host Form to Becky Robinson, Project Director, 1014 S. Glenview Drive, Carbondale, IL 62901 at your earliest convenience. I have enclosed a stamped return envelope for you. My fax is (618) 549-1793 if that is more convenient for you. Please call (618) 534-8103 with any questions.

Thank you very much for your consideration of this request.

Sincerely,

Becky S. Robinson

APPENDIX B

Individual and Parent Consent Forms

High School Student Assent Form

Introduction to the Researcher

My name is Becky Robinson and I am a doctoral student in the Department of Workforce Education and Development at Southern Illinois University Carbondale.

Request for your participation in a classroom-based research study

I am asking your voluntary participation in my research study which will be held in your classroom during one-class period. Your participation in the research study is voluntary. If you choose to participate, you will be provided with a packet containing four decks of vocational cards. You will be asked to read each card and place the card in pile (1 – 5) at your desk. The exercise will take about 45 minutes to complete.

Placing a card in pile (1) indicates you have Strong Dislike; pile (2) Dislike; pile (3) No Interest; pile (4) Some Interest; and pile (5) Strong Interest in performing the task, using the tool or technology, working in the workplace environment, or holding the occupational title depicted on each card. You will place your piles of sorted cards into envelopes, seal the envelopes, and place them back into the packet you were provided.

Results of the card sorts will reflect the degree of interest you express toward working in 60 different occupations. Your scores will remain confidential to all others. You will receive a copy of your Occupational Interest Profile scores at the end of the study.

Focus of the Research Study

The results of the series of vocational card sort exercises will provide a snapshot of the expressed occupational interests of youth considering working in 60 of the nation's fastest growing occupations. The study will involve local high school students.

Research Study Contacts

If you have any questions about the study, please contact me, Becky Robinson, at (618) 534-8103. My supervisor, John Washburn, Ed.D. can be reached at (618) 453-3313.

Parental Consent Forms Required (youth age 18 and younger)

Youth participants (younger than age 18 years old) will also be required to provide a Parent Consent Form to the host teacher indicating permission to participate in the study. Please provide the Parent Consent Form and research study information to a parent or guardian to gain their permission to participate in the study. Please return the signed Parent Consent Form to the teacher prior to the classroom-based exercise.

(This letter included a consent form for youth to complete)

This project has been reviewed and approved by the SIUC Human Subjects Committee. Questions concerning your rights as a participant in this study may be addressed to the Committee Chairperson, Office of Research Development and Administration, Southern Illinois University Carbondale, IL 62901. Please call (618) 453-4533 or sihusc@siu.edu.

Parent Consent Form

I have read the material provided and my questions have been answered to my satisfaction regarding the classroom-based study my child will be participating in.

I received a cover letter with the Parent Consent Form which contains relevant information regarding the study, and provides the contact name and phone number of the Researcher, should I have questions regarding the study. I realize I may request my child withdraw from the study without prejudice at any time.

I understand there are no foreseeable risks or discomforts my child will be subjected to in the completion of this research study. I understand my child will be sorting four (4) decks of cards into piles (1 – 5) at their desk for the study.

I understand the benefits of the study will be to examine the occupational interests of southern Illinois youth as they consider working in 60 of the nation's fastest growing occupations.

I understand a copy of my child's Occupational Interest Profile scores will be kept confidential, but will be provided to my child at the completion of the study.

I consent to allow my child to participate in the classroom-based research study.

Signature _____ Date: _____

Please print your name: _____

Please print your Youth's name: _____

High School _____

Host Teacher _____

Please return this Parent Consent Form through your child to the host teacher prior to the classroom-based exercise. Thank you!

(This form was accompanied by a cover letter to each parent explaining the study)

APPENDIX C

Rank Order Listing of Occupational Interests

TABLE C1

Rank order listing (1st – 60th) of Occupations Of Interest to the Sample of Youth Based on Total Occupational Interest Scores Recorded For Each Occupation in the Study.

1. **Police Detective** – 1883 total; 13.55 mean
2. **Physician Assistant** – 1748 total; 12.58 mean
3. **Medical Doctor** – 1746 total; 12.56 mean
4. **Physical Therapist** – 1727 total; 12.42 mean
5. **Registered Nurse** – 1693 total; 12.18 mean
6. **Counseling Psychologist** – 1687 total; 12.14 mean
7. **Veterinary Technician or Technologist** – 1678 total; 12.07 mean
8. **Social and Human Service Assistant** – 1671 total; 12.02 mean
9. **Radiological Technician** – 1654 total; 11.90 mean
10. **Chef and Head Cook** – 1640 total; 11.79 mean
11. **Security Guard** – 1627 total; 11.71 mean
12. **Public School Teacher** – 1617 total; 11.63 mean
13. **EMT / Paramedic** – 1596 total; 11.48 mean
14. **Pharmacy Technician** – 1589 total; 11.43 mean
15. **Chiropractor** – 1585 total; 11.40 mean
16. **Lawyer** – 1585 total points / 11.40 mean
17. **Medical Records Health Information Technician** – 1577 total; 11.35 mean
18. **Dietician or Nutritionist** – 1573 total; 11.32 mean
19. **Cartographer or Photogrammetrist** – 1570 total; 11.29 mean
20. **Carpenter** – 1563 total; 11.24 mean

21. **Dental Hygienist** – 1557 total; 11.20 mean
22. **Chief Executive Officer** – 1551 total; 11.16 mean
23. **Automobile Service Master Mechanic** – 1548 total; 11.14 mean
24. **Architect** – 1531 total; 11.02 mean
25. **Municipal Firefighter** – 1530 total; 11.01 mean
26. **Retail Sales Manager** – 1470 total; 10.58 mean
27. **Agricultural Technician / Farmer** – 1467; 10.55 mean
28. **Welder / Cutter / Solder / Brazier** – 1458 total; 10.49 mean
29. **Personal Home Care Aide** – 1451 total; 10.44 mean
30. **Personal Financial Advisor** – 1441 total; 10.37 mean
31. **Coroner** – 1438 total; 10.35 mean
32. **Executive Administrative Assistant** – 1431 total; 10.29 mean
33. **Biomedical Engineer** – 1428 total; 10.27 mean
34. **Speech Language Pathologist** – 1428 total; 10.27 mean
35. **Lodging Manager** – 1420 total; 10.22 mean
36. **Industrial Engineer** – 1420 total; 10.22 mean
37. **Airline Pilot** – 1417 total; 10.19 mean
38. **Accountant** – 1416 total; 10.19 mean
39. **Electrician** – 1414 total; 10.17 mean
40. **Chemist** – 1411 total; 10.15 mean
41. **Biological Technician** – 1402 total; 10.09 mean
42. **Management Analyst** – 1400 total; 10.07 mean
43. **Database Administrator** – 1395 total; 10.04 mean

44. **Logistician** – 1390 total; 10.00 mean
45. **Insurance Examiner, Adjustor, Investigator** – 1385 total; 9.96 mean
46. **Network Systems Data Comm. Analyst** – 1382 total; 9.94 mean
47. **Computer Software Engineer** – 1379 total; 9.92 mean
48. **HVAC Operations Maintenance Technician** – 1379 total; 9.92 mean
49. **Robotics Technician** – 1373 total; 9.88 mean
50. **Urban Planner / Regional Planner** – 1372 total; 9.87 mean
51. **Land Surveyor** – 1365 total; 9.82 mean
52. **Wind Energy Engineer** – 1350 total; 9.71 mean
53. **Truck Driver** – 1347 total; 9.69 mean
54. **Green Marketer** – 1312 total; 9.44 mean
55. **Solar Energy Systems Engineer** – 1292 total; 9.29 mean
56. **Chemical Engineer** – 1291 total; 9.29 mean
57. **Railroad Conductor / Yardmaster** – 1256 total; 9.03 mean
58. **Environmental Scientist** – 1245 total; 8.95 mean
59. **Hazardous Waste Removal Worker** – 1223 total; 8.80 mean
60. **Hydrologist** – 1195 total; 8.60 mean

TABLE C2

Rank-Order Listing (1st – 60th) of Occupations of Interest to Male Youth Based on Total Occupational Interest Scores Recorded For Males Toward Each Occupation in the Study.

1. **Automobile Service Master Mechanic** – (m) 14.06 / (f) 8.57
2. **Carpenter**- (m) 13.80 / (f) 8.86
3. **Police Detective** – (m) 13.67 / (f) 13.47
4. **Welder / Cutter / Solder / Brazier** – (m) 13.55 / (f) 7.79
5. **Security Guard** – (m) 13.32 / (f) 10.29
6. **Electrician** – (m) 13.17 / (f) 7.54
7. **Architect** – (m) 12.92 / (f) 9.34
8. **Robotics Technician** – (m) 12.69 / (f) 7.41
9. **Municipal Firefighter** – (m) 12.63 / (f) 9.58
10. **Truck Driver** – (m) 12.06 / (f) 7.61
11. **Airline Pilot** – (m) 12.05 / (f) 8.57
12. **Land Surveyor** – (m) 11.97 / (f) 7.93
13. **HVAC Operations Maintenance Technician** – (m) 11.83 / (f) 8.24
14. **Agriculture Technician / Farmer** – (m) 11.65 / (f) 9.59
15. **Cartographer / Photogrammetrist** – (m) 11.66 / (f) 10.97
16. **Industrial Engineer** – (m) 11.65 / (f) 8.46
17. **Wind Energy Engineer** – (m) 11.62 / (f) 8.04
18. **Chef or Head Cook** – (m) 11.62 / (f) 12.12
19. **Physical Therapist** – (m) 11.26 / (f) 13.45
20. **Railroad Conductor or Yardmaster** – (m) 11.11 / (f) 7.21
21. **Computer Software Engineer** – (m) 11.08 / (f) 8.91

22. **Chief Executive Officer** – (m) 11.08 / (f) 11.23
23. **Veterinary Technician or Technologist** – (m) 11.02 / (f) 13.00
24. **Counseling Psychologist** – (m) 10.95 / (f) 13.18
25. **Public School Teacher** – (m) 10.97 / (f) 12.57
26. **Network Systems Data Communications Analyst** – (m) 10.85 / (f) 9.32
27. **Database Administrator** – (m) 10.79 / (f) 9.38
28. **Social and Human Service Assistant** – (m) 10.73 / (f) 13.14
29. **Solar Energy Systems Engineer** – (m) 10.72 / (f) 8.04
30. **Retail Sales Manager** – (m) 10.63 / (f) 10.53
31. **Personal Financial Advisor** – (m) 10.34 / (f) 10.39
32. **Management Analyst** – (m) 10.34 / (f) 9.84
33. **Lodging Manager** – (m) 10.23 / (f) 10.20
34. **Lawyer** – (m) 10.23 / (f) 12.43
35. **Medical Doctor** – (m) 10.09 / (f) 14.73
36. **Urban Planner / Regional Planner** – (m) 10.06 / (f) 9.70
37. **Dietician / Nutritionist** – (m) 9.97 / (f) 12.50
38. **Logistician** – (m) 9.95 / (f) 10.04
39. **Physician Assistant** – (m) 9.94 / (f) 14.89
40. **Chemical Engineer** – (m) 9.91 / (f) 8.74
41. **Radiological Technician** – (m) 9.86 / (f) 13.69
42. **Insurance Adjustor, Examiner, Investigator** – (m) 9.85 / (f) 10.05
43. **Green Marketer** – (m) 9.83 / (f) 9.09
44. **Executive Administrative Assistant** – (m) 9.82/ (f) 10.72

45. **Coroner** – (m) 9.77 / (f) 10.85
46. **Hazardous Waste Removal Worker** – (m) 9.71 / (f) 8.00
47. **Accountant** – (m) 9.71 / (f) 10.61
48. **EMT / Paramedic** – (m) 9.74 / (f) 13.01
49. **Biological Technician** – (m) 9.56 / (f) 10.46
50. **Personal Home Care Aide** – (m) 9.55 / (f) 11.22
51. **Chiropractor** – (m) 9.54 / (f) 13.04
52. **Pharmacy Technician** – (m) 9.46 / (f) 13.17
53. **Environmental Scientist** – (m) 9.38 / (f) 8.57
54. **Hydrologist** – (m) 9.34 / (f) 7.95
55. **Registered Nurse** – (m) 9.26 / (f) 14.74
56. **Biomedical Engineer** – (m) 9.25 / (f) 11.18
57. **Speech Language Pathologist** – (m) 9.08 / (f) 11.32
58. **Chemist** – (m) 9.00 / (f) 11.16
59. **Medical Records Health Information Technician** – (m) 8.91 / (f) 13.49
60. **Dental Hygienist** – (m) 8.71 / (f) 13.39

TABLE C3

Rank-Order List (1st – 60th) of Occupations of Interest to Female Youth based on Total Occupational Interest Scores Recorded for Females For Each Occupation in the Study.

1. **Physician Assistant** – (f) 14.89 / (m)9.94
2. **Registered Nurse** – (f) 14.74 / (m) 9.26
3. **Medical Doctor** – (f) 14.73 / (m) 10.09
4. **Radiological Technician** – (f) 13.69 / (m) 9.86
5. **Medical Records Health Information Technician** – (f) 13.49 / (m) 8.91
6. **Police Detective** – (f) 13.47 / (m) 13.63
7. **Physical Therapist** – (f) 13.45 / (m) 11.26
8. **Dental Hygiene** – (f) 13.39 / (m) 8.71
9. **Counseling Psychology** – (f) 13.18 / (m) 10.95
10. **Pharmacy Technician** – (f) 13.17 / (m) 9.46
11. **Social and Human Service Assistant** – (f) 13.14 / (m) 10.73
12. **Chiropractor** – (f) 13.04 / (m) 9.54
13. **EMT / Paramedic** – (f) 13.00 / (m) 9.74
14. **Veterinary Technician or Technologist** – (f) 13.00 / (m) 11.02
15. **Public School Teacher** – (f) 12.57 / (m) 10.87
16. **Dietician / Nutritionist** – (f) 12.50 / (m) 9.97
17. **Lawyer** – (f) 12.43 / (m) 10.23
18. **Chef or Head Cook** – (f) 12.12 / (m) 11.42
19. **Speech Language Pathologist** – (f) 11.32 / (m) 9.08
20. **Chief Executive Officer** – (f) 11.23 / (m) 11.08
21. **Personal Home Care Aide** – (f) 11.22 / (m) 9.55

22. **Biomedical Engineer** – (f) 11.18 / (m) 9.25
23. **Chemist** – (f) 11.16 / (m) 9.00
24. **Cartographer / Photogrammetrist** – (f) 10.97 / (m) 11.66
25. **Coroner** – (f) 10.85 / (m) 9.77
26. **Executive Administrative Assistant** – (f) 10.72/ (m) 9.82
27. **Accountant** – (f) 10.61 / (m) 9.71
28. **Retail Sales Manager** – (f) 10.53 / (m) 10.63
29. **Biological Technician** – (f) 10.46 / (m) 9.56
30. **Personal Financial Advisor** – (f) 10.39 / (m) 10.34
31. **Security Guard** – (f) 10.29 / (m) 13.32
32. **Lodging Manager** – (f) 10.20 / (m) 10.23
33. **Insurance Adjustor, Examiner, Investigator** – (f) 10.05 / (m) 9.85
34. **Logistician** – (f) 10.04 / (m) 9.95
35. **Management Analyst** – (f) 9.84 / (m) 10.34
36. **Urban Planner / Regional Planner** – (f) 9.70 / (m) 10.06
37. **Agricultural Technician / Farmer** – (f) 9.59 / (m) 11.65
38. **Municipal Firefighter** – (f) 9.58 / (m) 12.63
39. **Database Administrator** – (f) 9.38 / (m) 10.79
40. **Architect** – (f) 9.34 / (m) 12.92
41. **Network Systems Data Communications Analyst** – (f) 9.32 / (m) 10.85
42. **Green Marketer** – (f) 9.09 / (m) 9.83
43. **Computer Software Engineer** – (f) 8.91 / (m) 11.08
44. **Carpenter** – (f) 8.86 / (m) 13.80

45. **Chemical Engineer** – (f) 8.74 / (m) 9.91
46. **Automobile Service Master Mechanic** – (f) 8.57 / (m) 14.06
47. **Environmental Scientist** – (f) 8.57 / (m) 9.38
48. **Airline Pilot** – (f) 8.57 / (m) 12.05
49. **Industrial Engineer** – (f) 8.46 / (m) 11.65
50. **HVAC Operations Maintenance Technician** – (f) 8.24 / (m) 11.83
51. **Wind Energy Engineer** – (f) 8.04 / (m) 11.62
52. **Solar Energy Systems Engineer** – (f) 8.04 / (m) 10.72
53. **Hazardous Waste Removal Worker** – (f) 8.00 / (m) 9.71
54. **Hydrologist** – (f) 7.95 / (m) 9.34
55. **Land Surveyor** – (f) 7.93 / (m) 11.97
56. **Welder / Cutter / Solder / Brazier** – (f) 7.79 / (m) 13.55
57. **Truck Driver** – (f) 7.61 / (m) 12.06
58. **Electrician** – (f) 7.54 / (m) 13.17
59. **Robotics Technician** – (f) 7.41 / (m) 12.69
60. **Railroad Conductor or Yardmaster** – (f) 7.21 / (m) 11.11

APPENDIX D

Frequency Distribution of Vocational Card Sort Scores

D1A

Rank #1 – Police Detective

Frequency Distribution Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
20	20	9 (14%)	11 (15%)	14%
19	4	2 (3%)	2 (3%)	3%
18	5	1 (1%)	4 (5%)	4%
17	12	8 (12%)	4 (5%)	9%

Some Interest (Pile 4 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
16	11	6 (9%)	5 (7%)	8%
15	14	8 (12%)	6 (8%)	10%
14	6	3 (5%)	3 (4%)	4%
13	8	2 (3%)	6 (8%)	6%

No Interest (Pile 3 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
12	14	6 (9%)	8 (11%)	10%
11	12	4 (6%)	8 (11%)	9%
10	6	3 (5%)	3 (4%)	4%
9	6	2 (3%)	4 (5%)	4%

Some Dislike (Pile 2 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
8	2	1 (1%)	1 (1%)	1%
7	4	2 (3%)	2 (3%)	3%
6	8	5 (8%)	3 (4%)	6%
5	5	2 (3%)	3 (4%)	4%

Strong Dislike (Pile 1 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
4	2	1 (1%)	1 (1%)	1%

Pearson Chi-Square value 8.145, df 16, asymp. sig. (2-sided) .944

D1B

Vocational Card Sort Scores – Police Detective (Rank #1)

Frequency Table Series (sig. 00083)*

Police Detective Deck A Tasks	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	13 (20%)	20 (31%)	11 (17%)	13 (20%)	8 (12%)	65
Female	18 (24%)	24 (32%)	15 (20%)	11 (15%)	6 (8%)	74
Total / %	31 (20%)	44 (32%)	26 (19%)	24 (17%)	14 (10%)	139

(Chi-square value 1.662, df 4, sig .798)

Police Detective Deck B Workplace	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	15 (23%)	21 (32%)	11 (17%)	9 (14%)	9 (14%)	65
Female	22 (30%)	23 (31%)	14 (19%)	9 (12%)	6 (8%)	74
Total / %	37 (27%)	44 (32%)	25 (18%)	18 (13%)	15 (11%)	139

(Chi-square value 1.800, df 4, sig .772)

Police Detective Deck C Title	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	12 (19%)	25 (39%)	15 (23%)	6 (9%)	7 (11%)	65
Female	14 (19%)	21 (28%)	17 (23%)	14 (19%)	8 (11%)	74
Total / %	26 (19%)	46 (33%)	32 (23%)	20 (14%)	15 (11%)	139

(Chi-square value 3.325, df 4, sig .505)

Police Detective Deck D Tools	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	21 (32%)	17 (26%)	12 (19%)	6 (9%)	9 (14%)	65
Female	16 (22%)	17 (23%)	13 (17%)	15 (20%)	13 (18%)	74
Total / %	37 (27%)	34 (25%)	25 (18%)	21 (15%)	22 (16%)	139

(Chi-square value 4.737, df 4, sig .315)

D2A

Rank #2 – Physician Assistant

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
20	8	0	8 (11%)	6%
19	7	1 (1%)	6 (8%)	5%
18	5	0	5 (7%)	4%
17	10	2 (3%)	8 (11%)	7%

Some Interest (Pile 4 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
16	12	1 (1%)	11 (15%)	9%
15	12	2 (3%)	10 (14%)	9%
14	11	4 (6%)	7 (9%)	8%
13	8	6 (9%)	2 (3%)	6%

No Interest (Pile 3 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
12	8	4 (6%)	4 (5%)	6%
11	11	9 (13%)	2 (3%)	8%
10	6	2 (3%)	4 (5%)	4%
9	11	10 (15%)	1 (1%)	8%

Some Dislike (Pile 2 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
8	9	8 (12%)	1 (1%)	7%
7	7	6 (4%)	1 (1%)	5%
6	7	5 (7%)	2 (3%)	5%
5	3	3 (5%)	0	2%

Strong Dislike (Pile 1 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
4	4	2 (3%)	2 (3%)	3%

Chi-square value 63.459, df 17, asymp. sig (2-sided) .000*

D2B

Vocational Card Sort Scores – Physician Assistant (Rank #2)

Frequency Table Series (sig. 00083)*

Physician Assistant Deck A Tasks	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	5 (8%)	12 (19%)	16 (25%)	19 (30%)	13 (20%)	65
Female	20 (27%)	27 (37%)	13 (18%)	9 (12%)	5 (7%)	74
Total / %	25 (18%)	39 (28%)	29 (21%)	28 (21%)	18 (13%)	139

(Chi-square value 21.715, df 4, sig .000*)

Physician Assistant Deck B Workplace	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	3 (5%)	12 (19%)	16 (25%)	16 (25%)	18 (28%)	65
Female	35 (47%)	21 (28%)	10 (14%)	4 (5%)	4 (5%)	74
Total / %	38 (27%)	33 (24%)	26 (19%)	20 (14%)	22 (16%)	139

(Chi-square value 46/508, df 4, sig .000*)

Physician Assistant Deck C Title	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	1 (1%)	9 (14%)	20 (31%)	27 (42%)	8 (12%)	65
Female	27 (30%)	30 (41%)	14 (19%)	7 (10%)	1 (1%)	74
Total / %	28 (17%)	39 (28%)	34 (25%)	34 (25%)	9 (6%)	139

(Chi-square value 48.370, df 4, sig .000*)

Physician Assistant Deck D Tools	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	2 (3%)	7 (11%)	16 (25%)	26 (40%)	14 (22%)	65
Female	15 (20%)	33 (45%)	11 (15%)	8 (11%)	7 (10%)	74
Total / %	17 (12%)	40 (29%)	27 (19%)	34 (24%)	21 (15%)	139

(Chi-square value 39.212, df 4, sig .000*)

D3A

Rank #3 - Medical Doctor

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
20	5	1 (1%)	4 (5%)	4%
19	5	1 (1%)	4 (5%)	4%
18	9	1 (1%)	8 (11%)	7%
17	12	1 (1%)	11 (15%)	9%

Some Interest (Pile 4 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
16	11	1 (1%)	10 (14%)	8%
15	9	3 (5%)	6 (8%)	7%
14	9	3 (5%)	6 (8%)	7%
13	11	5 (8%)	6 (8%)	8%

No Interest (Pile 3 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
12	9	4 (6%)	5 (7%)	7%
11	12	6 (9%)	6 (9%)	9%
10	8	6 (9%)	2 (3%)	6%
9	10	8 (12%)	2 (3%)	7%

Some Dislike (Pile 2 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
8	8	7 (11%)	1 (1%)	6%
7	9	7 (11%)	2 (3%)	7%
6	8	8 (12%)	0	6%
5	4	3 (5%)	1 (1%)	3%

Strong Dislike (Pile 1 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
4	0	0	0	0

Pearson Chi-Square Value 48.442, df 15, sig .000*

D3B

Vocational Card Sort Scores – Medical Doctor (Rank #3)

Frequency Table Distribution for Medical Doctor Scores (sig. 00083)*

Medical Doctor Deck A Tasks	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	3 (5%)	10 (15%)	20 (31%)	18 (28%)	14 (22%)	65
Female	18 (24%)	29 (39%)	13 (18%)	9 (12%)	5 (7%)	74
Total / %	21 (15%)	39 (28%)	33 (24%)	27 (14%)	19 (14%)	139

(Chi-square value 28.254, df 4, sig .000*)

Medical Doctor Deck B Workplace	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	6 (9%)	8 (12%)	21 (32%)	21 (32%)	9 (14%)	65
Female	27 (37%)	25 (34%)	15 (20%)	4 (5%)	3 (4%)	74
Total / %	33 (24%)	33 (24%)	36 (26%)	25 (18%)	12 (9%)	139

(Chi-square value 37.255, df 4, sig .000*)

Medical Doctor Deck C Title	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	2 (3%)	11 (17%)	21 (32%)	18 (28%)	13 (20%)	65
Female	18 (24%)	33 (45%)	14 (14%)	6 (8%)	3 (4%)	74
Total / %	20 (14%)	44 (32%)	35 (25%)	24 (17%)	16 (12%)	139

(Chi-square value 37.022, df 4, sig .000*)

Medical Doctor Deck D Tools	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	4 (6%)	7 (11%)	12 (19%)	23 (35%)	19 (29%)	65
Female	12 (16%)	32 (43%)	12 (16%)	12 (16%)	6 (8%)	74
Total / %	16 (12%)	39 (28%)	24 (17%)	35 (25%)	25 (18%)	139

(Chi-square value 29.785, df 4, sig .000*)

D4A

Rank #4 - Physical Therapist

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
20	3	0	3 (4%)	2%
19	3	0	3 (4%)	2%
18	4	2 (3%)	2 (3%)	3%
17	9	4 (6%)	5 (7%)	7%

Some Interest (Pile 4 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
16	8	3 (5%)	5 (7%)	6%
15	8	4 (6%)	4 (5%)	6%
14	14	4 (6%)	10 (14%)	10%
13	23	7 (11%)	16 (22%)	17%

No Interest (Pile 3 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
12	15	7 (11%)	8 (11%)	11%
11	13	7 (11%)	6 (8%)	9%
10	8	4 (6%)	4 (5%)	6%
9	9	5 (8%)	4 (5%)	7%

Some Dislike (Pile 2 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
8	10	7 (11%)	3 (4%)	7%
7	8	7 (11%)	1 (1%)	6%
6	2	2 (3%)	0	1%
5	2	2 (3%)	0	1%

Strong Dislike (Pile 1 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
4	0	0	0	0

Pearson Chi-Square Value 22.571, df 15, sig. 094

D4B

Vocational Card Sort Scores – Physical Therapist (Rank #4)

Frequency Table Series (sig. 00083)*

Physical Therapist Deck A Tasks	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	3 (5%)	15 (23%)	14 (22%)	24 (37%)	9 (14%)	65
Female	15 (20%)	19 (26%)	19 (26%)	19 (26%)	2 (3%)	74
Total / %	18 (13%)	34 (25%)	33 (24%)	43 (31%)	11 (8%)	139

(Chi-square value 13.739, df 4, sig .008)

Physical Therapist Deck B Workplace	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	7 (11%)	21 (32%)	15 (23%)	10 (15%)	12 (19%)	65
Female	27 (37%)	24 (32%)	8 (11%)	9 (12%)	6 (8%)	74
Total / %	34 (25%)	45 (32%)	23 (17%)	19 (14%)	18 (13%)	139

(Chi-square value 15.631, df 4, sig .004)

Physical Therapist Deck C Title	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	9 (14%)	12 (19%)	18 (28%)	20 (31%)	6 (9%)	65
Female	27 (37%)	30 (41%)	11 (15%)	4 (5%)	2 (3%)	74
Total / %	36 (26%)	42 (31%)	29 (21%)	24 (17%)	8 (6%)	139

(Chi-square value 30.616, df 4, sig .000*)

Physical Therapist Deck D Tools	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	8 (17%)	27 (42%)	1 (1%)	17 (26%)	11 (17%)	65
Female	6 (8%)	17 (28%)	0	24 (32%)	22 (30%)	74
Total / %	14 (10%)	44 (32%)	1 (1%)	41 (30%)	33 (24%)	139

(Chi-square value 10.548, df 4, sig .061)

D5A

Rank #5 – Registered Nurse

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
20	7	0	7 (10%)	5%
19	8	1 (1%)	7 (10%)	6%
18	7	1 (1%)	6 (8%)	5%
17	11	2 (3%)	9 (12%)	8%

Some Interest (Pile 4 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
16	9	0	9 (12%)	7%
15	7	1 (1%)	6 (8%)	5%
14	7	2 (3%)	5 (7%)	5%
13	9	2 (3%)	7 (10%)	6%

No Interest (Pile 3 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
12	9	5 (8%)	4 (5%)	7%
11	7	4 (6%)	3 (4%)	5%
10	12	9 (14%)	3 (4%)	9%
9	8	7 (11%)	1 (1%)	6%

Some Dislike (Pile 2 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
8	13	12 (19%)	1 (1%)	9%
7	8	5 (8%)	3 (4%)	6%
6	7	7 (11%)	0	5%
5	5	4 (6%)	1 (1%)	4%

Strong Dislike (Pile 1 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
4	5	3 (5%)	2 (3%)	3.6%

(Chi-square value 62.401, df 16, sig .000*)

D5B

Vocational Card Sort Scores – Registered Nurse (Rank #5)

Frequency Table Series (sig. 00083)*

Registered Nurse Deck A Tasks	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	3 (5%)	3 (5%)	20 (31%)	24 (37%)	15 (23%)	65
Female	22 (30%)	26 (35%)	12 (16%)	7 (10%)	7 (10%)	74
Total / %	25 (18%)	29 (21%)	32 (23%)	31 (22%)	22 (16%)	139

Chi-square value 46.525, df 4, sig. 000*

Registered Nurse Deck B Workplace	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	5 (8%)	9 (14%)	13 (20%)	19 (29%)	19 (29%)	65
Female	35 (47%)	24 (32%)	6 (8%)	4 (5%)	5 (7%)	74
Total / %	40 (29%)	33 (24%)	19 (14%)	23 (16%)	24 (17%)	139

Chi-square value 49.471, df 4, sig. 000*

Registered Nurse Deck C Title	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	1 (1%)	8 (12%)	17 (26%)	24 (37%)	15 (23%)	65
Female	29 (39%)	24 (32%)	8 (11%)	5 (7%)	8 (11%)	74
Total / %	30 (22%)	32 (23%)	25 (18%)	29 (21%)	23 (17%)	139

Chi-square value 51.586, df 4, sig. 000*

Registered Nurse Deck D Tools	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	1 (1%)	6 (9%)	22 (34%)	12 (18%)	24 (37%)	65
Female	13 (17%)	23 (31%)	16 (22%)	8 (11%)	14 (19%)	74
Total / %	14 (10%)	29 (21%)	38 (27%)	20 (14%)	38 (27%)	139

Chi-square value 24.149, df 4, sig. 000*

D6A

Rank #6 - Counseling Psychologist

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
20	2	0	2 (3%)	1%
19	4	1 (1%)	3 (4%)	3%
18	0	0	0	0
17	7	0	7 (10%)	5%

Some Interest (Pile 4 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
16	11	4 (6%)	7 (10%)	8%
15	6	1 (1%)	5 (7%)	4%
14	21	6 (9%)	15 (20%)	15%
13	14	8 (12%)	6 (8%)	10%

No Interest (Pile 3 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
12	13	7 (11%)	6 (8%)	9%
11	13	9 (14%)	4 (5%)	9%
10	19	9 (14%)	10 (14%)	14%
9	12	8 (12%)	4 (5%)	9%

Some Dislike (Pile 2 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
8	6	4 (6%)	2 (3%)	4%
7	4	3 (5%)	1 (1%)	3%
6	4	3 (5%)	1 (1%)	3%
5	2	2 (3%)	0	1%

Strong Dislike (Pile 1 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
4	2	0	1	1%

Pearson Chi-Square Value 26.277, df 15, sig. 036

D6B

Vocational Card Sort Scores – Counseling Psychologist (Rank #6)

Frequency Table Series (sig. 00083)*

Counseling Psychologist Deck A Tasks	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	3 (5%)	5 (8%)	22 (34%)	27 (42%)	8 (12%)	65
Female	18 (24%)	18 (24%)	22 (30%)	8 (11%)	7 (10%)	74
Total / %	21 (15%)	23 (17%)	44 (32%)	35 (25%)	15 (11%)	139

(Chi-square value 28.892, df 4, sig .000*)

Counseling Psychologist Deck B Workplace	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	4 (6%)	20 (31%)	21 (32%)	16 (25%)	4 (6%)	65
Female	19 (26%)	22 (30%)	19 (26%)	9 (12%)	5 (7%)	74
Total / %	23 (17%)	42 (30%)	40 (29%)	25 (18%)	9 (7%)	139

(Chi-square value 11.514, df 4, sig .021)

Counseling Psychologist Deck C Title	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	3 (5%)	10 (15%)	17 (26%)	21 (32%)	14 (22%)	65
Female	25 (34%)	17 (23%)	18 (24%)	8 (11%)	6 (8%)	74
Total / %	28 (20%)	27 (19%)	35 (25%)	29 (21%)	20 (14%)	139

(Chi-square value 27.690, df 4, sig .000*)

Counseling Psychologist Deck D Tools	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	4 (6%)	18 (28%)	18 (28%)	14 (22%)	11 (17%)	65
Female	6 (8%)	12 (16%)	19 (25%)	24 (32%)	12 (16%)	74
Total / %	10 (7%)	30 (22%)	37 (27%)	38 (27%)	23 (17%)	139

(Chi-square value 4.739, df 4, sig .449)

D7A

Rank #7 - Veterinary Technician

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
20	3	0	3 (4%)	2%
19	1	0	1 (1%)	1%
18	6	2 (3%)	4 (5%)	4%
17	8	2 (3%)	6 (8%)	6%

Some Interest (Pile 4 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
16	10	4 (6%)	6 (8%)	7%
15	8	4 (6%)	4 (5%)	6%
14	13	4 (6%)	9 (12%)	9%
13	10	4 (6%)	6 (8%)	7%

No Interest (Pile 3 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
12	15	7 (11%)	8 (11%)	11%
11	19	8 (12%)	11 (15%)	14%
10	10	9 (14%)	1 (1%)	7%
9	12	4 (6%)	8 (11%)	9%

Some Dislike (Pile 2 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
8	10	7 (11%)	3 (4%)	7%
7	5	2 (3%)	3 (4%)	4%
6	7	7 (11%)	0	5%
5	1	0	1 (1%)	1%

Strong Dislike (Pile 1 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
4	1	1 (1%)	0	1%

Pearson Chi-Square value 27.998, df.16, sig . 032

D7B

Vocational Card Sort Scores – Veterinary Technician (Rank #7)

Frequency Table Series (sig. 00083)*

Veterinary Technician Deck A Tasks	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	3 (5%)	16 (25%)	10 (15%)	22 (34%)	14 (22%)	65
Female	16 (22%)	23 (31%)	16 (22%)	13 (18%)	6 (8%)	74
Total / %	19 (14%)	39 (28%)	26 (19%)	35 (25%)	20 (14%)	139

(Chi-square value 16.537, df 4, sig .002)

Veterinary Technician Deck B Workplace	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	8 (12%)	18 (28%)	16 (25%)	17 (26%)	6 (9%)	65
Female	13 (18%)	27 (37%)	16 (22%)	11 (15%)	7 (10%)	74
Total / %	21 (15%)	45 (32%)	32 (23%)	28 (20%)	13 (9%)	139

(Chi-square value 3.786, df 4, sig .436)

Veterinary Technician Deck C Title	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	2 (3%)	13 (20%)	28 (43%)	14 (22%)	8 (12%)	65
Female	8 (11%)	27 (37%)	23 (31%)	12 (16%)	4 (5%)	74
Total / %	10 (7%)	40 (29%)	51 (37%)	26 (19%)	12 (9%)	139

(Chi-square value 9.936, df 4, sig .042)

Veterinary Technician Deck D Tools	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	3 (5%)	12 (19%)	14 (22%)	22 (34%)	14 (22%)	65
Female	9 (12%)	16 (22%)	19 (26%)	19 (26%)	11 (15%)	74
Total / %	12 (9%)	28 (20%)	33 (24%)	41 (30%)	25 (18%)	139

(Chi-square value 4.344, df 4, sig .361)

D8A

Rank #8 - Social Services / Human Services Assistant

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
20	0	0	0	0
19	3	1 (1%)	2 (3%)	2%
18	5	0	5 (7%)	4%
17	5	1 (1%)	4 (5%)	4%

Some Interest (Pile 4 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
16	7	1 (1%)	6 (8%)	5%
15	12	3 (5%)	9 (12%)	9%
14	14	6 (9%)	8 (11%)	10%
13	15	6 (9%)	9 (12%)	11%

No Interest (Pile 3 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
12	15	8 (12%)	7 (10%)	11%
11	15	9 (14%)	6 (8%)	11%
10	22	12 (19%)	10 (14%)	16%
9	5	3 (5%)	2 (3%)	4%

Some Dislike (Pile 2 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
8	12	6 (9%)	6 (8%)	9%
7	2	2 (3%)	0	1%
6	2	2 (3%)	0	1%
5	4	4 (6%)	0	3%

Strong Dislike (Pile 1 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
4	1	1 (1%)	0	1%

Pearson Chi-Square Value 24.158, df 15, sig .062

D8B

Vocational Card Sort Scores – Social Services / Human Services Assistant (Rank #8)

Frequency Table Series (sig. 00083)*

Social Services Deck A Tasks	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	2 (3%)	6 (9%)	20 (31%)	23 (35%)	14 (22%)	65
Female	10 (14%)	18 (24%)	25 (34%)	14 (19%)	7 (10%)	74
Total / %	12 (9%)	24 (18%)	45 (32%)	37 (27%)	26 (15%)	139

(Chi-square value 15.845, df 4, sig .003)

Social Services Deck B Workplace	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	6 (9%)	20 (31%)	12 (19%)	16 (25%)	11 (17%)	65
Female	27 (37%)	17 (23%)	14 (19%)	11 (15%)	5 (7%)	74
Total / %	33 (24%)	37 (27%)	26 (19%)	27 (19%)	16 (12%)	139

(Chi-square value 16.423, df 4, sig. 003)

Social Services Deck C Title	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	1 (1%)	6 (9%)	22 (34%)	18 (28%)	18 (28%)	65
Female	14 (19%)	25 (34%)	16 (22%)	10 (14%)	9 (12%)	74
Total / %	15 (11%)	31 (22%)	38 (27%)	28 (20%)	27 (19%)	139

(Chi-square value 28.682, df 4, sig .000^)

Social Services Deck D Tools	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	6 (9%)	22 (34%)	22 (34%)	9 (14%)	6 (9%)	65
Female	8 (11%)	18 (24%)	24 (32%)	15 (20%)	9 (12%)	74
Total / %	14 (10%)	40 (29%)	46 (33%)	24 (17%)	15 (11%)	139

(Chi-square value 2.300, df 4, sig .681)

D9A

Rank #9 - Radiological Technician

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
20	9	0	9 (12%)	7%
19	5	3 (5%)	2 (3%)	4%
18	6	0	6 (8%)	4%
17	5	1 (1%)	4 (5%)	4%

Some Interest (Pile 4 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
16	9	2 (3%)	7 (10%)	7%
15	7	2 (3%)	5 (7%)	5%
14	7	1 (1%)	6 (8%)	5%
13	12	7 (11%)	5 (7%)	9%

No Interest (Pile 3 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
12	6	2 (3%)	4 (5%)	4%
11	12	6 (9%)	6 (8%)	9%
10	12	6 (9%)	6 (8%)	8%
9	14	8 (12%)	6 (8%)	10%

Some Dislike (Pile 2 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
8	9	7 (11%)	2 (3%)	7%
7	11	7 (11%)	4 (5%)	8%
6	9	8 (12%)	1 (1%)	7%
5	6	5 (8%)	1 (1%)	4%

Strong Dislike (Pile 1 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
4	0	0	0	0

Pearson Chi-Square value 37.201, df 15, sig .001

D9B

Vocational Card Sort Scores – Radiological Technician (Rank #9)

Frequency Table Series (sig. 00083)*

Radiological Technician Deck A Tasks	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	3 (4%)	12 (19%)	10 (15%)	23 (35%)	18 (28%)	65
Female	19 (26%)	18 (24%)	16 (22%)	16 (22%)	5 (7%)	74
Total / %	21 (15%)	30 (22%)	26 (19%)	39 (28%)	23 (17%)	139

(Chi-square value 24.471, df 4, sig .000*)

Radiological Technician Deck B Workplace	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	3 (5%)	15 (23%)	14 (22%)	16 (25%)	17 (26%)	65
Female	18 (24%)	22 (25%)	13 (18%)	14 (18%)	7 (10%)	74
Total / %	21 (15%)	37 (27%)	27 (19%)	36 (22%)	24 (17%)	139

(Chi-square value 15.859, df 4, sig .003)

Radiological Technician Deck C Title	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	3 (5%)	10 (15%)	17 (26%)	25 (39%)	10 (15%)	65
Female	13 (18%)	20 (27%)	21 (28%)	12 (16%)	8 (11%)	74
Total / %	16 (12%)	30 (22%)	38 (27%)	37 (27%)	18 (13%)	139

(Chi-square value 14.271, df 4, sig .006)

Radiological Technician Deck D Tools	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	2 (3%)	10 (15%)	16 (25%)	22 (34%)	15 (23%)	65
Female	20 (27%)	28 (38%)	11 (14%)	8 (11%)	7 (10%)	74
Total / %	22 (16%)	38 (27%)	27 (19%)	30 (22%)	22 (16%)	139

(Chi-square value 33.178, df 4, sig .000*)

D10A

Rank #10 - Chef or Head Cook

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
20	12	6 (9%)	6 (8%)	9%
19	1	1 (1%)	0	1%
18	2	2 (3%)	0	1%
17	10	3 (5%)	7 (10%)	7%

Some Interest (Pile 4 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
16	14	5 (8%)	9 (12%)	10%
15	5	4 (6%)	1 (1%)	4%
14	12	4 (6%)	8 (11%)	9%
13	4	2 (3%)	2 (3%)	3%

No Interest (Pile 3 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
12	9	4 (6%)	5 (7%)	7%
11	12	6 (9%)	6 (8%)	9%
10	8	2 (3%)	6 (8%)	6%
9	9	4 (6%)	5 (7%)	7%

Some Dislike (Pile 2 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
8	7	5 (8%)	2 (3%)	5%
7	13	6 (9%)	7 (10%)	9%
6	7	4 (6%)	3 (4%)	5%
5	10	6 (9%)	4 (5%)	7%

Strong Dislike (Pile 1 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
4	4	2 (1%)	2 (1%)	3%

Pearson Chi-Square value 13.812, df 17, sig .680

D10B

Vocational Card Sort Scores – Chef / Head Cook (Rank #10)

Frequency Table Series (sig. 00083)*

Chef / Head Cook Deck A Tasks	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	8 (12%)	18 (28%)	9 (14%)	19 (29%)	11 (11%)	65
Female	10 (14%)	20 (27%)	20 (27%)	11 (15 %)	13 (18%)	74
Total / %	18 (13%)	38 (27%)	29 (21%)	30 (22%)	24 (17%)	139

(Chi-square value 6.243, df 4, sig .182)

Chef / Head Cook Deck B Workplace	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	8 (12%)	11 (17%)	16 (25%)	16 (25%)	14 (22%)	65
Female	6 (8%)	23 (31%)	18 (24%)	18 (24%)	9 (12%)	74
Total / %	14 (10%)	34 (25%)	34 (25%)	34 (25%)	23 (17%)	139

(Chi-square value 5.283, df 4, sig .280)

Chef / Head Cook Deck C Title	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	8 (12%)	14 (22%)	15 (23%)	17 (26%)	11 (17%)	65
Female	9 (12%)	19 (26%)	25 (34%)	12 (16%)	9 (12%)	74
Total / %	17 (12%)	33 (24%)	40 (29%)	29 (21%)	20 (14%)	139

(Chi-square value 3.812, df 4, sig .432)

Chef / Head Cook Deck D Tools	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	11 (17%)	18 (28%)	16 (25%)	10 (15%)	11 (17%)	65
Female	10 (14%)	20 (27%)	19 (26%)	10 (14%)	15 (20%)	74
Total / %	20 (14%)	38 (27%)	35 (25%)	20 (14%)	26 (19%)	139

(Chi-square value .347, df 4, sig .983)

D11A

Rank #11 - Security Guard

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
20	7	6 (9%)	1 (1%)	5%
19	1	0	1 (1%)	1%
18	4	3 (5%)	1 (1%)	3%
17	8	5 (8%)	3 (4%)	6%

Some Interest (Pile 4 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
16	10	6 (9%)	4 (5%)	7%
15	10	8 (12%)	2 (3%)	7%
14	9	6 (9%)	3 (4%)	7%
13	13	8 (12%)	5 (7%)	9%

No Interest (Pile 3 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
12	11	3 (5%)	8 (11%)	8%
11	14	3 (5%)	11 (15%)	10%
10	8	3 (5%)	5 (7%)	6%
9	7	4 (6%)	3 (4%)	5%

Some Dislike (Pile 2 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
8	7	4 (6%)	3 (4%)	5%
7	9	3 (5%)	6 (8%)	7%
6	10	1 (1%)	9 (12%)	7%
5	6	1 (1%)	5 (7%)	4%

Strong Dislike (Pile 1 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
4	5	1 (1%)	4 (6%)	4%

Pearson Chi-Square value 31.008, df17, sig .020

D11B

Vocational Card Sort Scores – Security Guard (Rank #11)

Frequency Table Series (sig. 00083)*

Security Guard Deck A Tasks	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	14 (22%)	19 (24%)	13 (20%)	8 (12%)	11 (17%)	65
Female	8 (11%)	15 (20%)	12 (16%)	15 (20%)	24 (32%)	74
Total / %	22 (16%)	34 (25%)	25 (18%)	23 (17%)	35 (26%)	139

(Chi-square value 8.539, df 4, sig .073)

Security Guard Deck B Workplace	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	8 (12%)	16 (25%)	19 (30%)	9 (14%)	13 (20%)	65
Female	4 (5%)	8 (11%)	21 (28%)	23 (31%)	18 (24%)	74
Total / %	12 (9%)	24 (17%)	40 (29%)	32 (24%)	31 (22%)	139

(Chi-square value 10.493, df 4, sig .033)

Security Guard Deck C Title	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	11 (17%)	22 (34%)	20 (31%)	6 (9%)	6 (9%)	65
Female	2 (3%)	11 (15%)	18 (24%)	14 (19%)	29 (40%)	74
Total / %	13 (9%)	33 (24%)	38 (27%)	20 (14%)	35 (25%)	139

(Chi-square value 27.851, df 4, sig .000*)

Security Guard Deck D Tools	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	24 (37%)	17 (26%)	8 (12%)	11 (17%)	5 (8%)	65
Female	10 (14%)	26 (36%)	12 (16%)	17 (23%)	9 (12%)	74
Total / %	34 (25%)	43 (31%)	20 (14%)	28 (20%)	14 (10%)	139

(Chi-square value 10.338, df 4, sig .035)

D12A

Rank #12 - Public School Teacher

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
20	8	1 (1%)	7 (10%)	6%
19	7	2 (3%)	5 (7%)	5%
18	3	1 (1%)	2 (3%)	2%
17	5	3 (5%)	2 (3%)	4%

Some Interest (Pile 4 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
16	11	1 (1%)	10 (14%)	8%
15	11	7 (11%)	4 (5%)	8%
14	9	5 (8%)	4 (5%)	7%
13	7	3 (5%)	4 (5%)	5%

No Interest (Pile 3 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
12	4	1 (1%)	3 (4%)	3%
11	8	7 (11%)	1 (1%)	6%
10	13	6 (9%)	7 (10%)	9%
9	12	4 (6%)	8 (11%)	9%

Some Dislike (Pile 2 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
8	9	4 (6%)	5 (7%)	7%
7	8	5 (8%)	3 (4%)	6%
6	12	8 (12%)	4 (5%)	9%
5	5	2 (3%)	3 (4%)	4%

Strong Dislike (Pile 1 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
4	7	5 (8%)	2 (3%)	5%

Pearson Chi-Square value 24.616, df16, sig .077

D12B

Vocational Card Sort Scores – Public School Teacher (Rank #12)

Frequency Table Distribution Series (sig. 00083)*

School Teacher Deck A Tasks	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	2 (3%)	20 (31%)	7 (11%)	17 (26%)	19 (29%)	65
Female	21 (28%)	15 (20%)	12 (16%)	10 (14 %)	16 (22%)	74
Total / %	23 (17%)	35 (25%)	19 (14%)	27 (19%)	35 (25%)	139

(Chi-square value 19.296, df 4, sig .000*)

School Teacher Deck B Workplace	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	6 (9%)	10 (15%)	15 (23%)	13 (20%)	21 (32%)	65
Female	20 (27%)	14 (19%)	13 (18%)	11 (15%)	16 (22%)	74
Total / %	26 (19%)	24 (17%)	28 (20%)	24 (17%)	37 (27%)	139

(Chi-square value 8.644,df 4, sig .071)

School Teacher Deck C Title	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	7 (11%)	19 (27%)	11 (17%)	4 (6%)	24 (37%)	65
Female	17 (23%)	21 (28%)	13 (18%)	11 (15%)	12 (16%)	74
Total / %	24 (17%)	40 (29%)	24 (17%)	15 (11%)	36 (26%)	139

(Chi-square value 11.164 df 4, sig .024)

School Teacher Deck D Tools	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	7 (11%)	14 (22%)	17 (26%)	16 (25%)	11 (17%)	65
Female	11 (15%)	18 (24%)	19 (26%)	8 (11%)	18 (24%)	74
Total / %	18 (13%)	32 (23%)	36 (26%)	24 (17%)	29 (21%)	139

(Chi-square value 5.296, df 4, sig .258)

D13A

Rank #13 - E.M.T. / Paramedic

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
20	3	0	3 (4%)	2%
19	6	0	6 (8%)	4%
18	7	1 (1%)	6 (8%)	6%
17	7	3 (4%)	4 (5%)	5%

Some Interest (Pile 4 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
16	5	0	5 (4%)	4%
15	9	2 (3%)	7 (10%)	6%
14	7	3 (5%)	4 (5%)	5%
13	10	5 (8%)	5 (7%)	7%

No Interest (Pile 3 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
12	12	6 (9%)	6 (8%)	9%
11	13	9 (14%)	4 (5%)	9%
10	9	5 (8%)	4 (5%)	7%
9	11	5 (8%)	6 (8%)	8%

Some Dislike (Pile 2 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
8	9	6 (9%)	3 (4%)	7%
7	16	8 (12%)	8 (11%)	12%
6	7	5 (8%)	2 (3%)	5%
5	3	2 (3%)	1 (1%)	2%

Strong Dislike (Pile 1 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
4	5	5 (8%)	0	4%

Pearson Chi-Square value 29.922, df 17, sig .027

D13B

Vocational Card Sort Scores – E.M.T. / Paramedic (Rank #13)

Frequency Table Distribution Series (sig. 00083)*

E.M.T. / Paramedic Deck A Tasks	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	4 (6%)	8 (12%)	19 (29%)	18 (28%)	16 (25%)	65
Female	18 (24%)	21 (28%)	15 (20%)	14 (19 %)	6 (8%)	74
Total / %	22 (16%)	29 (21%)	34 (25%)	32 (23%)	22 (16%)	139

(Chi-square value 19.753, df 4, sig .001)

E.M.T. / Paramedic Deck B Workplace	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	2 (3%)	13 (20%)	20 (31%)	13 (20%)	17 (26%)	65
Female	11 (15%)	18 (24%)	19 (26%)	17 (23%)	9 (12%)	74
Total / %	13 (9%)	31 (22%)	39 (28%)	30 (22%)	26 (19%)	139

(Chi-square value 9.515, df 4, sig .049)

E.M.T. / Paramedic Deck C Title	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	3 (5%)	9 (14%)	21 (32%)	18 (28%)	14 (22%)	65
Female	13 (18%)	20 (27%)	22 (30%)	9 (12%)	10 (14%)	74
Total / %	16 (12%)	29 (21%)	43 (31%)	27 (19%)	24 (17%)	139

(Chi-square value 13.587, df 4, sig .009)

E.M.T. / Paramedic Deck D Tools	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	3 (5%)	8 (12%)	15 (23%)	22 (34%)	17 (26%)	65
Female	17 (23%)	20 (28%)	15 (27%)	12 (16%)	10 (14%)	74
Total / %	20 (14%)	28 (20%)	30 (22%)	34 (25%)	27 (19%)	139

(Chi-square value 19.197, df 4, sig .001)

D14A

Rank #14th - Pharmacy Technician*Frequency Distribution of Total Occupational Interest Scores (sig. 00083*)*

Strong Interest (Pile 5 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
20	3	0	3 (4%)	2%
19	1	0	1 (1%)	1%
18	2	1 (1%)	1 (1%)	1%
17	9	2 (3%)	7 (10%)	7%

Some Interest (Pile 4 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
16	8	2 (3%)	6 (8%)	6%
15	8	2 (3%)	6 (8%)	6%
14	14	3 (5%)	11 (15%)	12%
13	15	4 (6%)	11 (15%)	11%

No Interest (Pile 3 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
12	12	4 (6%)	8 (11%)	9%
11	10	3 (5%)	7 (10%)	7%
10	10	7 (11%)	3 (4%)	7%
9	9	6 (4%)	3 (4%)	7%

Some Dislike (Pile 2 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
8	12	10 (15%)	2 (3%)	8%
7	10	8 (12%)	2 (3%)	7%
6	7	5 (8%)	2 (3%)	5%
5	5	5 (8%)	0	4%

Strong Dislike (Pile 1 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
4	4	3 (5%)	1 (1%)	3%

Chi-square value 42.966, df 16, sig .001

D14B

Vocational Card Sort Scores – Pharmacy Technician (Rank #14)

Frequency Table Distribution Series (sig. 00083)*

Pharmacy Technician Deck A Tasks	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	6 (9%)	7 (11%)	11 (17%)	22 (34%)	19 (29%)	65
Female	19 (26%)	28 (38%)	11 (15%)	9 (12 %)	7 (10%)	74
Total / %	25 (18%)	35 (25%)	22 (16%)	31 (22%)	26 (19%)	139

(Chi-square value 29.893, df 4, sig .000*)

Pharmacy Technician Deck B Workplace	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	2 (3%)	8 (12%)	12 (19%)	26 (40%)	17 (26%)	65
Female	21 (28%)	32 (43%)	12 (16%)	3 (4%)	5 (7%)	74
Total / %	23 (17%)	40 (29%)	24 (17%)	29 (21%)	22 (16%)	139

(Chi-square value 55.533, df 4, sig .000*)

Pharmacy Technician Deck C Title	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	6 (9%)	8 (12%)	18 (28%)	18 (28%)	15 (23%)	65
Female	20 (27%)	25 (34%)	18 (24%)	6 (8%)	5 (7%)	74
Total / %	26 (19%)	33 (24%)	36 (26%)	24 (17%)	20 (14%)	139

(Chi-square value 26.828 df 4, sig .000*)

Pharmacy Technician Deck D Tools	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	4 (6%)	7 (11%)	16 (25%)	20 (31%)	17 (26%)	65
Female	6 (8%)	5 (7%)	12 (16%)	25 (34%)	25 (34%)	74
Total / %	10 (7%)	12 (9%)	28 (20%)	45 (32%)	42 (30%)	139

(Chi-square value 4.802, df 4, sig .567)

D15A

Rank #15 - Lawyer

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
20	0	0	0	0
19	3	1 (1%)	2 (3%)	2%
18	7	2 (3%)	5 (7%)	5%
17	4	0	4 (5%)	3%

Some Interest (Pile 4 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
16	7	1 (1%)	6 (8%)	5%
15	11	3 (5%)	8 (11%)	8%
14	9	6 (9%)	3 (4%)	7%
13	11	2 (3%)	9 (12%)	8%

No Interest (Pile 3 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
12	9	6 (9%)	3 (4%)	7%
11	18	8 (12%)	10 (14%)	13%
10	14	6 (9%)	8 (11%)	10%
9	15	9 (14%)	6 (8%)	11%

Some Dislike (Pile 2 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
8	10	6 (9%)	4 (5%)	7%
7	12	7 (11%)	5 (7%)	9%
6	4	4 (6%)	0	3%
5	1	1 (1%)	0	1%

Strong Dislike (Pile 1 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
4	4	3 (5%)	1(1%)	3%

Pearson Chi-Square value 28.295, df 16, sig .029

D15B

Vocational Card Sort Scores – Lawyer (Rank #15)

Frequency Table Distribution Series (sig. 00083)*

Lawyer	5	4	3	2	1	
Deck A Tasks	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	3 (5%)	14 (22%)	12 (19%)	21 (32%)	15 (23%)	65
Female	14 (19%)	18 (24%)	17 (23%)	16 (22 %)	9 (12%)	74
Total / %	17 (12%)	32 (25%)	29 (21%)	37 (27%)	24 (17%)	139

(Chi-square value 10.115, df 4, sig .039)

Lawyer	5	4	3	2	1	
Deck B Workplace	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	2 (3%)	12 (19%)	18 (28%)	16 (25%)	17 (26%)	65
Female	11 (15%)	25 (34%)	21 (28%)	9 (12%)	8 (11%)	74
Total / %	13 (9%)	37 (27%)	39 (28%)	25 (19%)	25 (18%)	139

(Chi-square value 15.712, df 4, sig .003)

Lawyer	5	4	3	2	1	
Deck C Title	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	3 (5%)	17 (26%)	16 (25%)	11 (17%)	18 (28%)	65
Female	14 (19%)	26 (35%)	12 (16%)	16 (22%)	6 (8%)	74
Total / %	17 (12%)	43 (31%)	28 (20%)	27 (19%)	24 (17%)	139

(Chi-square value 16.116, df 4, sig .007)

Lawyer	5	4	3	2	1	
Deck D Tools	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	5 (8%)	10 (15%)	16 (25%)	21 (32%)	13 (20%)	65
Female	7 (10%)	14 (19%)	24 (33%)	14 (19%)	15 (20%)	74
Total / %	12 (9%)	24 (17%)	40 (29%)	35 (25%)	28 (20%)	139

(Chi-square value 4.234, df 4, sig .516)

D16A

Rank #16 - Chiropractor

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
20	2	0	2 (3%)	1%
19	1	0	1 (1%)	1%
18	4	0	4 (5%)	3%
17	4	0	4 (5%)	3%

Some Interest (Pile 4 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
16	7	1 (1%)	6 (8%)	5%
15	7	2 (3%)	5 (7%)	5%
14	14	5 (8%)	9 (12%)	10%
13	11	3 (5%)	8 (11%)	8%

No Interest (Pile 3 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
12	13	4 (6%)	9 (12%)	9%
11	18	9 (14%)	9 (12%)	13%
10	18	9 (14%)	9 (12%)	13%
9	13	7 (11%)	6 (8%)	9%

Some Dislike (Pile 2 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
8	8	7 (11%)	1 (1%)	6%
7	5	5 (8%)	0	4%
6	11	10 (15%)		8%
5	2	2 (3%)	0	1%

Strong Dislike (Pile 1 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
4	1	1 (1%)	0	1%

Chi-square value 40.724, df 16, sig .001

D16B

Vocational Card Sort Scores – Chiropractor (Rank #16)

Frequency Table Distribution Series (sig. 00083)*

Chiropractor	5	4	3	2	1	
Deck A Tasks	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	2 (3%)	6 (9%)	17 (26%)	26 (40%)	14 (22%)	65
Female	14 (19%)	23 (31%)	19 (26%)	10 (16%)	6 (8%)	74
Total / %	16 (12%)	29 (21%)	36 (26%)	38 (27%)	20 (14%)	139

(Chi-square value 26.965, df 4, sig .000*)

Chiropractor	5	4	3	2	1	
Deck B Workplace	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	2 (3%)	6 (9%)	14 (22%)	22 (34%)	21 (32%)	65
Female	21 (28%)	22 (30%)	18 (24%)	7 (10%)	6 (8%)	74
Total / %	23 (17%)	25 (20%)	32 (23%)	29 (21%)	27 (19%)	139

(Chi-square value 41.020, df 4, sig .000*)

Chiropractor	5	4	3	2	1	
Deck C Title	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	6 (9%)	15 (23%)	14 (22%)	22 (34%)	8 (12%)	65
Female	14 (19%)	30 (41%)	16 (22%)	8 (11%)	6 (8%)	74
Total / %	20 (14%)	45 (32%)	30 (22%)	30 (22%)	14 (10%)	139

(Chi-square value 14.631, df 4, sig .006)

Chiropractor	5	4	3	2	1	
Deck D Tools	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	1 (1%)	4 (6%)	18 (28%)	26 (40%)	16 (25%)	65
Female	6 (8%)	7 (10%)	26 (35%)	21 (28%)	14 (19%)	74
Total / %	7 (5%)	11 (8%)	44 (32%)	47 (34%)	30 (22%)	139

(Chi-square value 5.952, df 4, sig .203)

D17A

Rank #17 – Medical Records Health Information Technician

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
20	2	0	2 (3%)	1%
19	2	0	2 (3%)	1%
18	6	1 (1%)	5 (7%)	4%
17	6	0	6 (8%)	4%

Some Interest (Pile 4 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
16	14	3 (5%)	11 (15%)	10%
15	10	1 (1%)	9 (12%)	7%
14	4	0	4 (5%)	3%
13	7	1 (1%)	6 (8%)	5%

No Interest (Pile 3 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
12	11	4 (6%)	7 (9%)	8%
11	15	9 (14%)	6 (8%)	11%
10	11	6 (9%)	5 (7%)	8%
9	10	9 (14%)	1 (1%)	7%

Some Dislike (Pile 2 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
8	13	7 (11%)	6 (8%)	9%
7	8	5 (8%)	3 (4%)	6%
6	13	13 (20%)	0	9%
5	5	4 (6%)	1 (1%)	4%

Strong Dislike (Pile 1 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
4	2	2 (3%)	0	1%

Chi-square value 56.148, df 16, asymp sig. (2-sided) .000*

D17B

Vocational Card Sort Scores – Medical Records Health Information Tech. (Rank #17)

Frequency Table Distribution Series (sig. 00083)

Medical Records Deck A Tasks	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	0	6 (9%)	19 (29%)	19 (29%)	21 (32%)	65
Female	15 (20%)	30 (40%)	15 (20%)	11 (15%)	3 (4%)	74
Total / %	15 (11%)	36 (26%)	34 (25%)	30 (22%)	24 (17%)	139

(Chi-square value 46.717, df 4, sig .000)*

Medical Records Deck B Workplace	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	4 (6%)	4 (6%)	17 (26%)	24 (37%)	16 (25%)	65
Female	16 (21%)	32 (43%)	13 (18%)	9 (12%)	4 (5%)	74
Total / %	20 (14%)	36 (26%)	30 (22%)	33 (24%)	20 (14%)	139

(Chi-square value 43.127, df 4, sig .000*)

Medical Records Deck C Title	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	2 (3%)	4 (6%)	20 (31%)	23 (35%)	16 (25%)	65
Female	12 (16%)	27 (36%)	17 (24%)	12 (16%)	6 (8%)	74
Total / %	14 (10%)	31 (22%)	37 (27%)	35 (25%)	22 (16%)	139

(Chi-square value 32.005, df 4, sig .000*)

Medical Records Deck D Tools	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	0	3 (5%)	19 (29%)	28 (43%)	15 (23%)	65
Female	8 (11%)	17 (23%)	22 (30%)	14 (19%)	13 (18%)	74
Total / %	8 (6%)	20 (14%)	41 (30%)	42 (30%)	28 (20%)	139

(Chi-square value 22.340, df 4, sig .000*)

D18A

Rank #18 - Dietician or Nutritionist

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
20	2	0	2 (3%)	1%
19	0	0	0	0
18	5	1 (1%)	4 (5%)	4%
17	2	0	2 (3%)	1%

Some Interest (Pile 4 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
16	8	3 (5%)	5 (7%)	6%
15	11	4 (6%)	7 (10%)	8%
14	10	2 (3%)	8 (11%)	7%
13	14	4 (6%)	10 (14%)	10%

No Interest (Pile 3 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
12	15	4 (6%)	11 (15%)	11%
11	17	10 (15%)	7 (10%)	12%
10	11	7 (11%)	4 (5%)	8%
9	13	9 (14%)	4 (5%)	9%

Some Dislike (Pile 2 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
8	6	4 (6%)	2 (3%)	4%
7	7	4 (6%)	3 (4%)	5%
6	14	9 (14%)	5 (7%)	10%
5	3	3 (5%)	0	2%

Strong Dislike (Pile 1 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
4	1	1 (1%)	0	1%

Chi-square value 25.303, df15, sig .046

D18B

Vocational Card Sort Scores – Dietician / Nutritionist (Rank #18)

Frequency Table Distribution Series (sig. 00083)*

Dietician / Nutritionist Deck A Tasks	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	5 (8%)	9 (14%)	14 (22%)	24 (37%)	13 (20%)	65
Female	6 (8%)	23 (31%)	23 (31%)	15 (21%)	7 (10%)	74
Total / %	11 (8%)	32 (23%)	37 (27%)	39 (28%)	20 (14%)	139

(Chi-square value 11.749, df 4, sig .019)

Dietician / Nutritionist Deck B Workplace	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	4 (6%)	11 (17%)	16 (25%)	14 (22%)	20 (31%)	65
Female	8 (11%)	10 (14%)	30 (41%)	14 (19%)	12 (16%)	74
Total / %	12 (9%)	21 (15%)	46 (33%)	28 (20%)	32 (23%)	139

(Chi-square value 7.084, df 4, sig .131)

Dietician / Nutritionist Deck C Title	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	4 (6%)	6 (9%)	18 (28%)	26 (40%)	11 (16%)	65
Female	10 (14%)	24 (32%)	28 (38%)	9 (12%)	3 (4%)	74
Total / %	14 (10%)	30 (22%)	46 (33%)	35 (25%)	14 (10%)	139

(Chi-square value 23.908, df 4, sig .000*)

Dietician / Nutritionist Deck D Tools	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	5 (8%)	7 (11%)	20 (31%)	17 (26%)	16 (25%)	65
Female	15 (20%)	20 (27%)	15 (20%)	12 (16%)	12 (16%)	74
Total / %	20 (14%)	27 (19%)	35 (25%)	29 (21%)	28 (20%)	139

(Chi-square value 12.878, df 4, sig .012)

D19A

Rank #19 - Cartographer / Photogrammetrist

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
20	1	1 (1%)	0	1%
19	1	0	1 (1%)	1%
18	4	3 (5%)	1 (1%)	3%
17	4	1 (1%)	3 (4%)	3%

Some Interest (Pile 4 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
16	10	5 (8%)	5 (7%)	7%
15	4	1 (1%)	3 (4%)	3%
14	12	7 (11%)	5 (7%)	9%
13	7	5 (8%)	2 (3%)	5%

No Interest (Pile 3 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
12	24	12 (19%)	12 (19%)	17%
11	16	7 (11%)	9 (12%)	12%
10	13	8 (12%)	5 (7%)	9%
9	14	4 (6%)	10 (14%)	10%

Some Dislike (Pile 2 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
8	9	4 (6%)	5 (7%)	7%
7	7	1 (1%)	6 (8%)	5%
6	9	4 (6%)	5 (7%)	7%
5	2	1 (1%)	1 (1%)	1%

Strong Dislike (Pile 1 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
4	2	1 (1%)	1 (1%)	1%

Chi-square value 15.408, df 17, sig .566

D19B

Vocational Card Sort Scores – Cartographer / Photogrammetrist (Rank #19)

Frequency Table Distribution Series (sig. 00083)*

Cartographer	5	4	3	2	1	
Deck A Tasks	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	5 (8%)	9 (14%)	24 (37%)	21 (32%)	6 (9%)	65
Female	3 (4%)	5 (7%)	18 (24%)	25 (34%)	23 (31%)	74
Total / %	8 (6%)	14 (10%)	42 (30%)	46 (33%)	29 (21%)	139

(Chi-square value 12.282, df 4, sig .015)

Cartographer	5	4	3	2	1	
Deck B Workplace	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	7 (11%)	22 (34%)	14 (22%)	15 (23%)	7 (11%)	65
Female	8 (11%)	19 (26%)	19 (26%)	19 (26%)	8 (12%)	74
Total / %	15 (11%)	41 (30%)	33 (24%)	34 (25%)	15 (11%)	139

(Chi-square value 1.121, df 4, sig .891)

Cartographer	5	4	3	2	1	
Deck C Title	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	4 (6%)	10 (15%)	21 (32%)	18 (28%)	12 (19%)	65
Female	2 (3%)	12 (16%)	29 (39%)	22 (30%)	9 (12%)	74
Total / %	6 (4%)	22 (16%)	50 (36%)	40 (29%)	21 (15%)	139

(Chi-square value 2.384, df 4, sig .665)

Cartographer	5	4	3	2	1	
Deck D Tools	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	11 (17%)	18 (28%)	13 (20%)	15 (23%)	8 (12%)	65
Female	13 (18%)	21 (28%)	20 (27%)	12 (16%)	8 (11%)	74
Total / %	24 (17%)	39 (28%)	33 (24%)	27 (19%)	16 (12%)	139

(Chi-square value 1.640, df 4, sig .802)

D20A

Rank #20 - Carpenter

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
20	5	5 (8%)	0	4%
19	8	8 (12%)	0	6%
18	7	6 (9%)	1 (1%)	5%
17	2	3%	0	1%

Some Interest (Pile 4 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
16	11	8 (12%)	3 (4%)	8%
15	8	5 (8%)	3 (4%)	6%
14	5	1 (1%)	4 (5%)	4%
13	4	3 (5%)	1 (1%)	3%

No Interest (Pile 3 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
12	8	4 (6%)	4 (5%)	6%
11	12	5 (8%)	7 (10%)	9%
10	12	5 (8%)	7 (10%)	9%
9	9	4 (6%)	5 (7%)	7%

Some Dislike (Pile 2 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
8	8	2 (3%)	6 (8%)	6%
7	13	3 (5%)	10 (14%)	9%
6	11	2 (3%)	9 (12%)	8%
5	9	1 (1%)	8 (11%)	7%

Strong Dislike (Pile 1 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
4	7	1 (1%)	6 (8%)	5%

Chi-square value 43.762, df 16, sig.000*

D20B

Vocational Card Sort Scores – Carpenter (Rank #20)

Frequency Table Distribution Series (sig. 00083)*

Carpenter	5	4	3	2	1	
Deck A Tasks	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	16 (25%)	19 (29%)	11 (17%)	12 (19%)	7 (11%)	65
Female	0	8 (11%)	17 (23%)	16 (22%)	33 (45%)	74
Total / %	16 (12%)	27 (19%)	28 (20%)	28 (20%)	40 (29%)	139

(Chi-square value 38.819, df 4, sig .000*)

Carpenter	5	4	3	2	1	
Deck B Workplace	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	14 (22%)	22 (34%)	16 (25%)	6 (9%)	7 (11%)	65
Female	8 (11%)	16 (22%)	16 (22%)	18 (24%)	16 (22%)	74
Total / %	22 (16%)	38 (27%)	32 (23%)	24 (17%)	23 (17%)	139

(Chi-square value 11.571, df 4, sig .021)

Carpenter	5	4	3	2	1	
Deck C Title	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	20 (31%)	14 (22%)	11 (17%)	15 (23%)	5 (8%)	65
Female	1 (1%)	8 (11%)	16 (22%)	15 (20%)	34 (46%)	74
Total / %	21 (15%)	22 (16%)	27 (19%)	30 (22%)	39 (28%)	139

(Chi-square value 40.906, df 4, sig .000*)

Carpenter	5	4	3	2	1	
Deck D Tools	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	22 (34%)	15 (23%)	8 (12%)	14 (22%)	6 (9%)	65
Female	2 (3%)	11 (15%)	11 (15%)	19 (26%)	31 (42%)	74
Total / %	24 (17%)	26 (19%)	19 (14%)	33 (24%)	37 (27%)	139

(Chi-square value 34.969, df 4, sig .000*)

D21A

Rank #21 - Dental Hygienist

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
20	5	0	5 (7%)	4%
19	6	1 (1%)	5 (7%)	14%
18	4	1 (1%)	3 (4%)	3%
17	4	0	4 (5%)	3%

Some Interest (Pile 4 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
16	20	4 (6%)	16 (22%)	14%
15	3	1 (1%)	2 (3%)	2%
14	5	0	5 (7%)	4%
13	7	4 (6%)	3 (4%)	5%

No Interest (Pile 3 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
12	10	2 (3%)	8 (11%)	7%
11	9	5 (8%)	4 (5%)	7%
10	8	6 (9%)	2 (3%)	6%
9	11	5 (8%)	6 (8%)	8%

Some Dislike (Pile 2 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
8	12	9 (14%)	3 (4%)	9%
7	4	3 (5%)	1 (1%)	3%
6	12	9 (14%)	3 (4%)	9%
5	7	7 (11%)	0	5%

Strong Dislike (Pile 1 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
4	12	8 (12%)	4 (5%)	9%

Chi-square value 46.089, df 16, sig .000*

D21B

Vocational Card Sort Scores – Dental Hygienist (Rank #21)

Frequency Table Distribution Series (sig. 00083)*

Dental Hygienist Deck A Tasks	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	2 (3%)	11 (17%)	12 (19%)	19 (29%)	21 (32%)	65
Female	14 (19%)	24 (32%)	20 (27%)	9 (12%)	7 (10%)	74
Total / %	16 (12%)	35 (25%)	32 (24%)	28 (20%)	28 (20%)	139

(Chi-square value 25.926, df 4, sig .000*)

Dental Hygienist Deck B Workplace	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	2 (3%)	8 (12%)	16 (25%)	21 (32%)	18 (22%)	65
Female	14 (19%)	24 (32%)	12 (16%)	17 (23%)	7 (10%)	74
Total / %	16 (12%)	32 (23%)	28 (20%)	38 (27%)	25 (18%)	139

(Chi-square value 22.343, df 4, sig .000*)

Dental Hygienist Deck C Title	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	2 (3%)	7 (11%)	14 (22%)	19 (29%)	23 (35%)	65
Female	10 (14%)	31 (42%)	14 (19%)	9 (12%)	10 (14%)	74
Total / %	12 (9%)	38 (27%)	28 (20%)	28 (20%)	33 (24%)	139

(Chi-square value 28.722, df 4, sig .000*)

Dental Hygienist Deck D Tools	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	1 (1%)	6 (9%)	8 (12%)	23 (35%)	27 (42%)	65
Female	17 (23%)	23 (31%)	17 (23%)	9 (12%)	8 (11%)	74
Total / %	18 (13%)	29 (21%)	25 (18%)	32 (23%)	35 (25%)	139

(Chi-square value 43.467, df 4, sig .000*)

D22A

Chief Executive Officer - Rank #22

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
20	1	1 (1%)	0	1%
19	0	0	0	0
18	2	0	2 (3%)	1%
17	3	1 (1%)	2 (3%)	2%

Some Interest (Pile 4 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
16	5	2 (3%)	3 (4%)	4%
15	8	3 (5%)	5 (7%)	6%
14	8	3 (5%)	5 (7%)	6%
13	23	12 (19%)	11 (15%)	17%

No Interest (Pile 3 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
12	10	6 (9%)	4 (5%)	7%
11	20	10 (15%)	10 (14%)	14%
10	16	9 (14%)	7 (10%)	12%
9	14	6 (9%)	8 (11%)	10%

Some Dislike (Pile 2 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
8	14	4 (6%)	10 (14%)	10%
7	8	3 (5%)	5 (7%)	6%
6	4	4 (6%)	0	3%
5	3	1 (1%)	2 (3%)	2%

Strong Dislike (Pile 1 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
4	0	0	0	0

Chi-square value 12.386, df 17, asymp. sig (2-sided) .575

D22B

Vocational Card Sort Scores – Chief Executive Officer (Rank #22)

Frequency Table Distribution Series (sig. 00083)*

C.E.O	5	4	3	2	1	
Deck A Tasks	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	1 (1%)	4 (6%)	20 (31%)	28 (43%)	12 (18%)	65
Female	2 (3%)	6 (8%)	20 (27%)	29 (39%)	17 (23%)	74
Total / %	3 (2%)	10 (7%)	40 (29%)	57 (41%)	29 (21%)	139

(Chi-square value 1.035, df 4, sig .905)

C.E.O.	5	4	3	2	1	
Deck B Workplace	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	2 (3%)	11 (17%)	29 (44%)	16 (25%)	7 (11%)	65
Female	8 (11%)	13 (18%)	28 (38%)	20 (27%)	5 (7%)	74
Total / %	10 (7%)	24 (17%)	57 (41%)	36 (26%)	12 (9%)	139

(Chi-square value 3.996, df 4, sig .407)

C.E.O	5	4	3	2	1	
Deck C Title	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	8 (12%)	18 (28%)	20 (31%)	10 (15%)	9 (14%)	65
Female	12 (16%)	12 (16%)	26 (35%)	15 (20%)	9 (12%)	74
Total / %	20 (14%)	30 (22%)	45 (33%)	25 (18%)	18 (13%)	139

(Chi-square value 3.213, df 4, sig .523)

C.E.O.	5	4	3	2	1	
Deck D Tools	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	7 (11%)	17 (26%)	16 (25%)	14 (22%)	11 (17%)	65
Female	10 (11%)	14 (19%)	25 (34%)	13 (18%)	12 (16%)	74
Total / %	17 (12%)	31 (22%)	41 (29%)	27 (19%)	23 (16%)	139

(Chi-square value 2.303, df 4, sig .680)

D23A

Automobile Services Mechanic – Rank #23

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
20	15	15 (23%)	0	11%
19	4	3 (5%)	1 (1.4%)	3%
18	3	3 (5%)	0	2%
17	7	4 (6%)	3 (4%)	5%

Some Interest (Pile 4 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
16	8	7 (11%)	1 (1%)	6%
15	3	2 (3%)	1 (1%)	2%
14	8	5 (8%)	3 (4%)	6%
13	3	1(1%)	2 (3%)	2%

No Interest (Pile 3 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
12	9	4 (6%)	5 (7%)	7%
11	10	2 (3%)	8 (11%)	7%
10	7	3(4%)	4 (5%)	5%
9	9	2 (3%)	7 (9%)	7%

Some Dislike (Pile 2 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
8	11	5 (8%)	6 (8%)	8%
7	8	2 (3%)	6 (8%)	6%
6	10	4 (6%)	6 (8%)	7%
5	6	2 (3%)	4 (5%)	4%

Strong Dislike (Pile 1 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
4	18	1 (1%)	17 (23%)	13%

Pearson Chi Square Value 48.441, df 4, sig.000*

D23B

Vocational Card Sort Scores – Automobile Service Mechanic (Rank #23)

Frequency Distribution Table Series (.00083)*

Auto Mechanic Deck A Tasks	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	23 (35%)	14 (22%)	5 (8%)	15 (23%)	8 (12%)	65
Female	3 (4%)	8 (11%)	18 (24%)	19 (26%)	26 (35%)	74
Total / %	26 (19%)	22 (16%)	23 (16%)	34 (25%)	34 (25%)	139

Chi-square value 33.928, df 4, sig. 000*

Auto Mechanic Deck B Workplace	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	24 (37%)	16 (25%)	9 (14%)	7 (11%)	9 (14%)	65
Female	2 (3%)	13 (18%)	12 (16%)	16 (22%)	31 (42%)	74
Total / %	26 (19%)	29 (21%)	21 (15%)	23 (16%)	40 (29%)	139

Chi-square value 33.538, df 4, sig. 000*

Auto Mechanic Deck C Title	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	25 (39%)	12 (19%)	14 (22%)	9 (14%)	5 (8%)	65
Female	2 (3%)	7 (10%)	15 (20%)	19 (25%)	31 (42%)	74
Total / %	27 (19%)	19 (14%)	29 (21%)	28 (20%)	36 (26%)	139

Chi-square value 42.889, df 4, sig. 000*

Auto Mechanic Deck D Tools	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	19 (29%)	18 (28%)	6 (9%)	11 (17%)	11 (17%)	65
Female	2 (3%)	9 (12%)	15 (20%)	17 (23%)	31 (42%)	74
Total / %	21 (15%)	27 (19%)	21 (15%)	28 (20%)	42 (30%)	139

Chi-square value 30.976, df 4, sig. 000*

D24A

Architect – Rank #24

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
20	6	4 (6%)	2 (3%)	4%
19	2	2 (3%)	0	1%
18	3	2 (3%)	1 (1%)	2%
17	5	3 (5%)	2 (3%)	4%

Some Interest (Pile 4 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
16	3	3 (5%)	0	2%
15	7	5 (8%)	2 (3%)	5%
14	14	13 (20%)	1 (1%)	10%
13	11	7 (11%)	4 (5%)	8%

No Interest (Pile 3 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
12	11	4 (6%)	7 (10%)	8%
11	8	5 (8%)	3 (4%)	6%
10	12	4 (6%)	8 (11%)	9%
9	13	3 (5%)	10 (14%)	9%

Some Dislike (Pile 2 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
8	13	4 (6%)	9 (12%)	9%
7	9	2 (3%)	7 (10%)	7%
6	12	3 (5%)	9 (12%)	9%
5	8	1 (1%)	7 (10%)	6%

Strong Dislike (Pile 1 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
4	2	0	2 (3%)	1%

Chi-square value 38.791, df 17, sig .002

D24B

Vocational Card Sort Scores – Architect (Rank #24)

Frequency Table Distribution Series (sig. 00083)*

Architect	5	4	3	2	1	
Deck A Tasks	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	12 (19%)	24 (37%)	12 (19%)	12 (19%)	5 (8%)	65
Female	4 (5%)	6 (8%)	21 (28%)	18 (24%)	25 (34%)	74
Total / %	16 (12%)	30 (22%)	33 (26%)	30 (22%)	30 (22%)	139

(Chi-square value 31.337, df 4, sig .000*)

Architect	5	4	3	2	1	
Deck B Workplace	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	8 (12%)	14 (22%)	23 (35%)	10 (15%)	10 (15%)	65
Female	3 (4%)	4 (5%)	23 (31%)	29 (39%)	15 (20%)	74
Total / %	11 (8%)	18 (13%)	46 (33%)	39 (28%)	25 (18%)	139

(Chi-square value 17.576, df 4, sig .001)

Architect	5	4	3	2	1	
Deck C Title	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	12 (19%)	18 (28%)	15 (23%)	18 (28%)	2 (3%)	65
Female	7 (10%)	7 (10%)	19 (26%)	19 (26%)	22 (30%)	74
Total / %	19 (14%)	25 (18%)	34 (25%)	37 (27%)	24 (17%)	139

(Chi-square value 22.833, df 4, sig .000*)

Architect	5	4	3	2	1	
Deck D Tools	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	9 (14%)	24 (37%)	10 (15%)	16 (25%)	6 (9%)	65
Female	5 (7%)	9 (12%)	17 (27%)	22 (30%)	21 (28%)	74
Total / %	14 (10%)	33 (24%)	27 (19%)	38 (27%)	27 (19%)	139

(Chi-square value 18.552, df 4, sig .001)

D25A

Firefighter – Rank #25

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
20	5	3 (5%)	2 (1%)	4%
19	3	2 (3%)	1 (1%)	2%
18	5	4 (6%)	1 (1%)	4%
17	8	7 (11%)	1 (1%)	6%

Some Interest (Pile 4 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
16	8	7 (11%)	1 (1%)	7%
15	7	3 (4%)	4 (5%)	5%
14	9	4 (6%)	5 (7%)	7%
13	6	3 (5%)	3 (4%)	4%

No Interest (Pile 3 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
12	8	3 (5%)	5 (7%)	6%
11	14	4 (6%)	10 (14%)	10%
10	12	8 (12%)	4 (5%)	9%
9	7	4 (8%)	3 (4%)	5%

Some Dislike (Pile 2 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
8	6	4 (8%)	2 (3%)	4%
7	10	2 (3%)	8 (11%)	7%
6	10	3 (5%)	7 (10%)	7%
5	15	4 (6%)	11 (15%)	11%

Strong Dislike (Pile 1 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
4	6	0	6 (8%)	4%

Chi-square value 30.815, df 16, sig .014

D25B

Vocational Card Sort Scores – Firefighter (Rank #25)

Frequency Table Distribution Series (sig. 00083)*

Firefighter	5	4	3	2	1	
Deck A Tasks	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	12 (19%)	14 (22%)	11 (17%)	15 (23%)	13 (20%)	65
Female	4 (5%)	12 (16%)	15 (20%)	18 (24%)	25 (34%)	74
Total / %	16 (12%)	26 (19%)	26 (19%)	33 (24%)	38 (27%)	139

(Chi-square value 8.283 df 4, sig .082)

Firefighter	5	4	3	2	1	
Deck B Workplace	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	12 (18%)	17 (26%)	13 (20%)	13 (20%)	10 (15%)	65
Female	9 (12%)	9 (12%)	18 (24%)	18 (24%)	20 (27%)	74
Total / %	21 (15%)	26 (19%)	31 (22%)	31 (22%)	31 (22%)	139

(Chi-square value 7.284, df 4, sig .122)

Firefighter	5	4	3	2	1	
Deck C Title	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	6 (9%)	25 (39%)	19 (27%)	9 (14%)	6 (9%)	65
Female	4 (5%)	17 (23%)	17 (23%)	11 (15%)	25 (34%)	74
Total / %	10 (7%)	42 (30%)	36 (26%)	20 (14%)	31 (22%)	139

(Chi-square value 13.353, df 4, sig .010)

Firefighter	5	4	3	2	1	
Deck D Tools	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	15 (23%)	18 (28%)	11 (17%)	14 (22%)	7 (11%)	65
Female	4 (5%)	7 (10%)	16 (22%)	14 (19%)	33 (45%)	74
Total / %	19 (14%)	25 (18%)	27 (19%)	28 (20%)	40 (29%)	139

(Chi-square value 28.571, df 4, sig .000*)

D26A

Retail Sales Manager – Rank #26

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
20	0	0	0	0
19	1	0	1 (1%)	1%
18	2	2 (3%)	0	1%
17	7	3 (5%)	4 (5%)	5%

Some Interest (Pile 4 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
16	6	3 (5%)	3 (4%)	4%
15	5	2 (3%)	3 (4%)	4%
14	11	5 (8%)	6 (8%)	8%
13	9	4 (6%)	5 (7%)	7%

No Interest (Pile 3 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
12	10	3 (5%)	7 (10%)	7%
11	10	6 (9%)	4 (5%)	7%
10	22	11 (17%)	11 (15%)	16%
9	13	6 (9%)	7 (10%)	9%

Some Dislike (Pile 2 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
8	16	7 (11%)	9 (12%)	12%
7	10	7 (11%)	3 (4%)	7%
6	8	4 (6%)	4 (5%)	6%
5	5	1 (1%)	4 (5%)	4%

Strong Dislike (Pile 1 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
4	4	1 (1%)	3 (4%)	3%

Chi-square value 9.730, df 15, sig .836

D26B

Vocational Card Sort Scores – Retail Sales Manager (Rank #26)

Frequency Table Distribution Series (sig. 00083)*

Retail Sales Mgr. Deck A Tasks	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	4 (6%)	16 (25%)	15 (23%)	21 (32%)	9 (14%)	65
Female	3 (4%)	8 (11%)	25 (34%)	17 (23 %)	21 (28%)	74
Total / %	7 (5%)	24 (17%)	40 (29%)	38 (27%)	30 (22%)	139

(Chi-square value 9.990, df 4, sig .041)

Retail Sales Mgr. Deck B Workplace	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	5 (8%)	10 (15%)	14 (22%)	20 (31%)	16 (25%)	65
Female	8 (11%)	18 (24%)	16 (22%)	19 (26%)	13 (18%)	74
Total / %	13 (9%)	28 (20%)	30 (22%)	39 (28%)	29 (21%)	139

(Chi-square value 2.877, df 4, sig .579)

Retail Sales Mgr. Deck C Title	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	4 (6%)	14 (22%)	24 (37%)	15 (23%)	8 (12%)	65
Female	3 (4%)	11 (15%)	29 (39%)	17 (23%)	13 (18%)	74
Total / %	7 (5%)	25 (18%)	53 (38%)	32 (23%)	21 (15%)	139

(Chi-square value 2.719, df 4, sig .743)

Retail Sales Mgr. Deck D Tools	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	2 (3%)	8 (12%)	21 (32%)	21 (32%)	13 (20%)	65
Female	4 (5%)	13 (18%)	20 (27%)	24 (32%)	13 (18%)	74
Total / %	6 (4%)	21 (15%)	41 (30%)	45 (32%)	26 (19%)	139

(Chi-square value 41.505, df 4, sig .826)

D27A

Agricultural Technician / Farmer – Rank #27

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
20	3	2 (3%)	1 (1%)	2%
19	5	2 (3%)	3 (4%)	4%
18	8	4 (6%)	4 (5%)	6%
17	2	2 (3%)	0	1%

Some Interest (Pile 4 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
16	9	3 (5%)	6 (8%)	7%
15	10	8 (12%)	2 (3%)	7%
14	7	4 (6%)	3 (4%)	5%
13	4	2 (3%)	2 (3%)	3%

No Interest (Pile 3 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
12	7	6 (9%)	1 (1%)	5%
11	6	3 (5%)	3 (5%)	4%
10	8	4 (6%)	4 (5%)	6%
9	12	5 (8%)	7 (10%)	9%

Some Dislike (Pile 2 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
8	13	8 (12%)	5 (7%)	9%
7	12	5 (8%)	7 (10%)	9%
6	14	2 (3%)	12 (16%)	10%
5	7	2 (3%)	5 (7%)	5%

Strong Dislike (Pile 1 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
4	12	3 (5%)	9 (12%)	9%

Chi-square value 24.243, df 17, sig .136

D27B

Vocational Card Sort Scores – Agricultural Technician / Farmer (Rank #27)

Frequency Table Distribution Series (sig. 00083)*

Farmer	5	4	3	2	1	
Deck A Tasks	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	2 (3%)	12 (19%)	14 (21%)	21 (32%)	16 (25%)	65
Female	6 (8%)	9 (12%)	12 (16%)	25 (34%)	22 (30%)	74
Total / %	8 (6%)	21 (15%)	26 (19%)	46 (33%)	37 (27%)	139

(Chi-square value 4.040, df 4, sig .544)

Farmer	5	4	3	2	1	
Deck B Workplace	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	20 (31%)	12 (19%)	8 (12%)	15 (23%)	10 (15%)	65
Female	10 (14%)	15 (20%)	6 (8%)	15 (20%)	28 (38%)	74
Total / %	30 (22%)	27 (19%)	14 (10%)	20 (22%)	38 (27%)	139

(Chi-square value 11.946, df 4, sig .018)

Farmer	5	4	3	2	1	
Deck C Title	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	12 (19%)	15 (23%)	16 (25%)	13 (20%)	9 (14%)	65
Female	7 (9%)	9 (12%)	13 (18%)	16 (22%)	29 (39%)	74
Total / %	19 (14%)	24 (17%)	29 (21%)	29 (21%)	38 (27%)	139

(Chi-square value 13.436, df 4, sig .009)

Farmer	5	4	3	2	1	
Deck D Tools	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	7 (11%)	16 (25%)	11 (17%)	15 (23%)	16 (25%)	65
Female	6 (8%)	10 (14%)	15 (20%)	19 (26%)	24 (32%)	74
Total / %	13 (9%)	26 (19%)	26 (19%)	34 (24%)	40 (29%)	139

(Chi-square value 3.580, df 4, sig .466)

D28A

Welder / Solder / Brazer – Rank #28

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
20	10	9 (14%)	1 (1%)	7%
19	5	5 (8%)	0	4%
18	2	2 (3%)	0	1%
17	4	3 (5%)	1 (1%)	3%

Some Interest (Pile 4 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
16	8	8 (12%)	0	6%
15	8	6 (9%)	2 (3%)	6%
14	4	3 (5%)	1 (1%)	3%
13	9	5 (8%)	4 (5%)	7%

No Interest (Pile 3 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
12	7	3 (5%)	4 (5%)	5%
11	6	1 (1%)	5 (7%)	4%
10	8	4 (6%)	4 (5%)	6%
9	7	5 (8%)	2 (3%)	5%

Some Dislike (Pile 2 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
8	10	1 (1%)	9 (12%)	7%
7	11	3 (5%)	8 (11%)	8%
6	9	2 (3%)	7 (10%)	7%
5	10	1 (1%)	9 (12%)	7%

Strong Dislike (Pile 1 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
4	21	4 (6%)	17 (23%)	15%

Chi-square value 55.306, df 17, sig .000*

D28B

Vocational Card Sort Scores – Welder / Cutter / Brazer (Rank #28)

Frequency Distribution Table Series (sig. 00083)*

	5	4	3	2	1	
Deck A Tasks	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	18 (28%)	21 (32%)	9 (14%)	9 (14%)	8 (12%)	65
Female	3 (4%)	9 (12%)	11 (15%)	18 (22%)	35 (47%)	74
Total / %	21 (15%)	30 (22%)	20 (14%)	25 (18%)	43 (31%)	139

(Chi-square value 34.188, df 4, sig .000*)

	5	4	3	2	1	
Deck B Workplace	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	16 (25%)	19 (29%)	15 (23%)	9 (14%)	6 (9%)	65
Female	1 (1%)	3 (4%)	21 (28%)	17 (23%)	32 (43%)	74
Total / %	17 (12%)	22 (16%)	36 (26%)	26 (19%)	38 (19%)	139

(Chi-square value 45.732, df 4, sig .000*)

	5	4	3	2	1	
Deck C Title	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	17 (26%)	14 (22%)	15 (23%)	11 (17%)	8 (12%)	65
Female	1 (1%)	6 (8%)	15 (20%)	14 (19%)	38 (51%)	74
Total / %	18 (13%)	20 (14%)	30 (22%)	25 (18%)	46 (33%)	139

(Chi-square value 36.919, df 4, sig .000*)

	5	4	3	2	1	
Deck D Tools	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	18 (28%)	20 (31%)	10 (15%)	4 (6%)	12 (19%)	65
Female	2 (3%)	11 (15%)	11 (15%)	11 (15%)	38 (51%)	74
Total / %	20 (14%)	31 (22%)	21 (15%)	15 (11%)	50 (36%)	139

(Chi-square value 33.806, df 4, sig .000*)

D29A

Personal Home Care Aide – Rank #29

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
20	0	0	0	0
19	1	0	1 (1%)	1%
18	3	0	3 (4%)	2%
17	0	0	0	0

Some Interest (Pile 4 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
16	6	0	6 (8%)	4%
15	5	2 (3%)	3 (4%)	4%
14	9	1 (1%)	8 (11%)	7%
13	16	6 (9%)	10 (14%)	12%

No Interest (Pile 3 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
12	14	7 (11%)	7 (10%)	10%
11	14	8 (12%)	6 (8%)	10%
10	14	9 (14%)	5 (7%)	10%
9	18	10 (15%)	8 (11%)	13%

Some Dislike (Pile 2 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
8	12	8 (12%)	4 (5%)	9%
7	12	3 (5%)	2 (3%)	9%
6	12	8 (12%)	4 (3%)	9%
5	6	2 (3%)	4 (5%)	4%

Strong Dislike (Pile 1 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
4	4	1 (1%)	3 (4%)	3%

Chi-square value 22.339, df 14, sig .072

D29B

Vocational Card Sort Scores – Personal Home Health Aide (Rank #29)

Frequency Distribution Table Series (sig. 00083)*

Home Health Aide Deck A Tasks	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	1 (1%)	5 (8%)	15 (23%)	26 (40%)	18 (28%)	65
Female	15 (20%)	19 (26%)	16 (22%)	11 (15%)	13 (18%)	74
Total / %	16 (12%)	24 (17%)	31 (22%)	37 (27%)	31 (22%)	139

(Chi-square value 26.866, df 4, sig .000*)

Home Health Aide Deck B Workplace	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	0	5 (8%)	13 (20%)	20 (31%)	27 (42%)	65
Female	9 (12%)	12 (16%)	24 (32%)	18 (24%)	11 (14%)	74
Total / %	9 (7%)	17 (12%)	37 (27%)	38 (27%)	38 (27%)	139

(Chi-square value 21.507, df 4, sig .000*)

Home Health Aide Deck C Title	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	1 (1%)	3 (5%)	22 (34%)	25 (39%)	14 (22%)	65
Female	13 (18%)	21 (28%)	19 (26%)	10 (14%)	11 (15%)	74
Total / %	14 (10%)	24 (17%)	41 (30%)	35 (25%)	25 (18%)	139

(Chi-square value 30.338, df 4, sig .000*)

Home Health Aide Deck D Tools	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	15 (23%)	16 (25%)	12 (19%)	12 (19%)	10 (15%)	65
Female	1 (1%)	9 (12%)	15 (20%)	14 (20%)	35 (47%)	74
Total / %	16 (12%)	25 (18%)	27 (19%)	26 (19%)	45 (32%)	139

(Chi-square value 28.121, df 4, sig .000*)

D30A

Financial Advisor – Rank #30

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
20	0	0	0	0
19	4	1 (1%)	3 (4%)	3%
18	1	0	1 (1%)	1%
17	2	1 (1%)	1 (1%)	1%

Some Interest (Pile 4 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
16	3	2 (3%)	1 (1%)	2%
15	7	4 (6%)	3 (4%)	5%
14	5	3 (5%)	2 (3%)	4%
13	12	4 (6%)	8 (11%)	9%

No Interest (Pile 3 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
12	15	7 (11%)	8 (11%)	11%
11	14	8 (12%)	6 (8%)	10%
10	13	6 (9%)	7 (10%)	9%
9	18	9 (14%)	9 (12%)	13%

Some Dislike (Pile 2 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
8	13	6 (9%)	7 (10%)	9%
7	18	8 (12%)	10 (14%)	13%
6	10	4 (6%)	6 (8%)	7%
5	2	1 (1%)	1 (1%)	1%

Strong Dislike (Pile 1 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
4	2	1 (1%)	1 (1%)	1%

Chi-square value 4.574, df 15, sig .995

D30B

Vocational Card Sort Scores – Financial Advisor (Rank #30)

Frequency Distribution Table Series (sig. 00083)*

Financial Advisor Deck A Tasks	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	2 (3%)	5 (8%)	25 (39%)	20 (31%)	13 (20%)	65
Female	5 (7%)	8 (11%)	21 (28%)	18 (24%)	22 (30%)	74
Total / %	7 (5%)	13 (9%)	46 (33%)	38 (27%)	35 (25%)	139

(Chi-square value 4.180, df 4, sig .682)

Financial Advisor Deck B Workplace	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	3 (5%)	8 (12%)	25 (39%)	16 (25%)	13 (20%)	65
Female	7 (10%)	17 (23%)	19 (26%)	22 (30%)	9 (12%)	74
Total / %	10 (7%)	25 (18%)	44 (32%)	38 (27%)	22 (16%)	139

(Chi-square value 6.779, df 4, sig. .148)

Financial Advisor Deck C Title	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	4 (6%)	4 (6%)	20 (31%)	21 (32%)	16 (25%)	65
Female	2 (3%)	9 (12%)	20 (27%)	27 (37%)	16 (22%)	74
Total / %	6 (4%)	13 (9%)	40 (29%)	48 (35%)	32 (23%)	139

(Chi-square value 2.769, df 4, sig .597)

Financial Advisor Deck D Tools	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	8 (12%)	16 (25%)	16 (25%)	16 (25%)	9 (14%)	65
Female	8 (11%)	13 (18%)	18 (24%)	22 (30%)	13 (18%)	74
Total / %	16 (12%)	29 (21%)	34 (25%)	38 (27%)	22 (16%)	139

(Chi-square value 1.526, df 4, sig .822)

D31A

Coroner – Rank #31

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
20	4	1 (1%)	3 (4%)	3%
19	1	0	1 (1%)	1%
18	0	0	0	0
17	5	2 (3%)	3 (4%)	4%

Some Interest (Pile 4 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
16	8	1 (1%)	7 (10%)	6%
15	8	4 (6%)	5 (5%)	6%
14	10	4 (6%)	6 (8%)	7%
13	8	4 (6%)	4 (5%)	6%

No Interest (Pile 3 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
12	9	6 (9%)	3 (4%)	7%
11	10	6 (9%)	4 (5%)	7%
10	13	5 (8%)	8 (11%)	9%
9	7	3 (5%)	4 (5%)	5%

Some Dislike (Pile 2 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
8	11	7 (11%)	4 (5%)	8%
7	18	7 (11%)	11 (15%)	13%
6	10	6 (9%)	4 (5%)	7%
5	9	5 (8%)	4 (5%)	7%

Strong Dislike (Pile 1 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
4	8	4 (6%)	4 (5%)	6%

Chi-square value 11.017, df 15, sig .751

D31B

Vocational Card Sort Scores – Coroner (Rank #31)

Frequency Distribution Table Series (sig. 00083)*

Coroner	5	4	3	2	1	
Deck A Tasks	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	2 (3%)	11 (17%)	17 (26%)	21 (32%)	14 (22%)	65
Female	11 (15%)	15 (20%)	18 (24%)	12 (16%)	18 (24%)	74
Total / %	13 (9%)	26 (19%)	35 (25%)	33 (24%)	32 (23%)	139

(Chi-square value 9.285, df 4, sig .054)

Coroner	5	4	3	2	1	
Deck B Workplace	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	3 (5%)	14 (22%)	15 (23%)	15 (23%)	18 (28%)	65
Female	15 (20%)	22 (30%)	14 (19%)	8 (11%)	15 (20%)	74
Total / %	18 (13%)	36 (26%)	29 (21%)	23 (17%)	18 (13%)	139

(Chi-square value 11.682, df 4, sig .020)

Coroner	5	4	3	2	1	
Deck C Title	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	3 (5%)	5 (8%)	21 (32%)	18 (28%)	18 (28%)	65
Female	4 (5%)	11 (15%)	14 (19%)	8 (11%)	37 (50%)	74
Total / %	7 (5%)	16 (12%)	35 (25%)	26 (19%)	55 (35%)	139

(Chi-square value 13.677, df 4, sig .008)

Coroner	5	4	3	2	1	
Deck D Tools	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	6 (9%)	11 (17%)	11 (17%)	15 (23%)	22 (34%)	65
Female	6 (8%)	16 (22%)	17 (23%)	15 (20%)	20 (27%)	74
Total / %	12 (9%)	27 (19%)	28 (20%)	30 (22%)	42 (30%)	139

(Chi-square value 1.731, df 4, sig .785)

D32A

Executive Administrative Assistant – Rank #32

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
20	0	0	0	0
19	2	1 (1%)	1 (1%)	1%
18	2	0	2 (2%)	1%
17	2	0	2 (2%)	1%

Some Interest (Pile 4 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
16	3	1 (1%)	2 (2%)	2%
15	6	2 (3%)	4 (5%)	4%
14	6	2 (3%)	4 (5%)	4%
13	7	2 (3%)	5 (7%)	5%

No Interest (Pile 3 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
12	19	8 (12%)	11 (15%)	14%
11	19	9 (14%)	10 (14%)	14%
10	20	13 (20%)	7 (10%)	14%
9	15	6 (9%)	9 (12%)	11%

Some Dislike (Pile 2 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
8	18	11 (17%)	7 (10%)	13%
7	11	4 (6%)	7 (10%)	8%
6	5	4 (6%)	1 (1%)	4%
5	4	2 (3%)	2 (3%)	3%

Strong Dislike (Pile 1 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
4	3	1 (%)	2 (3%)	2%

Chi-square value 13.526, df 16, sig .634

D32B

Vocational Card Sort Scores – Executive Administrative Assistant (Rank #32)

Frequency Distribution Table Series (sig. 00083)*

Executive Assistant Deck A Tasks	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	1 (1%)	4 (6%)	16 (25%)	30 (46%)	14 (22%)	65
Female	4 (5%)	14 (19%)	19 (24%)	23 (31%)	14 (19%)	74
Total / %	5 (4%)	18 (13%)	35 (25%)	53 (28%)	28 (20%)	139

Chi-square value 7.988, df 4, sig. .092;

Executive Assistant Deck B Workplace	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	2 (3%)	5 (8%)	19 (29%)	24 (37%)	15 (23%)	65
Female	3 (4%)	12 (16%)	27 (36%)	23 (31%)	9 (12%)	74
Total / %	5 (4%)	17 (12%)	46 (33%)	47 (34%)	24 (17%)	139

Chi-square value 5.435, df 4, sig. .246

Executive Assistant Deck C Title	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	2 (3%)	7 (11%)	25 (39%)	21 (32%)	10 (15%)	65
Female	4 (5%)	14 (19%)	23 (31%)	18 (24%)	14 (19%)	74
Total / %	6 (4%)	21 (15%)	48 (34%)	39 (28%)	24 (17%)	139

Chi-square value 4.417, df 4, sig. .491

Executive Assistant Deck D Tools	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	7 (11%)	9 (14%)	20 (31%)	20 (31%)	9 (14%)	65
Female	8 (11%)	13 (18%)	23 (31%)	19 (26%)	11 (15%)	74
Total / %	15 (11%)	22 (16%)	43 (31%)	39 (28%)	20 (14%)	139

Chi-square value .649, df 4, sig. .957

D33A

Biomedical Engineer – Rank #33

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
20	0	0	0	0
19	0	0	0	0
18	2	0	2 (3%)	1%
17	2	1(1%)	1 (1%)	1%

Some Interest (Pile 4 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
16	3	0	3 (4%)	2%
15	9	1 (1%)	8 (11%)	6%
14	8	3 (5%)	5 (7%)	6%
13	15	7 (11%)	8 (11%)	11%

No Interest (Pile 3 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
12	13	6 (9%)	7 (9%)	9%
11	9	4 (6%)	5 (7%)	6%
10	18	6 (9%)	12 (16%)	13%
9	12	7 (11%)	5 (7%)	9%

Some Dislike (Pile 2 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
8	16	10 (15%)	6 (8%)	11%
7	16	8 (12%)	8 (11%)	11%
6	9	5 (8%)	4 (5%)	6%
5	3	3 (5%)	0	2%

Strong Dislike (Pile 1 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
4	4	4 (6%)	0	3%

(Chi-square value 21.150, df 14, sig .098)

D33B

Vocational Card Sort Scores – Biomedical Engineer (Rank #33)

Frequency Distribution Table Series (sig. 00083)*

Biomedical Engineer Deck A Tasks	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	1 (1%)	6 (9%)	17 (26%)	24 (37%)	17 (26%)	65
Female	17 (23%)	24 (32%)	21 (28%)	7 (9%)	5 (7%)	74
Total / %	18 (13%)	30 (22%)	38 (27%)	31 (22%)	22 (16%)	139

(Chi-square value 40.900, df 4, sig .000*)

Biomedical Engineer Deck B Workplace	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	2 (3%)	7 (11%)	12 (19%)	24 (37%)	20 (31%)	65
Female	7 (10%)	19 (26%)	20 (27%)	16 (22%)	12 (16%)	74
Total / %	9 (6%)	26 (19%)	32 (23%)	40 (29%)	32 (23%)	139

(Chi-square value 13.390, df 4, sig .000*)

Biomedical Engineer Deck C Title	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	2 (3%)	8 (12%)	22 (34%)	22 (34%)	11 (17%)	65
Female	2 (3%)	4 (5%)	22 (30%)	21 (28%)	25 (34%)	74
Total / %	4 (3%)	12 (9%)	44 (32%)	43 (31%)	36 (26%)	139

(Chi-square value 6.244, df 4, sig .182)

Biomedical Engineer Deck D Tools	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	4 (6%)	7 (11%)	14 (21%)	23 (35%)	17 (26%)	65
Female	8 (11%)	12 (16%)	13 (18%)	22 (30%)	19 (26%)	74
Total / %	12 (9%)	19 (14%)	27 (19%)	45 (32%)	36 (26%)	139

(Chi-square value 2.246, df 4, sig .691)

D34A

Speech Pathologist – Rank #34

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
20	1	0	1 (1%)	1%
19	1	0	1 (1%)	1%
18	2	1 (1%)	1 (1%)	1%
17	0	0	0	0

Some Interest (Pile 4 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
16	6	1 (1%)	5 (7%)	4%
15	8	1 (1%)	7 (10%)	6%
14	12	2 (3%)	10 (14%)	9%
13	7	5 (8%)	2 (3%)	5%

No Interest (Pile 3 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
12	15	4 (6%)	11 (15%)	11%
11	10	2 (3%)	8 (11%)	7%
10	15	8 (12%)	7 (10%)	11%
9	11	7 (11%)	4 (5%)	8%

Some Dislike (Pile 2 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
8	22	14 (22%)	8 (11%)	16%
7	10	6 (9%)	4 (5%)	7%
6	15	12 (19%)	3 (4%)	11%
5	3	1 (1%)	2 (3%)	2%

Strong Dislike (Pile 1 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
4	2	1 (1%)	1 (1%)	1%

Chi-square value 29.849, df 15, sig .008

D34B

Vocational Card Sort Scores – Speech Pathologist (Rank #34)

Frequency Distribution Table Series (sig. 00083)*

Speech Pathologist Deck A Tasks	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	2 (3%)	6 (9%)	14 (22%)	28 (43%)	15 (23%)	65
Female	10 (14%)	18 (24%)	20 (27%)	13 (18%)	13 (18%)	74
Total / %	12 (9%)	24 (17%)	34 (25%)	41 (30%)	28 (20%)	139

(Chi-square value 17.514, df 4, sig .002)

Speech Pathologist Deck B Workplace	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	0	4 (6%)	22 (34%)	28 (43%)	11 (17%)	65
Female	12 (16%)	22 (30%)	22 (30%)	11 (15%)	7 (10%)	74
Total / %	12 (9%)	26 (18%)	44 (32%)	39 (28%)	18 (13%)	139

(Chi-square value 32.313, df 4, sig .000*)

Speech Pathologist Deck C Title	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	2 (3%)	4 (6%)	15 (23%)	25 (39%)	19 (29%)	65
Female	7 (10%)	17 (23%)	19 (26%)	17 (24%)	14 (19%)	74
Total / %	9 (15%)	21 (15%)	34 (24%)	42 (30%)	33 (24%)	139

(Chi-square value 13.049, df 4, sig .011)

Speech Pathologist Deck D Tools	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	3 (5%)	4 (6%)	18 (28%)	29 (45%)	11 (17%)	65
Female	1 (1%)	3 (6%)	25 (34%)	29 (39%)	16 (22%)	74
Total / %	4 (3%)	7 (5%)	43 (31%)	58 (42%)	27 (19%)	139

(Chi-square value 2.637, df 4, sig .620)

D35A

Lodging Manager – Rank #35

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
20	0	0	0	0
19	0	0	0	0
18	2	1 (1%)	1 (1%)	1%
17	3	2 (3%)	(1%)	2%

Some Interest (Pile 4 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
16	9	4 (6%)	5 (7%)	7%
15	1	0	1 (1%)	1%
14	6	3 (5%)	3 (4%)	4%
13	10	5 (8%)	5 (7%)	7%

No Interest (Pile 3 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
12	15	8 (12%)	7 (10%)	11%
11	16	6 (9%)	10 (14%)	12%
10	14	7 (11%)	7 (10%)	10%
9	18	7 (11%)	11 (15%)	13%

Some Dislike (Pile 2 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
8	12	5 (8%)	7 (10%)	9%
7	13	7 (11%)	6 (8%)	9%
6	16	8 (12%)	8 (11%)	12%
5	3	2 (3%)	1 (1%)	2%

Strong Dislike (Pile 1 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
4	1	0	1 (1%)	1%

Chi-square value 4.580, df 14, sig .991

D35B

Vocational Card Sort Scores – Lodging Manager (Rank #35)

Frequency Distribution Table Series (sig. 00083)*

Lodging Manager Deck A Tasks	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	3 (5%)	7 (11%)	22 (34%)	19 (29%)	14 (27%)	65
Female	3 (4%)	12 (16%)	22 (30%)	20 (27%)	17 (23%)	74
Total / %	6 (4%)	19 (14%)	44 (32%)	39 (28%)	31 (22%)	139

(Chi-square value 1.053, df 4, sig .902)

Lodging Manager Deck B Workplace	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	1 (1%)	11 (17%)	19 (29%)	14 (22%)	20 (31%)	65
Female	7 (10%)	12 (16%)	23 (31%)	17 (23%)	14 (19%)	74
Total / %	8 (6%)	24 (17%)	42 (30%)	31 (22%)	34 (25%)	139

(Chi-square value 5.838, df 4, sig .212)

Lodging Manager Deck C Title	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	2 (3%)	12 (19%)	27 (42%)	15 (23%)	9 (14%)	65
Female	2 (3%)	10 (14%)	18 (24%)	25 (34%)	19 (26%)	74
Total / %	4 (3%)	22 (16%)	45 (32%)	40 (29%)	28 (20%)	139

(Chi-square value 7.502, df 4, sig .112)

Lodging Manager Deck D Tools	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	4 (6%)	10 (15%)	21 (32%)	19 (29%)	11 (17%)	65
Female	6 (8%)	9 (12%)	23 (31%)	19 (26%)	17 (23%)	74
Total / %	10 (7%)	19 (14%)	44 (32%)	38 (27%)	28 (20%)	139

(Chi-square value 1.252, df 4, sig .870)

D36A

Industrial Engineer – Rank #36

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
20	1	1 (1%)	0	1%
19	0	0	0	0
18	1	1 (1%)	0	1%
17	0	0	0	0

Some Interest (Pile 4 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
16	7	5 (8%)	2 (2%)	6%
15	5	5 (8%)	0	4%
14	11	9 (14%)	2 (3%)	8%
13	10	6 (9%)	4 (5%)	7%

No Interest (Pile 3 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
12	12	6 (9%)	6 (9%)	9%
11	17	9 (14%)	8 (11%)	12%
10	13	6 (9%)	7 (10%)	9%
9	13	7 (11%)	6 (8%)	9%

Some Dislike (Pile 2 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
8	17	3 (5%)	14 (19%)	12%
7	16	3 (5%)	13 (18%)	11%
6	9	2 (3%)	7 (9%)	6%
5	3	1 (1%)	2 (3%)	2%

Strong Dislike (Pile 1 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
4	4	1 (1%)	3 (4%)	3%

(Chi-square value 30.376, df 4, sig .007)

D36B

Vocational Card Sort Scores – Industrial Engineer (Rank #36)

Frequency Distribution Table Series (sig. 00083)*

Industrial Engineer Deck A Tasks	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	6 (10%)	17 (26%)	14 (22%)	19 (19%)	9 (14%)	65
Female	3 (4%)	2 (3%)	24 (32%)	21 (28%)	24 (32%)	74
Total / %	9 (6%)	19 (14%)	38 (27%)	40 (29%)	33 (24%)	139

(Chi-square value 21.901, df 4, sig .000*)

Industrial Engineer Deck B Workplace	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	1 (1%)	6 (9%)	28 (43%)	23 (35%)	7 (11%)	65
Female	5 (7%)	10 (13%)	26 (35%)	21 (28%)	12 (16%)	74
Total / %	6 (4%)	16 (11%)	54 (39%)	44 (32%)	19 (14%)	139

(Chi-square value 4.584, df 4, sig .333)

Industrial Engineer Deck C Title	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	9 (14%)	17 (26%)	25 (38%)	7 (11%)	7 (11%)	65
Female	1 (1%)	4 (5%)	27 (36%)	15 (20%)	27 (36%)	74
Total / %	10 (7%)	21 (15%)	52 (37%)	22 (16%)	34 (24%)	139

(Chi-square value 28.736, df 4, sig .000*)

Industrial Engineer Deck D Tools	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	8 (12%)	19 (30%)	13 (20%)	16 (25%)	9 (14%)	65
Female	1 (1%)	3 (4%)	17 (23%)	24 (32%)	29 (39%)	74
Total / %	9 (6%)	22 (16%)	30 (22%)	40 (29%)	38 (27%)	139

(Chi-square value 29.280, df 4, sig .000*)

D37A

Airline Pilot – Rank #37

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
20	3	3 (5%)	0	2%
19	2	2 (3%)	0	1%
18	4	2 (3%)	2 (3%)	3%
17	8	6 (9%)	2 (3%)	6%

Some Interest (Pile 4 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
16	15	10 (15%)	5 (7%)	11%
15	2	2 (3%)	0	1%
14	5	5 (8%)	0	4%
13	3	2 (3%)	1 (1%)	2%

No Interest (Pile 3 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
12	6	3 (5%)	3 (4%)	4%
11	6	2 (3%)	4 (5%)	4%
10	8	2 (3%)	6 (8%)	6%
9	15	7 (11%)	8 (11%)	11%

Some Dislike (Pile 2 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
8	12	4 (6%)	8 (11%)	9%
7	12	4 (6%)	8 (11%)	9%
6	18	6 (9%)	12 (16%)	13%
5	11	4 (6%)	7 (10%)	8%

Strong Dislike (Pile 1 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
4	9	1 (1%)	8 (11%)	7%

Chi-square value 29.202, df 16, sig .023

D37B

Vocational Card Sort Scores – Airline Pilot (Rank #37)

Frequency Distribution Table Series (sig. 00083)*

Airline Pilot Deck A Tasks	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	9 (14%)	18 (28%)	7 (11%)	16 (25%)	15 (23%)	65
Female	4 (5%)	8 (11%)	12 (16%)	17 (23%)	22 (45%)	74
Total / %	13 (9%)	26 (19%)	19 (14%)	33 (24%)	48 (35%)	139

(Chi-square value 13.339, df 4, sig .010)

Airline Pilot Deck B Workplace	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	14 (22%)	17 (26%)	11 (17%)	14 (22%)	9 (14%)	65
Female	6 (8%)	6 (8%)	14 (19%)	17 (23%)	31 (42%)	74
Total / %	20 (14%)	23 (17%)	25 (18%)	31 (22%)	40 (29%)	139

(Chi-square value 20.715, df 4, sig .000*)

Airline Pilot Deck C Title	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	7 (11%)	21 (32%)	12 (19%)	10 (15%)	15 (23%)	65
Female	3 (4%)	6 (8%)	18 (24%)	20 (27%)	27 (37%)	74
Total / %	10 (7%)	27 (19%)	30 (22%)	30 (22%)	42 (30%)	139

(Chi-square value 17.385, df 4, sig .002)

Airline Pilot Deck D Tools	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	6 (9%)	22 (34%)	14 (22%)	13 (20%)	10 (15%)	65
Female	4 (5%)	5 (7%)	18 (24%)	21 (28%)	26 (35%)	74
Total / %	10 (7%)	27 (19%)	32 (23%)	34 (24%)	36 (26%)	139

(Chi-square value 20.099, df 4, sig .000*)

D38A

Accountant – Rank #38

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
20	0	0	0	0
19	2	1 (1%)	1 (1%)	1%
18	2	0	2 (3%)	1%
17	2	1 (1%)	1 (1%)	1%

Some Interest (Pile 4 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
16	3	1 (1%)	2 (3%)	2%
15	6	2 (3%)	4 (5%)	4%
14	6	3 (5%)	3 (4%)	4%
13	10	3 (5%)	7 (10%)	7%

No Interest (Pile 3 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
12	8	4 (6%)	4 (5%)	6%
11	22	10 (15%)	12 (16%)	16%
10	13	6 (9%)	7 (10%)	9%
9	20	8 (12%)	12 (16%)	14%

Some Dislike (Pile 2 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
8	21	10 (15%)	11 (15%)	15%
7	9	6 (9%)	3 (4%)	6%
6	7	6 (9%)	1 (1%)	5%
5	6	4 (6%)	2 (3%)	4%

Strong Dislike (Pile 1 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
4	2	0	2 (3%)	1%

Chi-square value 12.414, df 15, sig .715

D38B

Vocational Card Sort Scores – Accountant (Rank #38)

Frequency Distribution Table Series (sig. 00083)*

Accountant	5	4	3	2	1	
Deck A Tasks	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	1 (1%)	3 (4%)	17 (26%)	18 (27%)	26 (40%)	65
Female	2 (3%)	6 (8%)	22 (30%)	28 (38%)	16 (22%)	74
Total / %	3 (2%)	9 (6%)	39 (28%)	46 (33%)	42 (30%)	139

(Chi-square value 5.972, df 4, sig .201)

Accountant	5	4	3	2	1	
Deck B Workplace	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	1 (1%)	17 (26%)	10 (15%)	24 (37%)	13 (20%)	65
Female	12 (16%)	17 (23%)	23 (31%)	13 (18%)	9 (12)	74
Total / %	13 (9%)	34 (24%)	33 (24%)	37 (27%)	22 (16%)	139

(Chi-square value 17.919, df 4, sig .001)

Accountant	5	4	3	2	1	
Deck C Title	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	4 (3%)	8 (10%)	20 (31%)	18 (28%)	15 (23%)	65
Female	8 (11%)	13 (18%)	21 (28%)	15 (20%)	16 (22%)	74
Total / %	12 (9%)	21 (15%)	41 (29%)	33 (24%)	31 (22%)	139

(Chi-square value 3.284, df 4, sig .656)

Accountant	5	4	3	2	1	
Deck D Tools	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	5 (8%)	13 (20%)	18 (18%)	14 (21%)	15 (23%)	65
Female	5 (7%)	10 (13%)	23 (32%)	17 (23%)	18 (24%)	74
Total / %	10 (7%)	23 (16%)	41 (29%)	31 (22%)	33 (24%)	139

(Chi-square value 2.783 df 4, sig .836)

D39A

Electrician – Rank #39

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
20	4	4 (6%)	0	3%
19	5	5 (8%)	0	4%
18	5	5 (8%)	0	4%
17	4	4 (6%)	0	3%

Some Interest (Pile 4 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
16	6	6 (9%)	0	4%
15	5	4 (6%)	1 (1%)	4%
14	7	6 (9%)	1 (1%)	5%
13	8	5 (8%)	3 (4%)	6%

No Interest (Pile 3 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
12	9	2 (3%)	7 (10%)	7%
11	3	1 (1%)	2 (3%)	2%
10	9	5 (8%)	4 (5%)	7%
9	7	4 (6%)	3 (4%)	5%

Some Dislike (Pile 2 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
8	17	5 (8%)	12 (16%)	12%
7	14	5 (8%)	9 (12%)	10%
6	14	3 (5%)	11 (15%)	10%
5	10	0	10 (14%)	7%

Strong Dislike (Pile 1 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
4	12	1 (1%)	11 (14%)	9%

Chi-square value 59.865, df 17, sig .000*

D39B

Vocational Card Sort Scores – Electrician (Rank #39)

Frequency Distribution Table Series (sig. 00083)*

Electrician	5	4	3	2	1	
Deck A Tasks	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	19 (29%)	17 (26%)	12 (19%)	8 (12%)	9 (14%)	65
Female	2 (3%)	5 (7%)	16 (22%)	14 (19%)	37 (50%)	74
Total / %	21 (15%)	22 (16%)	28 (20%)	22 (16%)	46 (33%)	139

(Chi-square value 39.145, df 4, sig .000*)

Electrician	5	4	3	2	1	
Deck B Workplace	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	12 (19%)	16 (25%)	20 (31%)	9 (14%)	8 (12%)	65
Female	1 (1%)	2 (3%)	16 (22%)	20 (27%)	35 (47%)	74
Total / %	13 (9%)	18 (13%)	36 (26%)	29 (21%)	43 (31%)	139

(Chi-square value 41.358, df 4, sig .000*)

Electrician	5	4	3	2	1	
Deck C Title	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	13 (20%)	16 (25%)	11 (17%)	14 (22%)	11 (17%)	65
Female	1 (1%)	0	16 (22%)	20 (27%)	37 (50%)	74
Total / %	14 (10%)	16 (12%)	27 (19%)	34 (25%)	48 (35%)	139

(Chi-square value 41.947, df 4, sig .000*)

Electrician	5	4	3	2	1	
Deck D Tools	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	19 (29%)	19 (29%)	4 (6%)	15 (23%)	8 (12%)	65
Female	1 (1%)	5 (7%)	20 (27%)	21 (28%)	27 (37%)	74
Total / %	20 (14%)	24 (17%)	24 (17%)	36 (26%)	35 (25%)	139

(Chi-square value 45.458, df 4, sig .000*)

D40A

Chemist – Rank #40

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
20	0	0	0	0
19	1	0	1%	1%
18	1	0	1 (1%)	1%
17	7	3 (5%)	4 (5%)	5%

Some Interest (Pile 4 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
16	3	0	3 (4%)	2%
15	2	0	2 (3%)	1%
14	7	1 (1%)	6 (8%)	5%
13	14	3 (5%)	11 (15%)	10%

No Interest (Pile 3 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
12	13	6 (9%)	7 (10%)	9%
11	10	3 (5%)	7 (10%)	7%
10	15	10 (15%)	5 (7%)	11%
9	20	9 (14%)	11 (15%)	14%

Some Dislike (Pile 2 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
8	12	6 (9%)	6 (8%)	9%
7	13	9 (14%)	4 (5%)	9%
6	12	10 (15%)	2 (3%)	9%
5	6	4 (6%)	2 (3%)	4%

Strong Dislike (Pile 1 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
4	3	1 (1%)	2 (3%)	2%

Chi-square value 26.615, df 15, sig .032

D40B

Vocational Card Sort Scores – Chemist (Rank #40)

Frequency Distribution Table Series (sig. 00083)*

Chemist	5	4	3	2	1	
Deck A Tasks	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	1 (1%)	8 (12%)	16 (25%)	24 (37%)	18 (25%)	65
Female	1 (1%)	12 (16%)	17 (23%)	25 (34 %)	19 (26%)	74
Total / %	2 (1%)	20 (14%)	33 (24%)	49 (35%)	37 (26%)	139

(Chi-square value .527, df 4, sig .971)

Chemist	5	4	3	2	1	
Deck B Workplace	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	3 (5%)	9 (14%)	10 (15%)	22 (34%)	21 (32%)	65
Female	19 (26%)	24 (32%)	12 (16%)	10 (14%)	9 (12%)	74
Total / %	22 (16%)	33 (24%)	22 (16%)	32 (24%)	30 (22%)	139

(Chi-square value 27.469, df 4, sig. 000*)

Chemist	5	4	3	2	1	
Deck C Title	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	1 (1%)	6 (9%)	21 (32%)	20 (31%)	17 (26%)	65
Female	1 (1%)	10 (14%)	22 (30%)	16 (22%)	25 (34%)	74
Total / %	2 (1%)	16 (12%)	43 (31%)	36 (26%)	42 (30%)	139

(Chi-square value 2.419, df 4, sig .659)

Chemist	5	4	3	2	1	
Deck D Tools	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	4 (6%)	5 (8%)	10 (16%)	22 (34%)	23 (36%)	65
Female	11 (15%)	23 (31%)	15 (24%)	12 (16%)	13 (18%)	74
Total / %	15 (11%)	28 (20%)	25 (18%)	34 (25%)	36 (26%)	139

(Chi-square value 20.942, df 4, sig .000*)

D41A

Biological Technician – Rank #41

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
20	0	0	0	0
19	0	0	0	0
18	0	0	0	0
17	1	0	1 (1%)	1%

Some Interest (Pile 4 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
16	3	1 (1%)	2 (3%)	2%
15	4	0	4 (5%)	2%
14	9	3 (5%)	6 (8%)	7%
13	10	5 (8%)	5 (7%)	7%

No Interest (Pile 3 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
12	17	8 (12%)	9 (12%)	12%
11	16	7 (11%)	9 (12%)	12%
10	25	11 (17%)	14 (19%)	19%
9	10	5 (8%)	5 (7%)	7%

Some Dislike (Pile 2 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
8	13	8 (12%)	5 (7%)	9%
7	17	11 (17%)	6 (8%)	12%
6	10	6 (9%)	4 (5%)	7%
5	2	0	2 (3%)	1%

Strong Dislike (Pile 1 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
4	2	0	2 (3%)	1%

Chi-square value 13.037, df 15, sig . 445

D41B

Vocational Card Sort Scores – Biological Technician (Rank #41)

Frequency Distribution Table Series (sig. 00083)*

Biological Technician Deck A Tasks	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	0	14 (22%)	15 (23%)	22 (34%)	14 (22%)	65
Female	5 (7%)	16 (22%)	15 (20%)	21 (28%)	16 (22%)	74
Total / %	5 (4%)	30 (22%)	30 (22%)	43 (31%)	30 (22%)	139

(Chi-square value 5.731, df 4, sig .333)

Biological Technician Deck B Workplace	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	0	13 (20%)	15 (23%)	23 (35%)	14 (22%)	65
Female	6 (8%)	23 (31%)	23 (31%)	11 (15%)	11 (15%)	74
Total / %	6 (4%)	36 (26%)	38 (27%)	34 (25%)	25 (18%)	139

(Chi-square value 14.535, df 4, sig .006)

Biological Technician Deck C Title	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	2 (3%)	5 (8%)	14 (24%)	29 (45%)	10 (15%)	65
Female	1 (1%)	8 (11%)	21 (28%)	27 (37%)	17 (23%)	74
Total / %	3 (2%)	13 (9%)	40 (29%)	56 (40%)	27 (19%)	139

(Chi-square value 2.434, df 4, sig .656)

Biological Technician Deck D Tools	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	1 (1%)	4 (6%)	27 (42%)	20 (31%)	13 (20%)	65
Female	2 (3%)	14 (19%)	18 (24%)	23 (31%)	17 (23%)	74
Total / %	3 (2%)	18 (13%)	45 (32%)	43 (31%)	30 (22%)	139

(Chi-square value 7.882, df 4, sig .096)

D42A

Management Analyst – Rank #42

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
20	0	0	0	0
19	1	0	1 (1%)	1%
18	2	0	2 (3%)	1%
17	1	0	1 (1%)	1%

Some Interest (Pile 4 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
16	1	0	1 (1%)	1%
15	8	5 (8%)	3 (4%)	6%
14	7	6 (9%)	1 (1%)	5%
13	7	4 (6%)	3 (4%)	5%

No Interest (Pile 3 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
12	11	7 (11%)	4 (5%)	8%
11	21	12 (18%)	9 (12%)	15%
10	18	5 (8%)	13 (18%)	13%
9	21	13 (20%)	8 (11%)	15%

Some Dislike (Pile 2 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
8	18	3 (5%)	15 (20%)	13%
7	4	1 (1%)	3 (4%)	3%
6	10	3 (5%)	7 (10%)	7%
5	6	5 (8%)	1 (1%)	4%

Strong Dislike (Pile 1 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
4	3	1 (1%)	2 (3%)	2%

(Chi-square value 29.013, f 16, sig .024)

D42B

Vocational Card Sort Scores – Management Analyst (Rank #42)

Frequency Distribution Table Series (sig. 00083)*

Management Analyst Deck A Tasks	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	1 (1%)	9 (14%)	18 (28%)	27 (41%)	10 (15%)	65
Female	4 (5%)	6 (8%)	21 (28%)	23 (31)	20 (27%)	74
Total / %	5 (4%)	15 (11%)	39 (28%)	50 (36%)	30 (21%)	139

(Chi-square value 5.725, df 4, sig ..221)

Management Analyst Deck B Workplace	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	0	9 (14%)	25 (38%)	19 (29%)	12 (18%)	65
Female	3 (4%)	12 (16%)	22 (30%)	29 (38%)	9 (12%)	74
Total / %	3 (2%)	21 (15%)	47 (34%)	47 (37%)	21 (15%)	139

(Chi-square value 5.211 df 4, sig .266)

Management Analyst Deck C Title	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	1 (1%)	8 (12%)	29 (40%)	15 (23%)	15 (23%)	65
Female	5 (7%)	7 (10%)	19 (26%)	25 (34%)	18 (14%)	74
Total / %	6 (4%)	15 (11%)	48 (35%)	49 (29%)	33 (24%)	139

(Chi-square value 6.271, df 4, sig ..290)

Management Analyst Deck D Tools	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	8 (12%)	18 (28%)	14 (21%)	13 (20%)	12 (18%)	65
Female	5 (7%)	15 (20%)	17 (23%)	19 (36%)	18 (24%)	74
Total / %	13 (9%)	33 (24%)	31 (22%)	32 (23%)	30 (21%)	139

(Chi-square value 3.695, df 4, sig ..594)

D43A

Database Administrator – Rank #43

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
20	0	0	0	0
19	1	1 (1%)	0	1%
18	1	1 (1%)	0	1%
17	4	4 (6%)	0	3%

Some Interest (Pile 4 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
16	6	3 (5%)	3 (4%)	4%
15	3	0	3 (4%)	2 %
14	5	3 (5%)	2 (3%)	4%
13	9	6 (9%)	3 (4%)	7%

No Interest (Pile 3 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
12	11	8 (12%)	3 (4%)	8%
11	15	6 (9%)	9 (12%)	11%
10	17	7 (11%)	10 (14%)	12%
9	18	8 (12%)	10 (14%)	13%

Some Dislike (Pile 2 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
8	18	7 (11%)	11 (15%)	12%
7	13	4 (6%)	9 (12%)	9%
6	10	5 (8%)	5 (7%)	7%
5	6	2 (3%)	4 (5%)	4%

Strong Dislike (Pile 1 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
4	2	0	2 (3%)	1%

Chi-square value 18.779, df 15, sig .223

D43B

Vocational Card Sort Scores – Database Administrator (Rank #43)

Frequency Distribution Table Series (sig. 00083)*

Database Administrator Deck A Tasks	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	5 (8%)	11 (17%)	19 (29%)	19 (29%)	11 (17%)	65
Female	1 (1%)	4 (5%)	22 (30%)	19 (26%)	28 (38%)	74
Total / %	6 (4%)	15 (11%)	41 (30%)	38 (27%)	39 (28%)	139

(Chi-square value 13.035, df 4, sig .011)

Database Administrator Deck B Workplace	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	3 (5%)	12 (19%)	18 (28%)	17 (26%)	15 (23%)	65
Female	2 (3%)	10 (14%)	19 (26%)	27 (37%)	16 (22%)	74
Total / %	5 (4%)	22 (16%)	37 (27%)	44 (32%)	31 (22%)	139

(Chi-square value 2.140, df 4, sig .710)

Database Administrator Deck C Title	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	2 (3%)	8 (12%)	28 (43%)	19 (29%)	8 (12%)	65
Female	2 (3%)	3 (4%)	17 (23%)	33 (45%)	19 (26%)	74
Total / %	4 (3%)	11 (8%)	45 (32%)	52 (32%)	27 (19%)	139

(Chi-square value 12.683, df 4, sig .013)

Database Administrator Deck D Tools	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	7 (11%)	16 (25%)	15 (23%)	16 (25%)	11 (17%)	65
Female	8 (11%)	10 (14%)	26 (35%)	18 (24%)	12 (16%)	74
Total / %	15 (11%)	26 (19%)	41 (30%)	34 (25%)	23 (17%)	139

(Chi-square value 3.998, df 4, sig .406)

D44A

Logistician – Rank #44

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
20	0	0	0	0
19	0	0	0	0
18	0	0	0	0
17	3	2 (3%)	1 (1%)	2%

Some Interest (Pile 4 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
16	0	0	0	0
15	4	2 (3%)	2 (3%)	3%
14	4	3 (5%)	1 (1%)	3%
13	12	2 (3%)	10 (14%)	9%

No Interest (Pile 3 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
12	20	6 (9%)	14 (19%)	14%
11	23	14 (22%)	9 (12%)	17%
10	18	11 (17%)	7 (10%)	12%
9	11	4 (6%)	7 (10%)	8%

Some Dislike (Pile 2 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
8	17	9 (14%)	8 (11%)	12%
7	10	3 (5%)	7 (10%)	7%
6	9	6 (9%)	3 (4%)	7%
5	5	2 (3%)	3 (4%)	4%

Strong Dislike (Pile 1 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
4	3	1 (1%)	2 (3%)	2%

Chi-square value 16.004, df 15, sig .249

D44B

Vocational Card Sort Scores – Logistician (Rank #44)

Frequency Distribution Table Series (sig. 00083)*

Logistician	5	4	3	2	1	
Deck A Tasks	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	2 (3%)	5 (8%)	22 (34%)	24 (37%)	12 (19%)	65
Female	1 (1%)	5 (7%)	23 (31%)	32 (43%)	13 (18%)	74
Total / %	3 (2%)	10 (7%)	45 (32%)	56 (40%)	25 (18%)	139

(Chi-square value .960, df 4, sig .916)

Logistician	5	4	3	2	1	
Deck B Workplace	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	4 (6%)	6 (9%)	23 (35%)	17 (26%)	15 (23%)	65
Female	5 (7%)	15 (20%)	24 (32%)	21 (28%)	9 (12%)	74
Total / %	9 (7%)	21 (15%)	47 (34%)	38 (27%)	24 (17%)	139

(Chi-square value 5.350, df 4, sig .253)

Logistician	5	4	3	2	1	
Deck C Title	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	0	6 (9%)	25 (39%)	16 (25%)	18 (28%)	65
Female	2 (3%)	5 (7%)	25 (34%)	26 (35%)	16 (22%)	74
Total / %	2 (1%)	11 (8%)	50 (36%)	42 (30%)	34 (25%)	139

(Chi-square value 4.024, df 4, sig .546)

Logistician	5	4	3	2	1	
Deck D Tools	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	8 (12%)	12 (19%)	14 (22%)	19 (29%)	12 (19%)	65
Female	6 (8%)	13 (18%)	23 (31%)	15 (20%)	17 (23%)	74
Total / %	14 (10%)	25 (18%)	37 (27%)	34 (24%)	29 (21%)	139

(Chi-square value 4.571, df 4, sig .470)

D45A

Insurance Examiner / Adjustor – Rank #45

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
20	0	0	0	0
19	1	0	1 (1%)	1%
18	0	0	0	0
17	1	0	1 (1%)	1%

Some Interest (Pile 4 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
16	3	2 (2%)	1 (1%)	2%
15	3	2 (3%)	1 (1%)	2%
14	9	3 (5%)	6 (8%)	7%
13	10	5 (8%)	5 (7%)	7%

No Interest (Pile 3 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
12	13	6 (9%)	7 (10%)	9%
11	19	8 (12%)	11 (15%)	14%
10	15	6 (9%)	9 (12%)	11%
9	25	15 (23%)	10 (14%)	18%

Some Dislike (Pile 2 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
8	12	5 (8%)	7 (10%)	9%
7	9	4 (6%)	3 (7%)	7%
6	11	5 (8%)	6 (8%)	8%
5	5	3 (5%)	2 (3%)	4%

Strong Dislike (Pile 1 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
4	3	1 (1%)	2 (3%)	2%

Chi-square value 6.999, df 15, sig .958

D45B

Vocational Card Sort Scores – Insurance Examiner / Adjustor (Rank #45)

Frequency Distribution Table Series (sig. 00083)*

Insurance Examiner Deck A Tasks	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	1 (1%)	7 (11%)	16 (25%)	20 (31%)	21 (32%)	65
Female	2 (3%)	8 (11%)	21 (28%)	25 (34%)	18 (24%)	74
Total / %	3 (2%)	15 (11%)	37 (27%)	45 (32%)	39 (28%)	139

(Chi-square value 1.285, df 4, sig .864)

Insurance Examiner Deck B Workplace	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	3 (5%)	7 (11%)	24 (37%)	22 (34%)	9 (14%)	65
Female	9 (12%)	17 (23%)	17 (23%)	23 (31%)	8 (11%)	74
Total / %	12 (9%)	24 (17%)	41 (30%)	45 (32%)	17 (12%)	139

(Chi-square value 7.893, df 4, sig .096)

Insurance Examiner Deck C Title	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	1 (1%)	7 (11%)	25 (39%)	15 (23%)	17 (26%)	65
Female	5 (7%)	9 (12%)	16 (22%)	23 (31%)	20 (27%)	74
Total / %	6 (4%)	16 (12%)	41 (30%)	38 (27%)	37 (27%)	139

(Chi-square value 7.267, df 4, sig .201)

Insurance Examiner Deck D Tools	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	4 (6%)	14 (22%)	19 (29%)	16 (25%)	12 (19%)	65
Female	4 (5%)	12 (16%)	19 (24%)	20 (27%)	19 (26%)	74
Total / %	8 (6%)	26 (19%)	38 (27%)	36 (26%)	31 (22%)	139

(Chi-square value 2.634, df 4, sig .756)

D46A

Network Systems Data Analyst – Rank #46

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
20	0	0	0	0
19	1	1 (1%)	0	1%
18	1	1 (1%)	0	1%
17	3	2 (3%)	1 (1%)	2%

Some Interest (Pile 4 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
16	2	1 (1%)	1 (1%)	1%
15	2	2 (3%)	0	1%
14	8	5 (8%)	3 (4%)	6%
13	9	6 (9%)	3 (4%)	7%

No Interest (Pile 3 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
12	10	5 (8%)	5 (7%)	7%
11	15	8 (12%)	7 (10%)	11%
10	19	8 (12%)	11 (15%)	14%
9	24	8 (12%)	16 (22%)	17%

Some Dislike (Pile 2 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
8	19	11 (17%)	8 (11%)	14%
7	12	2 (3%)	10 (14%)	9%
6	8	1 (1%)	7 (10%)	6%
5	4	3 (5%)	1 (1%)	3%

Strong Dislike (Pile 1 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
4	2	1 (1%)	1 (1%)	1%

Chi-square value 19.848, df 15, sig .178

D46B

Vocational Card Sort Scores – Network Systems Data Analyst (Rank #46)

Frequency Distribution Table Series (sig. 00083)*

Data Analyst Deck A Tasks	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	4 (6%)	9 (14%)	16 (25%)	21 (32%)	15 (23%)	65
Female	1 (1%)	7 (10%)	18 (24%)	18 (24%)	30 (41%)	74
Total / %	5 (4%)	16 (12%)	34 (25%)	39 (28%)	45 (32%)	139

(Chi-square value 6.844 , df 4, sig .144.)

Data Analyst Deck B Workplace	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	3 (5%)	16 (25%)	26 (40%)	9 (14%)	11 (17%)	65
Female	10 (14%)	12 (16%)	21 (28%)	22 (30%)	9 (12%)	74
Total / %	13 (9%)	28 (20%)	47 (34%)	31 (22%)	20 (14%)	139

(Chi-square value 9.983, df 4, sig .041)

Data Analyst Deck C Title	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	1 (1%)	12 (19%)	27 (42%)	16 (25%)	9 (14%)	65
Female	0 (1%)	5 (7%)	24 (32%)	21 (28%)	24 (32%)	74
Total / %	1 (1%)	17 (12%)	51 (37%)	37 (27%)	33 (24%)	139

(Chi-square value 11.016 , df 4, sig .026)

Data Analyst Deck D Tools	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	5 (8%)	11 (17%)	15 (23%)	25 (39%)	9 (14%)	65
Female	1 (1%)	3 (4%)	25 (34%)	28 (38%)	17 (23%)	74
Total / %	6 (4%)	14 (10%)	40 (29%)	53 (39%)	26 (19%)	139

(Chi-square value 11.836, df 4, sig .019)

D47A

Computer Software Engineer – Rank #47

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
20	4	3 (5%)	1 (1%)	3%
19	2	2 (3%)	0	1%
18	3	2 (3%)	1 (1%)	2%
17	2	2 (3%)	0	1%

Some Interest (Pile 4 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
16	3	2 (3%)	1 (1%)	2%
15	3	3 (5%)	0	2%
14	7	2 (3%)	5 (7%)	5%
13	7	5 (8%)	2 (3%)	5%

No Interest (Pile 3 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
12	6	5 (8%)	1 (1%)	4%
11	16	10 (15%)	6 (8%)	12%
10	15	5 (8%)	10 (14%)	11%
9	10	3 (5%)	7 (10%)	7%

Some Dislike (Pile 2 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
8	22	7 (11%)	15 (20%)	16%
7	11	2 (3%)	9 (12%)	8%
6	13	5 (8%)	8 (11%)	9%
5	12	7 (11%)	5 (7%)	9%

Strong Dislike (Pile 1 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
4	3	0	3 (4%)	2%

Chi-square value 29.100, df 16, sig .023

D47B

Vocational Card Sort Scores – Computer Software Engineer (Rank #47)

Frequency Distribution Table Series (sig. 00083)*

Computer Engineer Deck A Tasks	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	6 (9%)	11 (17%)	17 (26%)	19 (29%)	12 (19%)	65
Female	3 (4%)	6 (8%)	19 (26%)	20 (27%)	26 (35%)	74
Total / %	9 (7%)	17 (12%)	36 (26%)	39 (28%)	38 (27%)	139

(Chi-square value 7.213, df 4, sig .125)

Computer Engineer Deck B Workplace	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	6 (9%)	10 (15%)	18 (28%)	15 (23%)	16 (25%)	65
Female	3 (4%)	6 (8%)	25 (34%)	21 (28%)	19 (26%)	74
Total / %	9 (7%)	16 (12%)	43 (31%)	36 (26%)	35 (25%)	139

(Chi-square value 3.830, df 4, sig .430)

Computer Engineer Deck C Title	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	7 (11%)	19 (29%)	17 (26%)	9 (14%)	13 (20%)	65
Female	1 (1%)	5 (7%)	8 (11%)	23 (31%)	37 (50%)	74
Total / %	8 (6%)	24 (17%)	25 (18%)	32 (27%)	50 (36%)	139

(Chi-square value 33/108, df 4, sig .000*)

Computer Engineer Deck D Tools	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	5 (8%)	15 (23%)	18 (28%)	14 (22%)	13 (20%)	65
Female	4 (5%)	11 (15%)	22 (30%)	24 (32%)	13 (18%)	74
Total / %	9 (7%)	26 (19%)	40 (29%)	38 (27%)	26 (19%)	139

(Chi-square value 3.184, df 4, sig .527)

D48A

HVAC Operations Maintenance Technician – Rank #48

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
20	0	0	0	0
19	1	1 (1%)	0	1%
18	0	0	0	0
17	4	4 (6%)	0	3%

Some Interest (Pile 4 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
16	7	7 (11%)	0	5%
15	5	5 (8%)	0	4%
14	8	6 (9%)	2 (3%)	6%
13	11	8 (12%)	4 (4%)	8%

No Interest (Pile 3 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
12	8	5 (8%)	3 (4%)	6%
11	10	4 (6%)	6 (8%)	7%
10	16	6 (9%)	10 (14%)	12%
9	17	4 (6%)	13 (18%)	12%

Some Dislike (Pile 2 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
8	14	6 (9%)	8 (11%)	10%
7	13	6 (9%)	7 (10%)	9%
6	10	2 (3%)	8 (11%)	7%
5	10	1 (1%)	9 (12%)	7%

Strong Dislike (Pile 1 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
4	5	0	5 (7%)	3%

Chi-square value 42.897, df 15, sig .000*

D48B

Vocational Card Sort Scores – HVAC Operations Maintenance Technician (Rank #48)

Frequency Distribution Table Series (sig. 00083)*

HVAC Maintenance Deck A Tasks	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	7 (11%)	20 (33%)	13 (20%)	13 (20%)	12 (19%)	65
Female	0	1 (1%)	10 (14%)	17 (23%)	46 (62%)	74
Total / %	7 (5%)	21 (15%)	23 (17%)	30 (22%)	58 (42%)	139

(Chi-square value 44.651, df 4, sig .000)

HVAC Maintenance Deck B Workplace	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	13 (20%)	15 (23%)	16 (25%)	18 (28%)	3 (5%)	65
Female	9 (12%)	10 (14%)	22 (30%)	18 (24%)	15 (20%)	74
Total / %	22 (16%)	25 (18%)	38 (27%)	36 (26%)	18 (13%)	139

(Chi-square value 10.134, df 4, sig .038)

HVAC Maintenance Deck C Title	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	2 (3%)	8 (12%)	21 (32%)	25 (38%)	9 (14%)	65
Female	0	2 (3%)	24 (32%)	21 (28%)	27 (37%)	74
Total / %	2 (1%)	10 (7%)	45 (32%)	46 (33%)	36 (26%)	139

(Chi-square value 14.626, df 4, sig .006)

HVAC Maintenance Deck D Tools	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	11 (17%)	19 (29%)	11 (17%)	14 (22%)	10 (15%)	65
Female	0	5 (7%)	21 (28%)	20 (27%)	28 (38%)	74
Total / %	11 (8%)	24 (17%)	32 (23%)	34 (24%)	38 (27%)	139

(Chi-square value 31.426, df 4, sig .000*)

D49A

Robotics Technician – Rank #49

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
20	5	5 (8%)	0	4%
19	2	2 (3%)	0	1%
18	1	1 (1%)	0	1%
17	3	3 (5%)	0	2 %

Some Interest (Pile 4 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
16	9	9 (14%)	0	7%
15	4	3 (5%)	1 (1%)	3%
14	2	2 (3%)	0	1%
13	7	7 (11%)	0	5%

No Interest (Pile 3 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
12	10	7 (11%)	3 (4%)	7%
11	7	4 (6%)	3 (4%)	5%
10	11	5 (8%)	6 (8%)	8%
9	21	7 (11%)	14 (19%)	15%

Some Dislike (Pile 2 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
8	10	2 (3%)	8 (11%)	7%
7	13	6 (9%)	7 (10%)	9%
6	16	1 (1%)	15 (20%)	12%
5	8	1 (1%)	7 (10%)	6%

Strong Dislike (Pile 1 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
4	10	0	10 (13%)	7%

Chi-square value 64.281, df 16, sig .000*

D49B

Vocational Card Sort Scores – Robotics Technician (Rank #49)

Frequency Distribution Table Series (sig. 00083)*

Robotics Technician Deck A Tasks	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	11 (17%)	19 (29%)	15 (23 %)	11 (17%)	9 (14%)	65
Female	0	4 (5%)	11 (15%)	20 (27%)	39 (53%)	74
Total / %	11 (8%)	23 (16%)	26 (19%)	31 (22%)	48 (34%)	139

(Chi-square value 42.356, df 4, sig .000*)

Robotics Technician Deck B Workplace	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	10 (15%)	17 (26%)	16 (25%)	12 (19%)	10 (15%)	65
Female	0	3 (4%)	9 (12%)	26 (35%)	36 (49%)	74
Total / %	10 (7%)	20 (14%)	25 (18%)	38 (27%)	46 (33%)	139

(Chi-square value 41.204, df 4, sig .000*)

Robotics Technician Deck C Title	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	9 (14%)	16 (25%)	20 (31%)	10 (15%)	10 (15%)	65
Female	0	3 (4%)	16 (22%)	22 (30%)	33 (45%)	74
Total / %	9 (6%)	19 (14%)	36 (26%)	32 (23%)	43 (31%)	139

(Chi-square value 34.704, df 4, sig .000*)

Robotics Technician Deck D Tools	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	19 (30%)	17 (26%)	7 (11%)	15 (23%)	7 (11%)	65
Female	2 (3%)	4 (5%)	22 (30%)	19 (26%)	27 (36%)	74
Total / %	21 (15%)	21 (15%)	29 (21%)	34 (25%)	34 (25%)	139

(Chi-square value 41.394, df 4, sig .000*)

D50A

Urban / Regional Planner – Rank #50

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
20	1	1 (1%)	0	1%
19	0	0	0	0
18	2	1 (1%)	1 (1%)	1%
17	1	0	1 (1%)	1%

Some Interest (Pile 4 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
16	2	0	2 (3%)	1%
15	3	2 (3%)	1 (1%)	2%
14	5	5 (8%)	0	4%
13	6	3 (5%)	5 (7%)	6%

No Interest (Pile 3 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
12	19	7 (11%)	12 (16%)	14%
11	14	7 (11%)	7 (10%)	10%
10	20	12 (19%)	8 (11%)	14%
9	19	7 (11%)	12 (16%)	14%

Some Dislike (Pile 2 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
8	11	6 (9%)	5 (7%)	8%
7	13	3 (5%)	10 (14%)	9%
6	12	9 (13%)	3 (4%)	9%
5	8	2 (3%)	6 (8%)	6%

Strong Dislike (Pile 1 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
4	1	0	1 (1%)	1%

Chi-square value 22.637, df 15, sig .092

D50B

Vocational Card Sort Scores – Urban / Regional Planner (Rank #50)

Frequency Distribution Table Series (sig. 00083)*

Regional Planner Deck A Tasks	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	3 (5%)	9 (14%)	16 (25%)	14 (22%)	23 (35%)	65
Female	10 (14%)	12 (16%)	24 (32%)	12 (16%)	16 (22%)	74
Total / %	13 (9%)	21 (15%)	40 (29%)	26 (19%)	39 (28%)	139

(Chi-square value 6.653, df 4, sig .155)

Regional Planner Deck B Workplace	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	4 (6%)	9 (14%)	18 (28%)	21 (40%)	8 (12%)	65
Female	5 (7%)	4 (5%)	25 (34%)	18 (24%)	22 (25%)	74
Total / %	9 (7%)	13 (9%)	43 (31%)	44 (32%)	30 (22%)	139

(Chi-square value 10.623, df 4, sig .031)

Regional Planner Deck C Title	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	2 (3%)	4 (6%)	26 (40%)	14 (22%)	19 (29%)	65
Female	2 (3%)	7 (10%)	16 (22%)	25 (34%)	24 (32%)	74
Total / %	4 (3%)	11 (8%)	42 (30%)	39 (28%)	43 (31%)	139

(Chi-square value 6.327, df 4, sig .176)

Regional Planner Deck D Tools	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	8 (12%)	14 (22%)	11 (17%)	22 (34%)	10 (15%)	65
Female	3 (4%)	7 (10%)	22 (30%)	24 (32%)	18 (24%)	74
Total / %	11 (8%)	21 (15%)	33 (24%)	46 (33%)	28 (20%)	139

(Chi-square value 10.105, df 4, sig .039)

D51A

Land Surveyor – Rank #51

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
20	2	2 (3%)	0	3%
19	2	2 (3%)	0	1%
18	1	1 (1%)	0	1%
17	4	4 (6%)	0	3%

Some Interest (Pile 4 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
16	2	2 (3%)	1 (1%)	1%
15	7	6 (9%)	1 (1%)	5%
14	7	4 (6%)	3 (4%)	5%
13	7	5 (8%)	2 (3%)	5%

No Interest (Pile 3 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
12	11	7 (11%)	4 (5%)	8%
11	10	6 (9%)	4 (5%)	7%
10	16	9 (14%)	7 (10%)	12%
9	13	7 (11%)	6 (8%)	9%

Some Dislike (Pile 2 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
8	12	2 (3%)	10 (14%)	9%
7	14	5 (8%)	9 (12%)	10%
6	14	2 (3%)	12 (16%)	10%
5	10	1 (1%)	9 (12%)	7%

Strong Dislike (Pile 1 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
4	7	0	7 (10%)	5%

Chi-square value 44.167, df 16, sig .000*

D51B

Vocational Card Sort Scores – Land Surveyor (Rank #51)

Frequency Distribution Table Series (sig. 00083)*

Land Surveyor Deck A Tasks	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	6 (9%)	8 (12%)	20 (31%)	21 (32%)	10 (15%)	65
Female	1 (1%)	3 (4%)	13 (18%)	24 (32%)	33 (44%)	74
Total / %	7 (5%)	11 (8%)	33 (24%)	45 (32%)	43 (31%)	139

(Chi-square value 19.330, df 4, sig .001)

Land Surveyor Deck B Workplace	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	13 (20%)	15 (23%)	18 (28%)	10 (15%)	9 (14%)	65
Female	2 (3%)	6 (8%)	13 (18%)	24 (32%)	29 (40%)	74
Total / %	15 (11%)	21 (15%)	31 (22%)	34 (25%)	38 (27%)	139

(Chi-square value 28.558, df 4, sig .000*)

Land Surveyor Deck C Title	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	6 (9%)	16 (25%)	19 (29%)	16 (25%)	8 (12%)	65
Female	1 (1%)	5 (7%)	17 (23%)	22 (30%)	28 (38%)	74
Total / %	7 (5%)	21 (15%)	36 (26%)	38 (27%)	36 (26%)	139

(Chi-square value 22.012, df 4, sig .001)

Land Surveyor Deck D Tools	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	10 (15%)	18 (28%)	14 (22%)	17 (26%)	6 (4%)	65
Female	0	2 (3%)	21 (28%)	26 (35%)	23 (34%)	74
Total / %	10 (7%)	20 (14%)	35 (25%)	43 (31%)	31 (22%)	139

(Chi-square value 37.303, df 4, sig .000*)

D52A

Wind Energy Engineer – Rank #52

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
20	2	2 (3%)	0	1%
19	2	1 (1%)	1 (1%)	1%
18	2	2 (3%)	0	1%
17	2	2 (3%)	0	1%

Some Interest (Pile 4 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
16	5	5 (8%)	0	4%
15	1	1 (1%)	0	1%
14	8	7 (11%)	1 (1%)	6%
13	13	11 (17%)	2 (3%)	9%

No Interest (Pile 3 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
12	10	5 (8%)	5 (7%)	7%
11	7	1 (1%)	6 (8%)	5%
10	8	4 (5%)	4 (5%)	6%
9	13	7 (11%)	6 (8%)	9%

Some Dislike (Pile 2 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
8	22	6 (10%)	16 (22%)	16%
7	20	7 (11%)	13 (18%)	14%
6	7	1 (1%)	6 (8%)	5%
5	6	1 (1%)	5 (7%)	4%

Strong Dislike (Pile 1 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
4	11	2 (3%)	9 (12%)	8%

Chi-square value 43.014, df 17, sig. 000*

D52B

Vocational Card Sort Scores – Wind Energy Engineer (Rank #52)

Frequency Distribution Table Series (sig. 00083)*

Wind Energy Deck A Tasks	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	9 (14%)	11 (17%)	17 (26%)	19 (29%)	7 (14%)	65
Female	2 (3%)	3 (4%)	16 (22%)	19 (26%)	34 (46%)	74
Total / %	11 (8%)	14 (10%)	33 (24%)	38 (27%)	43 (31%)	139

(Chi-square value 23.105, df 4, sig .000*)

Wind Energy Deck B Workplace	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	7 (11%)	14 (22%)	18 (28%)	12 (19%)	14 (22%)	65
Female	3 (4%)	5 (7%)	13 (18%)	22 (30%)	31 (42%)	74
Total / %	10 (7%)	19 (14%)	31 (22%)	34 (24%)	45 (32%)	139

(Chi-square value 15.515, df 4, sig .004)

Wind Energy Deck C Title	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	4 (6%)	20 (31%)	18 (28%)	16 (25%)	7 (11%)	65
Female	0	3 (4%)	17 (23%)	13 (18%)	41 (55%)	74
Total / %	4 (3%)	23 (17%)	35 (25%)	29 (21%)	48 (35%)	139

(Chi-square value 40.575, df 4, sig .000*)

Wind Energy Deck D Tools	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	10 (15%)	16 (25%)	11 (17%)	17 (26%)	11 (17%)	65
Female	3 (4%)	12 (16%)	16 (22%)	20 (27%)	23 (31%)	74
Total / %	13 (9%)	29 (20%)	27 (19%)	37 (27%)	34 (25%)	139

(Chi-square value 9.201, df 4, sig .056)

D53A

Truck Driver – Rank #53

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
20	4	4 (6%)	0	3%
19	2	2 (3%)	0	1%
18	3	2 (3%)	1 (1%)	2%
17	7	7 (11%)	0	5%

Some Interest (Pile 4 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
16	5	5 (8%)	0	4%
15	4	3 (5%)	1 (1%)	3%
14	5	4 (6%)	1 (1%)	4%
13	8	2 (3%)	6 (8%)	6%

No Interest (Pile 3 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
12	8	6 (9%)	2 (3%)	6%
11	5	2 (3%)	3 (4%)	4%
10	13	7 (11%)	6 (8%)	9%
9	7	3 (5%)	4 (5%)	5%

Some Dislike (Pile 2 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
8	12	3 (5%)	9 (12%)	9%
7	15	7 (11%)	8 (11%)	11%
6	10	3 (5%)	7 (10%)	7%
5	13	2 (3%)	11 (15%)	9%

Strong Dislike (Pile 1 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
4	18	3 (5%)	15 (20%)	13%

Chi-square value 44.052, df 16, sig .000*

D53B

Vocational Card Sort Scores – Truck Driver (Rank #53)

Frequency Distribution Table Series (sig. 00083)*

Truck Driver Deck A Tasks	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	13 (20%)	15 (23%)	9 (14%)	13 (20%)	15 (23%)	65
Female	3 (4%)	4 (5%)	13 (18%)	13 (18%)	41 (55%)	74
Total / %	16 (12%)	19 (14%)	22 (16%)	26 (19%)	56 (40%)	139

(Chi-square value 24.439, df 4, sig .000*)

Truck Driver Deck B Workplace	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	9 (14%)	17 (26%)	13 (20%)	13 (20%)	13 (20%)	65
Female	2 (3%)	10 (14%)	13 (18%)	15 (20%)	34 (46%)	74
Total / %	11 (8%)	27 (19%)	26 (19%)	28 (20%)	47 (34%)	139

(Chi-square value 15.277, df 4, sig .004)

Truck Driver Deck C Title	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	8 (12%)	19 (29%)	16 (25%)	12 (19%)	10 (15%)	65
Female	1 (1%)	6 (8%)	13 (18%)	13 (18%)	41 (55%)	74
Total / %	9 (7%)	25 (18%)	29 (21%)	25 (18%)	51 (37%)	139

(Chi-square value 34.495, df 4, sig .000*)

Truck Driver Deck D Tools	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	11 (17%)	20 (31%)	10 (15%)	12 (19%)	12 (19%)	65
Female	1 (1%)	5 (7%)	14 (19%)	18 (24%)	36 (49%)	74
Total / %	12 (9%)	25 (18%)	24 (17%)	30 (22%)	48 (35%)	139

(Chi-square value 30.746, df 4, sig .000*)

D54A

Green Product Marketer – Rank #54

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
20	0	0	0	0
19	2	1 (1%)	1 (1%)	1%
18	1	1 (1%)	0	1%
17	0	0	0	0

Some Interest (Pile 4 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
16	1	1 (1%)	0	1%
15	3	2 (2%)	1 (1%)	2%
14	2	1 (1%)	1 (1%)	1%
13	5	3 (5%)	2 (3%)	4%

No Interest (Pile 3 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
12	17	8 (12%)	9 (12%)	12%
11	18	9 (14%)	9 (14%)	14%
10	20	10 (15%)	10 (14%)	14%
9	15	6 (9%)	9 (12%)	11%

Some Dislike (Pile 2 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
8	12	5 (8%)	7 (10%)	9%
7	24	11 (17%)	13 (18%)	17%
6	6	3 (5%)	3 (4%)	4%
5	9	3 (5%)	6 (8%)	7%

Strong Dislike (Pile 1 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
4	3	1 (1%)	2 (3%)	2%

Chi-square value 5.184, df 15, sig .990

D54B

Vocational Card Sort Scores – Green Product Marketer (Rank #54)

Frequency Distribution Table Series (sig. 00083)*

Green Marketer Deck A Tasks	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	2 (3%)	5 (8%)	23 (35%)	24 (37%)	11 (17%)	65
Female	3 (4%)	4 (5%)	20 (27%)	22 (30%)	25 (34%)	74
Total / %	5 (4%)	9 (7%)	43 (31%)	46 (33%)	36 (26%)	139

(Chi-square value 5.492, df 4, sig .240)

Green Marketer Deck B Workplace	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	4 (6%)	10 (15%)	19 (29%)	18 (28%)	14 (22%)	65
Female	3 (4%)	3 (4%)	16 (22%)	30 (41%)	22 (30%)	74
Total / %	7 (5%)	13 (9%)	35 (25%)	48 (35%)	36 (26%)	139

(Chi-square value 8.349, df 4, sig .078)

Green Marketer Deck C Title	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	0	4 (6%)	29 (45%)	19 (29%)	13 (20%)	65
Female	1 (1%)	2 (3%)	23 (31%)	29 (39%)	19 (26%)	74
Total / %	1 (1%)	6 (4%)	52 (37%)	48 (35%)	32 (23%)	139

(Chi-square value 5.006, df 4, sig .287)

Green Marketer Deck D Tools	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	6 (9%)	10 (15%)	14 (22%)	17 (26%)	18 (28%)	65
Female	6 (8%)	15 (20%)	23 (31%)	11 (15%)	19 (26%)	74
Total / %	12 (9%)	25 (18%)	37 (27%)	26 (20%)	37 (27%)	139

(Chi-square value 4.913, df 4, sig .427)

D55A

Solar Energy Systems Engineer – Rank #55

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
20	1	1 (1%)	0	1%
19	0	0	0	0
18	2	1 (1%)	1 (1%)	1%
17	0	0	0	0

Some Interest (Pile 4 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
16	4	4 (6%)	0	3%
15	3	2 (3%)	1 (1%)	2%
14	5	4 (6%)	1 (1%)	3%
13	3	3 (5%)	0	2%

No Interest (Pile 3 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
12	14	10 (15%)	4 (5%)	10%
11	15	8 (12%)	7 (10%)	11%
10	11	7 (11%)	4 (5%)	8%
9	17	7 (11%)	10 (14%)	12%

Some Dislike (Pile 2 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
8	20	10 (15%)	10 (14%)	14%
7	17	3 (5%)	14 (19%)	12%
6	13	3 (5%)	10 (14%)	9%
5	9	2 (3%)	7 (10%)	7%

Strong Dislike (Pile 1 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
4	5	0	5 (7%)	4%

Chi-square value 32.337, df 15, sig. 000*

D55B

Vocational Card Sort Scores – Solar Energy Engineer (Rank #55)

Frequency Distribution Table Series (sig. 00083)*

Solar Energy Engineer Deck A Tasks	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	1 (1%)	11 (17%)	23 (35%)	20 (31%)	10 (15%)	65
Female	0	5 (7%)	16 (22%)	25 (34%)	28 (38%)	74
Total / %	1 (1%)	16 (12%)	39 (28%)	45 (32%)	38 (27%)	139

(Chi-square value 13.060,, df 4, sig .011)

Solar Energy Engineer Deck B Workplace	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	3 (5%)	10 (15%)	30 (46%)	14 (22%)	8 (12%)	65
Female	2 (3%)	3 (4%)	10 (14%)	26 (35%)	33 (45%)	74
Total / %	5 (4%)	13 (9%)	40 (39%)	40 (29%)	41 (30%)	139

(Chi-square value 32.366, df 4, sig .000*)

Solar Energy Engineer Deck C Title	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	3 (5%)	18 (28%)	11 (17%)	18 (28%)	15 (23%)	65
Female	0	3 (4%)	15 (20%)	18 (24%)	38 (51%)	74
Total / %	3 (2%)	21 (15%)	26 (19%)	36 (26%)	53 (38%)	139

(Chi-square value 23.828, df 4, sig .000*)

Solar Energy Engineer Deck D Tools	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	6 (9%)	12 (19%)	18 (28%)	19 (29%)	10 (15%)	65
Female	5 (7%)	9 (12%)	20 (27%)	20 (27%)	20 (27%)	74
Total / %	11 (8%)	21 (15%)	38 (27%)	39 (28%)	30 (22%)	139

(Chi-square value 3.415, df 4, sig .491)

D56A

Chemical Engineer – Rank #56

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
20	0	0	0	0
19	0	0	0	0
18	0	0	0	0
17	2	2 (3%)	0	1%

Some Interest (Pile 4 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
16	5	3 (5%)	2 (3%)	4%
15	2	1 (1%)	1 (1%)	1%
14	3	1 (1%)	2 (3%)	2%
13	8	4 (6%)	4 (5%)	6%

No Interest (Pile 3 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
12	12	7 (11%)	5 (7%)	9%
11	13	9 (14%)	4 (5%)	9%
10	18	5 (8%)	13 (18%)	13%
9	13	8 (12%)	5 (7%)	9%

Some Dislike (Pile 2 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
8	21	11 (17%)	10 (14%)	15%
7	16	7 (11%)	9 (12%)	12%
6	13	5 (8%)	8 (11%)	9%
5	7	1 (1%)	6 (8%)	5%

Strong Dislike (Pile 1 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
4	6	1 (1%)	5 (7%)	4%

Chi-square value 15.749, df 15, sig .263

D56B

Vocational Card Sort Scores – Chemical Engineer (Rank #56)

Frequency Distribution Table Series (sig. 00083)*

Chemical Engineer Deck A Tasks	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	2 (3%)	7 (11%)	22 (34%)	27 (42%)	7 (11%)	65
Female	0	12 (9%)	42 (30%)	52 (57%)	31 (22%)	74
Total / %	2 (1%)	12 (9%)	42 (30%)	52 (37%)	31 (22%)	139

(Chi-square value 11.293, df 4, sig .023)

Chemical Engineer Deck B Workplace	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	1 (1%)	10 (15%)	17 (26%)	20 (31%)	17 (26%)	65
Female	4 (5%)	7 (10%)	23 (31%)	17 (23%)	23 (31%)	74
Total / %	5 (4%)	17 (12%)	40 (29%)	37 (27%)	40 (29%)	139

(Chi-square value 3.806, df 4, sig .433)

Chemical Engineer Deck C Title	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	4 (6%)	12 (19%)	16 (25%)	21 (32%)	12 (19%)	65
Female	0	6 (8%)	22 (30%)	18 (24%)	28 (38%)	74
Total / %	4 (3%)	18 (13%)	38 (27%)	39 (28%)	40 (29%)	139

(Chi-square value 13.050, df 4, sig .011)

Chemical Engineer Deck D Tools	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	1 (1%)	7 (11%)	21 (32%)	19 (29%)	17 (26%)	65
Female	3 (4%)	7 (10%)	19 (26%)	20 (27%)	25 (34%)	74
Total / %	4 (3%)	14 (10%)	40 (29%)	39 (28%)	42 (30%)	139

(Chi-square value 2.075, df 4, sig .722)

D57A

Railroad Conductor / Yardmaster – Rank #57

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
20	2	2 (3%)	0	1%
19	0	0	0	0
18	1	1 (1%)	0	1%
17	5	5 (8%)	0	4%

Some Interest (Pile 4 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
16	3	3 (5%)	0	2%
15	3	3 (5%)	0	2%
14	7	7 (11%)	0	5%
13	6	4 (6%)	2 (3%)	4%

No Interest (Pile 3 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
12	7	3 (5%)	4 (5%)	5%
11	6	5 (8%)	1 (1%)	4%
10	18	8 (12%)	10 (14%)	13%
9	9	4 (6%)	5 (7%)	7%

Some Dislike (Pile 2 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
8	13	5 (8%)	8 (11%)	9%
7	17	5 (8%)	12 (16%)	12%
6	15	6 (9%)	9 (12%)	11%
5	14	2 (3%)	12 (16%)	10%

Strong Dislike (Pile 1 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
4	13	2 (3%)	11 (15%)	9%

Chi-square 42.054, df 16, sig .000*

D57B

Vocational Card Sort Scores – Railroad Conductor / Yardmaster (Rank #57)

Frequency Distribution Table Series (sig. 00083)*

Railroad Conductor Deck A Tasks	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	7 (11%)	15 (23%)	17 (26%)	14 (22%)	12 (19%)	65
Female	0	2 (3%)	17 (23%)	24 (32%)	31 (42%)	74
Total / %	7 (5%)	17 (12%)	34 (25%)	38 (27%)	43 (31%)	139

(Chi-square value 27.501, df 4, sig .000*)

Railroad Conductor Deck B Workplace	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	6 (9%)	10 (15%)	20 (31%)	20 (31%)	9 (14%)	65
Female	0	2 (3%)	14 (19%)	27 (37%)	31 (42%)	74
Total / %	6 (4%)	12 (9%)	34 (25%)	47 (34%)	40 (29%)	139

(Chi-square value 25.057, df 4, sig .000*)

Railroad Conductor Deck C Title	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	6 (9%)	15 (23%)	20 (31%)	11 (17%)	12 (20%)	65
Female	0	1 (1%)	12 (16%)	20 (27%)	41 (55%)	74
Total / %	6 (4%)	16 (12%)	32 (23%)	31 (22%)	54 (39%)	139

(Chi-square value 36.954, df 4, sig .000*)

Railroad Conductor Deck D Tools	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	7 (11%)	10 (15%)	18 (28%)	11 (17%)	14 (29%)	65
Female	0	3 (4%)	17 (23%)	27 (37%)	25 (35%)	74
Total / %	7 (5%)	13 (9%)	35 (25%)	38 (27%)	45 (32%)	139

(Chi-square value 19.121, df 4, sig .002)

D58A

Environmental Scientist – Rank #58

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
20	0	0	0	0
19	0	0	0	0
18	2	1 (1%)	1 (1%)	1%
17	0	0	0	0

Some Interest (Pile 4 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
16	3	1 (1%)	2 (3%)	2%
15	1	1 (1%)	0	1%
14	4	2 (3%)	2 (3%)	3%
13	5	4 (6%)	1 (1%)	4%

No Interest (Pile 3 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
12	14	6 (9%)	8 (10%)	10%
11	12	6 (9%)	6 (8%)	9%
10	13	8 (12%)	5 (7%)	9%
9	18	9 (14%)	9 (12%)	13%

Some Dislike (Pile 2 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
8	18	8 (12%)	10 (14%)	13%
7	19	9 (14%)	10 (14%)	14%
6	14	6 (9%)	8 (11%)	10%
5	11	3 (5%)	8 (11%)	8%

Strong Dislike (Pile 1 cards)	Total Scores	Male Scores	Female Scores	Percentage of Youth
4	5	1 (1%)	4 (6%)	4%

Chi-square value 8.732, df 15, sig .891

D58B

Vocational Card Sort Scores – Environmental Scientist (Rank #58)

Frequency Distribution Table Series (sig. 00083)*

Environmental Scientist Deck A Tasks	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	3 (5%)	27(11%)	14 (22%)	24 (37%)	17 (26%)	65
Female	5 (7%)	7 (10%)	17 (23%)	29 (39%)	16 (22%)	74
Total / %	8 (6%)	14 (10%)	31 (22%)	53 (38%)	33 (23.7)	139

(Chi-square value .713, df 4, sig .950)

Environmental Scientist Deck B Workplace	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	1 (1%)	2 (3%)	20 (31%)	21 (32%)	21 (32%)	65
Female	1 (1%)	3 (4%)	16 (22%)	25 (34%)	29 (39)	74
Total / %	2 (1%)	5 (4%)	36 (26%)	46 (33%)	50 (36%)	139

(Chi-square value 1.697, df 4, sig .791)

Environmental Scientist Deck C Title	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	3 (5%)	9 (14%)	19 (29%)	23 (35%)	11 (17%)	65
Female	4 (5%)	12 (16%)	15 (20%)	20 (27%)	23 (31%)	74
Total / %	7 (5%)	21 (15%)	34 (25)	43 (31%)	34 (25%)	139

(Chi-square value 4.925, df 4, sig .295)

Environmental Scientist Deck D Tools	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	0	14 (22%)	16 (25%)	23 (35%)	12 (18%)	65
Female	2 (3%)	5 (7%)	15 (20%)	22 (30%)	30 (41%)	74
Total / %	2 (1%)	19 (14%)	31 (22%)	45 (32%)	42 (30%)	139

(Chi-square value 13.506, df 4, sig .009)

D59A

Hazardous Waste Removal Technician – Rank #59

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
20	0	0	0	0
19	0	0	0	0
18	0	0	0	0
17	3	1 (1%)	2 (3%)	2%

Some Interest (Pile 4 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
16	4	4 (6%)	0	3%
15	2	0	2 (3%)	1%
14	6	5 (8%)	1 (1%)	4%
13	10	7 (11%)	3 (4%)	7%

No Interest (Pile 3 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
12	12	7 (11%)	5 (7%)	9%
11	10	4 (6%)	6 (8%)	7%
10	9	6 (9%)	3 (4%)	7%
9	10	4 (6%)	6 (8%)	7%

Some Dislike (Pile 2 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
8	11	4 (6%)	7 (10%)	8%
7	16	7 (11%)	9 (12%)	12%
6	16	8 (12%)	8 (11%)	12%
5	16	4 (6%)	12 (16%)	12%

Strong Dislike (Pile 1 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
4	14	4 (6%)	10 (14%)	10%

Chi-square value 20.227, df 14, sig .123

D59B

Vocational Card Sort Scores – Hazardous Waste Removal Worker (Rank #59)

Frequency Distribution Table Series (sig. 00083)*

Hazardous Waste Removal Deck A Tasks	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	1 (1%)	13 (20%)	16 (25%)	21 (32%)	14 (22%)	65
Female	3 (4%)	5 (7%)	19 (26%)	21 (20%)	26 (35%)	74
Total / %	4 (3%)	18 (13%)	35 (25%)	42 (30%)	40 (29%)	139

(Chi-square value 7.843, df 4, sig .097)

Hazardous Waste Removal Deck B Workplace	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	1 (1%)	17 (26%)	14 (22%)	11 (17%)	22 (33%)	65
Female	2 (3%)	4 (5%)	15 (20%)	19 (26%)	39 (46%)	74
Total / %	3 (2%)	21 (15%)	29 (21%)	30 (22%)	56 (40%)	139

(Chi-square value 12.596, df 4, sig .013)

Hazardous Waste Removal Deck C Title	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	0	13 (20%)	13 (20%)	21 (32%)	18 (28%)	65
Female	3 (4%)	5 (7%)	16 (22%)	11 (15%)	39 (33%)	74
Total / %	3 (2%)	18 (13%)	29 (21%)	32 (23%)	57 (41%)	139

(Chi-square value 17.217, df 4, sig .002)

Hazardous Waste Removal Deck D Tools	5 Strong Interest	4 Some Interest	3 No Interest	2 Dislike	1 Strong Dislike	Total Selections
Male	0	15 (23%)	14 (22%)	21 (32%)	13 (23%)	65
Female	1 (1%)	8 (11%)	14 (19%)	17 (23%)	34 (46%)	74
Total / %	1 (1%)	23 (17%)	28 (20%)	38 (27%)	49 (35%)	139

(Chi-square value 10.380, df 4, sig .034)

D60A

Hydrologist – Rank #60

Frequency Distribution of Total Occupational Interest Scores (sig. 00083)*

Strong Interest (Pile 5 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
20	1	0	1 (1%)	1%
19	0	0	0	0
18	2	1 (1%)	1 (1%)	1%
17	0	0	0	0

Some Interest (Pile 4 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
16	6	1 (1%)	5 (7%)	4%
15	8	1 (1%)	7 (10%)	6%
14	12	2 (3%)	10 (14%)	9%
13	7	5 (8%)	2 (3%)	5%

No Interest (Pile 3 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
12	15	4 (6%)	11 (15%)	11%
11	15	8 (12%)	7 (10%)	11%
10	11	7 (11%)	4 (5%)	8%
9	22	14 (22%)	8 (11%)	16%

Some Dislike (Pile 2 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
8	10	6 (9%)	4 (5%)	7%
7	15	12 (19%)	3 (4%)	11%
6	15	12 (19%)	3 (4%)	11%
5	3	1 (1%)	2 (3%)	2%

Strong Dislike (Pile 1 cards)	Total Sample N = 139	Male Youth N = 65	Female Youth N = 74	Percentage % Of Sample
4	2	1 (1%)	1 (1%)	1%

Chi-square value 29.841, df 14, sig .008

D60B

Vocational Card Sort Scores – Hydrologist (Rank #60)

Frequency Distribution Table Series (sig. 00083)*

Hydrologist	5	4	3	2	1	
Deck A Tasks	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	2 (3%)	6 (4%)	14 (22%)	28 (43%)	15 (23%)	65
Female	10 (14%)	18 (24%)	20 (27%)	13 (18%)	13 (18%)	74
Total / %	12 (9%)	24 (17%)	34 (25%)	41 (30%)	28 (20%)	139

(Chi-square value 17.514, df 4, sig ..002)

Hydrologist	5	4	3	2	1	
Deck B Workplace	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	0	4 (6%)	22 (34%)	28 (43%)	11 (17%)	65
Female	12 (16%)	22 (30%)	22 (30%)	11 (15%)	7 (10%)	74
Total / %	12 (9%)	26 (19%)	44 (32%)	39 (28%)	18 (13%)	139

(Chi-square value 32.313, df 4, sig . 000*)

Hydrologist	5	4	3	2	1	
Deck C Title	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	2 (3%)	4 (6%)	15 (23%)	25 (39%)	19 (29%)	65
Female	7 (10%)	17 (23%)	19 (23%)	17 (23%)	14 (19%)	74
Total / %	9 (7%)	21 (15%)	34 (25%)	42 (30%)	33 (24%)	139

(Chi-square value 13.049, df 4, sig ..011)

Hydrologist	5	4	3	2	1	
Deck D Tools	Strong Interest	Some Interest	No Interest	Dislike	Strong Dislike	Total Selections
Male	3 (5%)	4 (6%)	18 (28%)	29 (45%)	11 (17%)	65
Female	1 (1%)	3 (6%)	25 (34%)	29 (34%)	16 (22%)	74
Total / %	4 (3%)	7 (5%)	43 (31%)	58 (42%)	27 (19%)	139

(Chi-square value 2.637, df 4, sig .620)

APPENDIX E

Vocational Card Decks

1A Tasks

Perform therapeutic procedures on patients, such as injections, immunizations, suturing, and wound care.

Conduct physicals, provide treatments, and counsel patients.

60A Tasks

Administer hearing or speech and language evaluations, tests, or examinations, to determine degree of Impairment.

1B Environment

Work in a hospital, physician office, or surgery center.

Assist physicians with complicated medical procedures.

60B Environment

Assess and treat patients with speech, language, voice, and fluency disorders.

Develop individual or group activities.

1C Title SIR

Physician Assistant

Code 29-1071.00

60C Title SIA

Speech Language Pathologist

Code 29-1127.00

2A Tasks

Analyze, design, test, and evaluate network systems, such as Local Area Networks (LAN), Wide Area Networks, and Internet connections.

3A Tasks

Determine and formulate policies and provide the overall direction of a company, or public or private service organization.

2B Environment

Work in an office environment and interact with computers to service and train co-workers and clients.

3B Environment

Plan, direct, or coordinate operational activities at the highest level of management, with the help of subordinate executives and staff managers.

2C Title ICR

Network Systems and Data Communications Analyst

Code 15-1081.00

3C Title EC

Chief Executive Officer

Code 11-1011.00

4A Tasks

Assist clients in identifying benefits and Social services and Help clients obtain them.

Interview individuals and family members for educational, social, & employment history.

4B Environment

Work in diverse settings; including hospitals, prisons, schools, or private practice.

Assist professionals from psychology, rehabilitation, and social work.

4C Title CSE

Social and Human Service Assistant

Code 29-1093.00

5A Tasks

Direct activities such as autopsies, pathological and toxicological analyses and inquests relating to investigations of death, to determine cause of death.

5B Environment

Perform examinations and autopsies, including to identify victims, locate signs of trauma, and identify factors which indicate time and cause of death.

5C Title IRC

Coroner

Code 13-1041.06

6A Tasks

Review medical records for completeness, accuracy, and compliance with regulations.

Retrieve patient medical records for physicians.

6B Environment

Compile, process, And maintain Medical records Of a hospital and Clinic patients.

Work in hospital, Physician office, Or surgery center Environment.

6C Title CE

Medical Records and Health Information Technician

Code 29-2071.00

7A Tasks

Set up, operate, and maintain laboratory instruments, and equipment.

Monitor experiments, make observations, and calculate and record results.

7B Environment

Assist biological and medical scientists in laboratories.

May analyze organic substances, such as blood, food, and drugs.

7C Title RIC

Biological Technician

Code 19-4021.00

8A Tasks

Determine patient's X-ray needs by reading requests from physicians.

Position patient on examining table; & set up and adjust equipment to obtain X-ray.

8B Environment

Maintain and use equipment and supplies necessary to demonstrate portions of the human body on X-ray film.

Work in a hospital setting.

8C Title RC

Radiological Technician

Code 29-2034.00

9A Tasks

Develop, create, and modify general computer applications and software.

Design software or customize hardware for client use.

9B Environment

May analyze and design databases within a computer application area.

May work independently, or on a project team.

Extensive interaction with computers.

9C Title IRC

Computer Software Engineer

Code 15-1031.00

<p>10A Tasks</p> <p>Assess, plan, organize, and participate in rehabilitation programs that improve mobility, relieve pain, increase strength, and decrease suffering.</p>	<p>10B Environment</p> <p>Work in Hospitals, Rehabilitation centers, Universities, or for Sports teams.</p> <p>Work in a practice, or on a team with other providers.</p>	<p>10C Title SIR</p> <p>Physical Therapist</p> <p>Code 29-1123.00</p>
<p>11A Tasks</p> <p>Diagnose, treat, and help prevent disease and injuries that commonly occur in the general population.</p>	<p>11B Environment</p> <p>Prescribe or administer treatment, therapy, medications, vaccinations, and medical care in a private practice, or hospital setting.</p>	<p>11C Title IS</p> <p>Family and General Practitioner</p> <p>Medical Doctor</p> <p>Code 29-1062.00</p>

12A Tasks

Collect, analyze, and interpret information provided by geodetic surveys, aerial photographs, and satellite data.

Research, study, and design maps.

13A Tasks

Perform medical tests in a laboratory environment for use in the treatment and diagnosis of disease and injury in animals.

12B Environment

Interacting with computers and cameras.

Working both indoors and outdoors to capture, process and analyze information.

13B Environment

Work with animals and caretakers of animals.

Work in a Veterinary clinic, animal hospital, or animal facility.

12C Title RIC

Cartographer and Photogrammetrist

Code 17-1021.00

13C Title RI

Veterinary Technologist Or Technician

Code 29-2056.00

14A Tasks

Assess injuries, administer emergency medical care, and extricate trapped individuals. Administer first-aid and life-support to those sick and injured.

15A Tasks

Clean teeth and Examine oral areas.

Educate patients On oral hygiene, Take and develop x-rays, and apply fluoride or sealants.

14B Environment

Transport sick or injured persons to medical facilities. Drive an ambulance. Respond to accident scenes.

15B Environment

Work in a dentist office.

Perform some tasks independently, and some tasks working with a dentist.

14C Title SIR

Emergency Medical Technician and Paramedic

Code 29-2041.00

15C Title SRC

Dental Hygienist

Code 29-2021.00

16A Tasks

Direct the preparation, seasoning, and cooking of salads, soups, fish, meats, vegetables, and desserts for restaurants.

17A Tasks

Conduct investigations to solve criminal cases.

Note, mark, and photograph locations of objects found at crime scenes.

16B Environment

Work in a professional kitchen setting.

Supervise and direct cooks.

Work with clients to plan menus and recipes.

17B Environment

Examine crime scenes to obtain clues and evidence.

Obtain evidence from suspects and witnesses.

16C Title ERA

Chef and Head Cook

Code 35-1011.00

17C Title EI

Police Detective

Code 33-3021.01

18A Tasks Advise clients on financial plans utilizing knowledge of tax and investment strategies, securities, insurance, pension plans, and real estate.	18B Environment Work in a diverse number of settings, including consultative practice, or working for banks, law firms, and investment firms.	18C Title ECS Personal Financial Advisor Code 13-2052.00
19A Tasks Coordinate changes to computer databases; test and implement database management systems; and plan, coordinate, and implement security measures to safeguard computers.	19B Environment Work and interact extensively with computers. Work as a part of a project team to coordinate database development.	19C Title CI Database Administrator Code 15-1061.00

20A Tasks	20B Environment	20C Title RI
Build, install, test, and maintain robotic equipment or related automated production systems.	Build or assemble robotic devices or systems.	Robotics Technician
	Install, program, and repair robot controllers, and end-of-arm tools.	Code 17-3024.01
21A Tasks	21B Environment	21C Title RI
Examine vehicles to determine extent of damage or malfunction.	Work in automobile repair shop, for automobile dealer, or as independent mechanic in own business setting.	Automobile Service Master Mechanic
Repair automobiles, trucks, buses, and other vehicles.		Code 49-3023.01

<p>22A Tasks</p> <p>Plan and design structures, such as private residencies, office buildings, theaters, factories, and other structural property.</p>	<p>22B Environment</p> <p>Prepare scale drawings for clients.</p> <p>Plan and direct activities of workers engaged in preparing drawing and build designs.</p>	<p>22C Title AI</p> <p>Architect</p> <p>Code 17-1011.00</p>
<p>23A Tasks</p> <p>Assess patient health problems and needs, implement nursing care plans, and administer nursing care to ill, injured, convalescent, & disabled patients.</p>	<p>23B Environment</p> <p>Work in a health care settings, such as a hospital, physician office, nursing home, surgery center, home-based care, or private practice.</p>	<p>23C Title SIC</p> <p>Registered Nurse</p> <p>Code 29-1111.00</p>

24A Tasks

Plan, direct, or coordinate activities of an organization or department that provides overnight lodging and accommodations to guests.

25A Tasks

Oversee a sales crew and lead the selling of merchandise, such as furniture, motor vehicles, appliances, or apparel in a retail environment.

24B Environment

Greet and register guests.

Work in a hotel, lodge, or housing environment.

25B Environment

Work in a stand-alone retail store, or within a shopping mall environment.

Greet and service customers and coworkers.

24C Title ECS**Lodging
Manager**

Code 11-9081.00

25C Title EC**Retail
Sales
Manager**

Code 41-2031.00

26A Tasks	26B Environment	26C Title RC
Design underground or overhead wind farm collector systems. Prepare and develop wind farm site specifications.	Work with wind farm designs for alternative energy models. Create and maintain wind farm sites.	Wind Energy Engineer
		Code 17-2199.00
27A Tasks	27B Environment	27C Title IR
Conduct research to develop new and improved chemical manufacturing products and processes.	Work in laboratory setting to devise processes for manufacturing chemicals and products, such as gasoline, rubber, and plastics.	Chemical Engineer
		Code 17-2041.00

28A Tasks

Perform site specific analysis of energy efficiency and solar projects to customize to residential and commercial energy needs.

28B Environment

Design solar domestic hot water and space heating systems for use in existing and new structures.

28C Title RC

Solar Energy Systems Engineer

Code 17-2199.11

29A Tasks

Conduct chemical analyses or experiments in laboratories for quality or process control, or to develop new products or knowledge.

29B Environment

Work in a laboratory setting at a hospital, physician clinic, university, or research facility.

29C Title IRC

Chemist

Code 19-2031.00

<p>30A Tasks</p> <p>Install, maintain, and repair electrical wiring, equipment, and fixtures, using hand tools and power tools.</p>	<p>30B Environment</p> <p>Indoor and outdoor work settings.</p> <p>May install or service street lights, intercom systems, or electrical control systems for a residence or business.</p>	<p>30C Title RIC</p> <p>Electrician</p> <p>Code 47-2111.00</p>
<p>31A Tasks</p> <p>Construct, erect, install, and repair structures and fixtures of wood, plywood, and wallboard, using carpenter's hand tools and power tools.</p>	<p>31B Environment</p> <p>Work in a indoor and outdoor settings.</p> <p>Work independently, or with a crew.</p> <p>Work on projects for residence and business construction needs.</p>	<p>31C Title RCI</p> <p>Carpenter</p> <p>Code 47-2031.01</p>

32A Tasks

Coordinate activities of train crew on passenger or freight trains. Signal engineers to begin train runs, stop trains, or change speed.

33A Tasks

Use hand-welding Or flame-cutting Equipment To weld or join Metal components.

Clamp, hold, tack-weld, grind, or bolt component parts for welding.

32B Environment

Coordinate activities of switch-engine crews within yards of railroads, industrial plants, or similar locations. Coordinate crews of workers engaged in railroad traffic operations.

33B Environment

Work from indoor and outdoor settings.

Operate safety equipment and use safe working habits.

Ignite torches and start power tools.

32C Title ERC

Railroad Conductor Or Yardmaster

Code 53-4031.00

33C Title RC

Welder or Cutter or Solderer or Blazer

Code 51-4121.06

34A Tasks

Receive written prescription or refill requests.

Mix pharmaceutical Preparations.

Measure, mix, count out, label, and record medication dosages.

34B Environment

Prepare medications under the direction of a physician.

Work in a hospital, clinic, or private business setting.

34C Title CR

Pharmacy Technician

Code 29-2052.00

35A Tasks

Advise hospital administrators on the planning, acquisition, and use of medical equipment.

35B Environment

Work may involve the design and development of artificial organs, prosthesis, and health care delivery systems.

35C Title IR

Biomedical Engineer

Code 17-2031.00

<p>36A Tasks</p> <p>Study public water supply issues.</p> <p>Measure and graph lake levels, stream flows, and changes in water volumes.</p>	<p>36B Environment</p> <p>Research the distribution, circulation, and physical properties of underground and surface waters.</p> <p>Collect and analyze water samples.</p>	<p>36C Title IR</p> <p>Hydrologist</p> <p>Code 19-2043.00</p>
<p>37A Tasks</p> <p>Set-up laboratory equipment and collect samples from crops and animals.</p> <p>Plant seeds in specified areas and measure germination.</p>	<p>37B Environment</p> <p>Work outdoors on a farm, ranch, research, or food and seed production setting.</p> <p>Work with the earth and animals.</p>	<p>37C Title RIC</p> <p>Agricultural Technician or Farmer</p> <p>Code 19-4011.01</p>

38A Tasks

Install, service, and repair heating and air conditioning systems.

Reassemble and test equipment following repairs.

39A Tasks

Identify, remove, pack, transport, or dispose of hazardous materials.

38B Environment

Work indoors and outdoors.

Work with residences and commercial establishments.

39B Environment

Safely dispose of hazardous materials, including asbestos, lead-based paints, waste oil, fuel, and radioactive elements.

38C Title RCI**HVAC
Operations
Maintenance
Technician**

Code 49-9021.01

39C Title RC**Hazardous
Materials
Removal
Worker**

Code 47-4041.00

40A Tasks

Make exact measurements and determine property boundaries.

Verify the accuracy of land measurements.

41A Tasks

Lead meetings with government officials, social scientists, lawyers, developers, & the public, formulate land use and community plans.

40B Environment

**Work outdoors.
Calculate height, depth, relative positions, property lines, and terrain characteristics.**

41B Environment

Work with others to develop comprehensive plans and programs for use of land and facilities.

40C Title RCI

Land Surveyor

Code 17-1022.00

41C Title IEA

Urban Planner or Regional Planner

Code 19-3051.00

42A Tasks

Develop marketing strategies & sales initiatives for green energy products and services.

42B Environment

Promote green energy products and Services; environmental protections; & energy conservation messages.

42C Title ES

Green Marketer

Code 11-2011.00

43A Tasks

Collect, synthesize, analyze, manage, and report environmental data to improve the planet's health.

43B Environment

Collecting data to measure pollution levels, atmospheric conditions, & soil and water samples.

43C Title IRC

Environmental Scientist

Code 19-2041.00

44A Tasks

Investigate, analyze, and determine the extent of insurance company liability concerning personal or property loss.

45A Tasks

Analyze financial information and prepare financial reports to determine or maintain records of assets, liabilities, profit and loss, & tax liability.

44B Environment

Correspond with or interview medical specialists, agents, witnesses, or claimants to compile information and settle claims.

45B Environment

Work in a number Of diverse organizations, businesses, hospitals, universities, government agencies, or as a private practice accountant.

44C Title CE

Insurance Adjustor, Examiner, Or Investigator

Code 13-1031.02

45C Title CE

Accountant

Code 13-2011.01

46A Tasks

Conduct organizational studies and evaluations to assist management in operating more efficiently and effectively.

47A Tasks

Direct the availability and allocation of resources, materials, supplies, and finished products.

46B Environment

Gather, organize, and analyze data to identify problems or procedures impacting the workplace.

47B Environment

Maintain and develop business relationships with customers and vendors. Direct team activities, set schedules, and track work assignments.

46C Title IEC**Management Analyst**

Code 13-1111.00

47C Title EC**Logistician**

Code 13-1081.00

48A Tasks

Represent clients in criminal and civil litigation and legal proceedings.

Draw up legal documents and transactions.

49A Tasks

Provide high-level administrative support by conducting research, preparing statistical reports, meeting information requests.

48B Environment

Work in a private practice law firm, as part of a group of lawyers or for a government agency.

49B Environment

May require preparing correspondence, receiving visitors, arranging company travel, & scheduling meetings.

48C Title EI**Lawyer**

Code 23-1011.00

49C Title CE**Executive Administrative Assistant**

Code 43-6011.00

50A Tasks	50B Environment	50C Title RCI
Pilot and navigate the flight of an aircraft for the transport of passengers and cargo.	Flying aircraft. May involve frequent travel and overnight stays.	Airline Pilot
	Visit different cities and airports.	Code 53-2011.00
51A Tasks	51B Environment	51C Title RSE
Control and extinguish municipal fires, protect life and property, and conduct rescue efforts.	Rescue victims from burning buildings and accident Sites.	Municipal Firefighter
	Search burning buildings and administer first aid and CPR.	Code 33-2011.00

<p>52A Tasks</p> <p>Design, develop, test, and evaluate systems for managing industrial production processes and improving manufacturing methods.</p>	<p>52B Environment</p> <p>Be involved with human factors analysis, quality control, inventory control, logistics, and material flow in a variety of settings & organizations.</p>	<p>52C Title ICE</p> <p>Industrial Engineer</p> <p>Code 17-2112.00</p>
<p>53A Tasks</p> <p>Drive a Tractor-trailer rig Or truck To transport and Deliver goods, Livestock, or Materials In liquid, loose, Or packaged form.</p>	<p>53B Environment</p> <p>Work alone or with a travel partner, and drive large trucks on roadways nationwide.</p> <p>Could spend nights away from home on trips.</p>	<p>53C Title RC</p> <p>Truck Driver</p> <p>Code 53-3032.00</p>

<p>54A Tasks</p> <p>Guard, patrol, or monitor premises to prevent theft, violence, or infractions.</p> <p>Investigate disturbances and call police for help.</p>	<p>54B Environment</p> <p>Monitor and authorize entrance and departure of employees and visitors to guard against theft.</p> <p>Work solo or with partner.</p>	<p>54C Title RCE</p> <p>Security Guard</p> <p>Code 33-9032.00</p>
<p>55A Tasks</p> <p>Adjust spinal column of the body to correct abnormalities and improve function of the nervous system.</p> <p>Perform manual adjustments.</p>	<p>55B Environment</p> <p>May work in private practice or provider group.</p> <p>Counsel patients about nutrition, exercise, sleep habits, and stress.</p>	<p>55C Title SIR</p> <p>Chiropractor</p> <p>Code 29-1011.00</p>

56A Tasks

Assess and evaluate individual's problems through the use of case study, interviews, and observations; and provide individual or group counseling services to assist individuals.

57A Tasks

Assist elderly, or disabled adults with daily living activities at the person's home or in a daytime non-residential facility.

56B Environment

Work could be conducted as a private practice, or in a group practice.

Flexible work hours required for seeing clients.

57B Environment

May perform duties at a client's home, such as housekeeping, providing meals, shopping, providing transportation, and running errands.

56C Title SIA**Counseling Psychologist**

Code 19-3031.03

57C Title SRC**Personal Home Care Aide**

Code 39-9021.00

58A Tasks

Teach students in public or private schools in one or more subjects at the middle, intermediate, or secondary level (i.e., English, Math, Or Social Studies)

58B Environment

**Work alone
In classroom
With students.**

Instruct through lectures, discussions, and demonstrations.

58C Title SA

**School
Teacher**

Code 25-2022.00

59A Tasks

Plan and conduct food service or nutritional programs to assist in the promotion of health.

59B Environment

May supervise activities of a department providing food service, counsel individuals, or conduct nutritional research.

59C Title IS

**Dietician or
Nutritionist**

Code 29-1031.00

1D Tools**Hyperdermic needles****Scope sets****Ophthalmoscope****Stethoscope****Surgical clamps****2D Tools****Integrated Services
Digital Network (ISDN)
Testers****Network analyzers****Network monitoring
Software****Computer hardware
and software****3D Tools****Desktop computers****Mobile phones****Project management
Software****Accounting software****Human resources
software****4D Tools****Telephone****Mobile phones****Computer hardware
and software****Case management
reporting tools****5D Tools****Autopsy dissection
Forceps****Autopsy saws****Floor scales****Graphics and
Photo imaging
software****6D Tools****Medical charting
Systems****Microfiche or
Microfilm viewers****Postal scales****Scanner****Voice recognition
software**

7D Tools**Inverted microscopes****Cell counters****Microplate readers****Robotic liquid
Handling systems****10D Tools****Cognitive or
Dexterity or
Perceptual or
Sensory evaluation
Or testing products****Adjusting tables****Tilt tables****Pivotal traction
Therapy supplies****8D Tools****CT or CAT scanners****Radiological
Positioning aids****Medical X-Ray
Darkroom equipment****X-ray bone
Densitometers****11D Tools****Medical oxygen masks****Forceps****Ophthalmoscopes****Stethoscopes****Scheduling software****9D Tools****Computer servers****Flash drives****Notebook computers****Database management
System software****Web platform
Development software****12D Tools****Digital cameras****Global positioning
System receivers****Scanners****Photo imaging
software**

13D Tools**Animal catching
Devices****Emergency response
Litters or stretchers****Medical syringes with
Needles****Laryngoscope****16D Tools****Chef's knives****Kitchen shears****Bread slicers****Ovens and Stoves****Graters and
Shredders****14D Tools****Medical oxygen
Masks****Suction units****Stretchers****Spine boards****Anti-shock
garments****17D Tools****Biological evidence
Collection kits****Handcuffs****Handguns****Notebook computers****15D Tools****Dental
Lasers****Dental
Probes****Dental
X-ray units****Teeth cleaning
devices****18D Tools****Desktop
Computer****Notebook
Computer****Personal Digital
Assistant (PDA)****Financial Analysis
Software**

19D Tools

Desktop computer
 Notebook computer
 Hard disk drives
 Tape libraries
 Backup software

22D Tools

Compass
 Drafting kits
 Notebook computer
 Computer-Aided
 Design software

20D Tools

Oscilloscopes
 Electronic voltmeters
 Artificial intelligence
 Systems
 Hand tools
 Power tools

23D Tools

Electronic blood
 Pressure units
 Forceps and
 Hemostats
 Medical oxygen
 Masks
 Intravenous catheters
 Medical software

21D Tools

Hammers
 Organic light
 Emitting displays
 Pullers
 Nail sets
 Specialty wrenches
 Auto scanners

24D Tools

Desktop computers
 Personal Digital
 Assistant (PDA)
 Organizer
 Credit card
 Machines
 Multi-line
 Telephone system

25D Tools**Bar code reader /
Scanner****Magnetic card
Reader****Credit card
Processing terminal****Security monitors****Cash register****28D Tools****Notebook computer****Computer-aided
Design software****Solar photovoltaic
Generator systems****26D Tools****Notebook computer****Electronics****Electrohydraulic
Systems for
Wind turbines****29D Tools****Benchtop centrifuge****Hematology or
Chemistry mixers****Lasers****Spectrometer****X-ray diffraction
equipment****27D Tools****Freeze dryers****Heat exchangers****Laboratory mixers****Micro controllers****30D Tools****Cable reels****Screwdrivers****Stripping tools****Voltage or
Current meters****Wire cutters or
Cable cutters**

31D Tools**Ladders****Levels****Power sanders****Power saws****Squares****34D Tools****Laboratory
Balances****Blenders****Mills****Automatic unit
Dose-strip
Packaging machines****32D Tools****Dock plates****Rail switching
Systems****Specialty
Wrenches****Telecommunications
Equipment****35D Tools****Electrometers****Medical Magnetic
Resonance Imaging
Equipment****Ph electrodes****Physiological
recorders****33D Tools****Blow torches****Gas Welder****Welding mask****Workshop presses****Welding guns****36D Tools****Logging instruments
For water wells****Open stream
Current meters****Pressure
Sensors****Water analyzers
Water samplers**

37D Tools**Animal chutes****Cultivators****Haymaking
Machinery****Planters
And seeds****Sprayers****40D Tools****Instrument
Tripods****Lasers****Levels****Measuring rods****Computer-aided
Design software****38D Tools****Flow sensors****Hammers****Pressure
Indicators****Thermocouples****Voltage or
Current meters****41D Tools****Global positioning
System receivers****Laser printers****Notebook
Computers****Computer-Aided
Design software****39D Tools****Air sampler
Or collector****Hazardous material
Protective apparel****Pneumatic sanding
Machines****Radiation
Detectors****Water Samplers****42D Tools****Notebook
Computer****Powerpoint
Software****Scanner****Laser printer**

43D Tools**Air samplers****Radiation
Detectors****Soil core
Sampling apparatus****Water analyzer****Water samplers****46D Tools****Desktop computers****USB flash drives****LCD video projectors****Laptop computers****Access / SAS
Software****Calculator****44D Tools****Desktop
Computers****Measure makers****Personal digital
Assistant (PDA)
Organizer****Computer-aided
Design software****47D Tools****Desktop
Computers****USB flash drives****LCD video projector****Inventory
Management
Software****Project management
software****45D Tools****Desktop
Computers****PDA organizers****Scanners****Accounting
Software****Tax preparation
software****48D Tools****Desktop
Computers****USB flash drives****PDA organizer****Scanners****Presentation
Software**

49D Tools**Notebook
Computer****Scheduling
Software****Microsoft Office
Software****Human Resource
Management
software****52D Tools****Hydraulic motors****Integrated motion
Control supplies****Microcontrollers****Sound measuring
Apparatus****Decibel meters****Turntables****50D Tools****Aircraft
Communications
Systems****Aircraft
Guidance
Systems****Aircraft
Oxygen equipment****Flight control
systems****53D Tools****Flatbed trailers****Hoists****Satellite linkup
Systems****Snowplow
Attachments****Trailer Hitches****Wheel loaders****51D Tools****Blocks or
Pulleys****Fire or rescue
Trucks****Fire suppression
Hoses****Pick ax and Pry bar****Power saws****54D Tools****Automobile****First Aid Kits****Handcuffs****Handgun****Two-Way
Radio****Notebook
computer**

55D Tools**Dynamometers****Physiological
Recorders****Adjustable
Tables****Back traction
Support systems****EMG units****58D Tools****Desktop
Computers****LCD projectors****Chalkboard & chalk****PDA organizer****Presentation
software****Calculators****56D Tools****Desktop computers****Biofeedback
Equipment****USB flash drives****Accounting and
Scheduling
Software****Telephone****59D Tools****Bodyweight
Measuring scales****Calorie meters****Glucose monitors****Skinfold
Calipers****Medical software****57D Tools****Adjustable
Wrenches****Hammers****Screwdrivers****Bath chairs****Telecommunications
devices****60D Tools****Adaptive
Communications
Software****Sound measuring
Apparatus****Stroboscopes****Voice synthesizers****Tablet computers**

VITA

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