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Gender Differences in Career and Educational Decisions

Anita Melton

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Anita Melton , B.A.

An Abstract Presented to the Faculty of the Graduate
School of Lindenwood College in Partial
Fulfillment of the Requirements for the
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ABSTRACT

Differences in male and female self-reported interest and ability in occupations were examined. The researcher studied participants' interest and ability scores on 7 occupational categories of the Campbell Interest and Skill Survey : influencing, analyzing, producing, adventuring, organizing, helping, and creating. Thirty-nine subjects, age 17 to 23, completed the 320 item survey. The sample included 26 female and 13 male subjects. The survey utilized a 6 point response format requiring the subject to determine to what degree they share the interest or ability mentioned. To determine gender differences in response scores, descriptive statistics and one way analysis of variance (ANOVA) were performed. Gender-based response differences were found in interest and abilities within producing, adventuring, and organizing occupations. Differences were also found in the interest responses involving influencing and helping careers.

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TABLE OF CONTENTS

LIST OF TABLES

CHAPTER 1

Introduction

Throughout history, women have been treated and accepted as socially, intellectually, and economically inferior to men. This has long been a basis of society for men and women of most countries . Women have been overlooked in receiving credit for many of their accomplishments, cheating their descendants of this valuable legacy.

David and Myra Sadker (1994) write about the history of Catherine Littlefield Greene and the invention of the cotton gin. Eli Whitney devised his design for a model of this machine while working on her estate. But, his design was flawed. When the seeds were pulled from the cotton, they became clogged in the rollers. Catherine Greene came up with the idea of using brushes for the seeds, perfecting this critical invention. The concept of the gin was so simple that machines sprung up on various plantations. To finance the lawsuits during the fierce battle over patent rights, Catherine Greene sold her estate. Seven years later, Eli Whitney was awarded full title to the cotton gin. In spite of her valuable contributions to this famous invention, mentioned in almost every American history book published, few have ever heard of Catherine Greene.

A peculiar aspect of the history of negative attitudes towards women is how

these attitudes crossed racial lines as well. Black women have a rich history of having their achievements overlooked. Around the turn of the century, Sarah Walker metamorphosed herself from a laundress to the first American self-made female millionaire through selling her hair straightening products (Brown, 1996). One would expect to find mention of such a remarkable accomplishment in history books, alongside John Paul Getty and Rockefeller, but no such reference can be found.

In the past decades, women have been subject to being passed over for better, and/or limited to lesser, educational and career opportunities. The effects of gender socialization in education do not just fade away and can be far reaching. Myra and David Sadker (1994) relate the story of a woman who was passed over on a graduate scholarship thirty years ago:

> "He told us there was one scholarship to graduate school available. Although, I had a slightly higher grade point average, he decided to award the money to John who, he said, would have to support a family some day. What really gets me today, almost thirty years later, is that back then it all made perfectly good sense. Even though John came from a rich background and I came from a poor one, I agreed that the scholarship should go to John. Today I am the sole support of my two children, and I wish I had that graduate degree" (p.35).

Several generations of women, and consequently their children, have suffered the effects of under-education and underemployment resulting from gender bias.

The history of gender bias in education began with females fighting for admission to male universities in the 1870's. This fight was still thriving in the 1960's and 1970's until the Ivy League schools capitulated, joining other universities who already accepted women applicants. Sadker and Sadker (1994) cite figures showing that females comprise 53% of this nation's post-secondary students. This would seem to show that the barriers once separating the sexes no longer exist, but appearances deceive. "The brick walls have been replaced with those of glass.....the campus remains a divided one; it channels women and men into different educations that lead to separate and unequal futures," (p.165).

The concept being referred to is the glass wall. Glass ceiling is a related concept referring to women attaining less success in their careers for work equal to their male counterparts. These names have been used to describe these phenomenon because gender bias is often unspoken but real, like glass, that can be seen through. Gender bias maintains a critical variable in the social structure that effects the career and educational options available to both men and women.

Women have made progress in their participation and achievement in majors and occupations historically viewed as male-oriented including: physics, chemistry, computer science, architecture, mathematics, medicine, and engineering, although, overwhelmingly, involvement and success in these arenas still belongs to men. According to Sadker and Sadker (1994):

"The 'hard' sciences are still housed on the male side of the glass wall. Almost

70% of today's students who major in physics, chemistry, and computer science are male. Engineering tops all of these, however, with 85% of bachelor's degrees going to men. The overwhelming male majority extends beyond the hard sciences and engineering to theology (75% male), philosophy (64%), agriculture (69%), and architecture (61%)," (Sadker & Sadker, 1994, p.165). The researchers found that women receive 90% of bachelor's degrees in home economics, 84% in health sciences, 75% of bachelor's degrees in education and foreign language, and 66% of the degrees in psychology, communications, and the performing arts. Women also earn half as many doctorates as do men. Men earn 75% of doctoral degrees in business and 91% of degrees in engineering. Women outearn men, in terms of doctoral degrees, only in the field of education (1994). This disparity also appears to extend to gender bias in faculty degrees. Nationally, 68% of male faculty have tenure, versus only 45% of female faculty.

Other educational gender bias issues have recently come to light. Many researchers have demonstrated that standardized tests, including the Scholastic Aptitude Test (SAT) and the American College Testing (ACT) program, are biased against the economically disadvantaged, minorities, and women. These groups consistently do worse than males who participate in testing (Berger, Colton, Mistry, & Rossi, 1993). According to Pool (1994), male high school seniors score, on the average, 45 to 50 points more on the SAT than females on the math part alone. This proves to be a great advantage since this equals

approximately 8% of the possible points on this instrument.

One would expect these biases to lessen over time. To some extent, this has happened. But, recently, popular literature including Men are from Mars, and Women are from Venus (Grey, 1992) glorify the still common belief in women and men being unchangeably different and encourage differential treatment. Although this type of thinking is currently popular, it is important to consider why gender differences vary dependent on the time and culture being considered. Eisler (1995) cited an example related to this issue by describing Victorian England where the true mark of femininity was appearing pale and weak versus in Kenya where femininity has traditionally been proven by a woman's ability to do hard physical labor on behalf of her family.

Other differences noted by researchers include the definition held by working class people for masculinity, typically differing from that held by middle-class people, rich people, and poor people (Connell, 1996). For the purposes of this research, masculinity and femininity will be defined in terms of the popular, currently held Western values of women being expected to concede their own desires to the stronger, smarter, and generally more important men.

Other differences, including how males and females experience their education, become apparent early on in a student's life. According to Seymour (1995), who studied women in the sciences, girls and boys are mostly equivalent in mathematical and scientific achievement until they reach the ninth grade, where

they begin to increasingly differ in the number of math and science courses taken. By college, there exist low women to men ratios in these majors: five men to every woman in engineering and two or three men to every female physical science major.

Sadker and Sadker (1994) extensively researched the changes boys and girls go through during their education, to determine when and why they exist. They report that girls are equal or ahead of boys on all achievement and psychological measures used during the early grades. By high school, they have fallen behind the boys. Girls score consistently lower on SAT and ACT tests, mainly in the areas of science and math, costing them most of the state and national scholarships. Women also score lower than men on all of the sections of the Graduate Record Exam (GRE) .

In college, gender division has particularly powerful effects. The Sadkers (1994) found that the most female populated doctoral programs are in education. Education is where women earn 58% of the doctoral degrees, though they represent only 45% of the faculty. Due to this, female students lack mentors and role models causing women to be less likely to pursue graduate work. This process becomes an ongoing cycle while male professors prepare male students to become the faculty of the future, helping to keep campuses divided and unequal.

The culmination of the effects of gender bias in education against females has resulted in increasing interest in women's colleges. Factors that have led to the

renewed popularity of women's colleges ranges from the "Hillary Factor", Hillary Rodham Clinton attended Wellesley, to the belief that these facilities better educate and prepare women for their careers. "Women's colleges that once downplayed their women-only status recently have begun to market their special status more aggressively....citing statistics that show 25% of the women in Congress graduated from women's colleges," (Livingston, 1994, p.3). Other selling points of women's colleges include the equality women receive in the classroom and the increased availability of mentors and role-models. According to Livingston (1994), applications at the 84 women's colleges in the United States rose by 8% in 1993 and 6% in 1994. Still, after completing college, these women join the workforce and face the gender-bias waiting for them in that arena.

At this point it is important to define, for the purposes of this research, the concept of the "glass ceiling". Most people are familiar with this term as it was defined by Tannen (1994) : "the glass ceiling [is] an invisible barrier that seems to keep women from rising to the top," (p.133). The main difficulty in this definition is that it explains the phenomenon but not why or how it happens. The definition also fails to address what needs to occur for this to end. The phenomenon is considered so serious that the Glass Ceiling Commission was created from the Civil Rights Act of 1991, to investigate this problem.

The glass ceiling may be a matter of changes requiring time, more than an intentional barrier used to subvert women and their careers. The Glass Ceiling

Commission concluded there will be a delayed effect as women gain the education and experience necessary to legitimately break through the glass ceiling:

> "In 1970, when today's 50-ish managers were just getting started, men accounted for 96% of the MBA's in this country. So is it really a scandal that they tend to dominate the boardroom of 1996? Today, women earn 36% of the MBA's - a change that will inexorably lead more and more women to the top of major companies," (Erkut, Fields, & Hamlin, 1996, p.2) .

When polled by the Glass Ceiling Commission, only about 14% of female managers versus 45% of male managers state they want to be the CEO. Women's aspirations and preferences apparently play a vital role in the glass ceiling phenomenon. Women appear less inclined than men to put their career ahead of all other concerns. These alternate priorities stunt the professional success of women.

In 1993, Beron, England, and Kilbourne presented findings from their research on earnings, race, and gender to colleagues at the annual Southern Sociological Association meetings. The findings were published the following year. They reviewed information from the National Longitudinal Survey (NLS) looking for the effects of experience, education, marital status, occupational characteristics, and the industrial sector of various occupations, on earnings. These variables were assessed to find how they interact with gender and race to effect pay. The researchers found that women are concentrated mainly in female occupations and these, "pay less than predominantly male occupations, even when occupations

demand for skills and working conditions are controlled," (p.1151) . Women are concentrated in nurturant occupations including: nursing, childcare, counseling, social work, and teaching. Women represent more than 85% of the workers in these fields. Nurturance is a devalued skill in the workplace. Women being concentrated in this sector contributes to the gender wage gap.

Another important finding that surfaced from this study showed the gender gap in pay is partly caused by women having fewer years of employment experience, which may be due to breaks for child rearing. Also, women earn less in return to their investment of education and experience than do male counterparts, in the same profession.

Other researchers profess that inequities in the workplace are simply a reflection and outgrowth of the inequality and gender stratification maintained in the home. It is within the family that many aspects of gender inequality are produced and reproduced. Economic and interpersonal dependence of women on men, and in some cases more brutal forms of subordination, are typical components of marriage and family.

"Women's prescribed roles leave them with the burden of extensive domestic and nurturance responsibilities, as well as having limited power within the family. These patterns create gender inequity within the home and are reflected in the ideology legitimizing a gender-segregated workforce in which women's earnings and opportunities are not equal to men's," (Kane & Sanchez, 1994, p.1081) .

Statement of Purpose

The purpose of this research is to determine if there is a significant difference in career and educational choices made by students, based on their gender. The research reviewed suggests that women concentrate themselves in stereotypical female occupations as a result of gender socialization. The "female" occupational subsets on the CISS include: Organizing, Helping, and Creating occupations. Men are concentrated in the "male" occupational orientations including: Influencing, Analyzing, Producing, and Adventuring occupations.

Null Hypotheses

This study examines the following null hypotheses:

1. There is no difference in the number of men and women interested in influencing careers.

2. There is no difference in the number of men and women interested in analyzing careers.

3. There is no difference in the number of men and women interested in producing careers.

4. There is no difference in the number of men and women interested in adventuring careers.

5. There is no difference in the number of men and women interested in organizing careers.

6. There is no difference in the number of men and women interested in helping careers.

7. There is no difference in the number of men and women interested in creating careers.

8. There is no relationship between gender and level of confidence in ability to perform influencing career tasks.

9. There is no relationship between gender and level of confidence in ability to perform analyzing career tasks.

10. There is no relationship between gender and level of confidence in ability to perform producing career tasks.

11. There is no relationship between gender and level of confidence in ability to perform adventuring career tasks.

12. There is no relationship between gender and level of confidence in ability to perform organizing career tasks.

13. There is no relationship between gender and level of confidence in ability to perform helping career tasks.

14. There is no relationship between gender and level of confidence in ability to perform creating career tasks.

CHAPTER 2

Literature Review

Gender Bias

Researchers have recorded the influence of gender bias by observing parents with their children from birth. Sadker and Sadker (1994) report observing women playing with a baby they just met. In one instance, the woman was told the baby is a boy, so she gave him a hammer to play with and when he became restless, she engaged him in even more play. The next woman was told the baby was a girl, so she selected a doll for her to play with. When she was restless, the woman cuddled with and attempted to soothe her. Experiments such as these demonstrate that gender socialization begins at birth.

Rosenthal and Jacobson (1994) conducted a similar study on school-age children focusing on teachers' attitudes and influence on children. They assessed a class, through IQ testing, for students most likely to make large academic gains during the year. Eight months later, the chosen students were administered an IQ test where they did indeed score much higher than they previously had. Actually, the students named were picked at random and it was the teacher's expectation that they would excel and the extra attention and encouragement they were given, that created this effect.

Studies such as these illustrate how critical parents and teacher expectations and interactions with children affect their development. This can be seen in boys

being encouraged to be active and aggressive, whereas girls are encouraged to be passive and cooperative.

Social and gender lessons are taught to children, by peers and teachers, throughout their education. Sadker and Sadker (1994) label these as "hidden lessons", referring to the unfortunate yet common experiences of girls receiving less attention from teachers, gender stereotyping in course enrollment, sexual harassment, and biases against females in standardized tests. These authors purpose that females often receive fewer opportunities and a lesser educational experience than do their male peers.

Seymour (1995) researched the continuing loss of women in science, mathematics, and engineering majors. In her review, she describes boys receiving an experiential, involved educational experience built with critical feedback, praise, and support for assertiveness. Girls receive a more passive, less experiential educational opportunity, even in all girls schools.

Other researchers including the Sadkers, agree with Seymour. It is this active learning and feedback that serves as a great educational advantage for boys. People learn better when they are treated as an active participant in the process versus acting as a spectator, on the sidelines.

Seymour (1995) mentions a tendency for girls to explain success in mathematics to effort and conversely, failure due to lack of ability. Boys attribute their success to ability and failure due to a lack of effort. This is obviously a

confidence issue but it illustrates just how complex gender socialization issues are and that there is no individual factor causing this. These attitudes also demonstrate how different the male and female educational experiences truly are. Seymour also found intense gender bias issues at the college level, more so among peers than involving professors. One issue that surfaced during her study was the assumption among students, especially engineering majors, that women graduates would receive preferential hiring in this rather competitive field. This, coupled with preferential scholarships aimed at increasing women's participation in the sciences, fuels animosity between the male and female students. This also adds incentive for male students to support unfair attitudes and practices against female students in their major.

Another issue that appears to have contributed greatly to women leaving science and mathematics majors is the "weed out" system. Discussed frequently throughout Seymour's (1995) study, "weeding out" is the deliberate denial of nurturing and encouragement on the part of the professors in the science and mathematics departments. This is done to force the students to bond and work within their peer group. But, this also works to drive many female students out of these majors. Females normally experience more personal bonds with their teachers throughout their early education than do boys. Therefore, when females encounter this indifferent, impersonal treatment as college freshmen, they have a more difficult time coping than males.

Males experience an impressive amount of pressure to conform to what is considered gender-appropriate through their peers in school. Sadker and Sadker (1994) interviewed a student who listed the following as the understood code of behavior for boys: they must play three varsity sports, be a good student, party and drink, and brag about sexual accomplishments, real or imagined. They also maintain that boys are three times more likely than girls to become an alcoholic and 50% more likely to abuse drugs. Teenage boys are more likely to die from gunshot wounds than all the natural causes of death. Males also commit suicide twice as often as females. These facts highlight the mutuality of the effects of gender socialization on males, as well as females.

Another exclusively male pressure is found in studies that show adults are concerned about cross-sex behavior in both girls and boys. But, parents tend to believe that girls will outgrow these behaviors ; whereas, they are afraid that boys will carry it into adulthood (Sadker & Sadker, 1994). An example of this would be a parent who is scared their son will grow up to be a homosexual if he is allowed to play with dolls.

The most negative use of gender socialization with children can be seen when parents and educators use gender as a way to control children through the use of shame. This is often seen being used with children from infancy through secondary school. An example of this is when boys are told not to cry by telling them they are "acting like a girl". Another example is when girls are told not to climb trees or

"act like tomboys" because the "boys will not like them".

Beron, England, and Kilbourne (1994) found, through their research, that the penalty for working in a chiefly female profession is largest for black females. This compensation penalty for working in female professions is more than twice the penalty for white women, and eight times the penalty suffered by men of any race. This has inspired many women, irrelevant of race, to pursue positions in typically male occupations. In this study, they found that the gender gap in pay is much higher among black men and women than that of white men and women.

Education Issues

Gender socialization effects are documented in our educational system and in what parents teach their children through their interactions at home. These are mentioned simultaneously since they are often `interrelated topics. Rubinowski (1991) wrote about an experiment by Dr. Gershenfeld at Temple University focusing on how parents and educators unknowingly shift children's perceptions of intelligence. Parents and their children were asked who is smarter, girls or boys ? They consistently answered that girls are smarter than boys. But, when they were later asked who is smarter, men or women; they consistently answered that men are smarter. This finding makes it apparent that people generally believe that boys grow up to become competent, intelligent men whereas they believe the reverse to be true of girls, as they grow up to become women. The question is : how are

children learning this ?

Children's most constant exposure to knowledge and "facts" in school is through textbook learning. This continues as a critical component of learning through, and including, college. Lawton (1994) found a disturbing lack of women mentioned while examining textbooks. In a 600 page book of world history, only seven pages were found containing any mention of women.

According to Sadker and Sadker (1994) , "Each time a girl opens a book and reads a womanless history, she learns she is worth less," (p.13) . The researchers believe girls are made into educational "spectators" rather than participants. In the 1970's, the Sadker's reviewed history books and found the typical history book to contain only two sentences about women. More space is used to discuss the six-shooter than the entire women's sufferage movement. In 1989, they reviewed math, language, and history texts finding that mentions of boys outnumbered girls by 3 to 1.

Children can only learn what they have been taught. In 1992, the Sadker's asked fourth, fifth, and sixth graders to name 10 men and women from history. These people could be from anywhere in the world but they could not be entertainers or athletes. On the average, the children were able to name 11 men but only 3 women (Lawton, 1994) . Children are being taught that women have been invisible throughout all of history.

Inequities can also be found in college texts. Sadker and Sadker (1994)

researched medical school texts finding that males were shown in an average of 64% of illustrations and females in only 11%, with the other 25% remaining gender neutral. In reproduction topics, the illustrations were almost equal, in gender representation, but the narratives emphasized more concern and respect for the patient's husband than the patient herself.

Important experimentation and research has been focused in the area of teacher and student attention and responses in classrooms. Lawton (1994) contends that elementary school is where educational gender bias begins. Girls are short-changed on the playground and throughout classroom discussions. In most schoolyards, the boys play area averages 10 times larger than that for girls.

Houppert (1992) mentions a study that shows boys calling out answers in classrooms eight times more often than girls. When students called out without permission, the teachers usually listened quietly to the boys but reprimanded girls for the same behavior. This is an example of how teachers encourage assertiveness in boys and passivity in girls. In this, one can see the foundation being laid for the "double standard" girls will be living under all their lives. By the end of elementary schooling, girls receive better grades, fewer punishments, but also much less attention (Lawton, 1994) .

Lawton (1994) also refers to a study performed by Jacqueline Eccles, a psychology professor at the University of Michigan. She observed junior and senior high math and science classes concluding that teachers pay more attention

to high-achieving students, regardless of gender. This is contrary to most other researcher's findings. But, she also found that in one-third of classes, the teacher practiced overt sexist behavior by treating boys better than girls displaying comparable abilities. This would indicate that teachers displaying gender preferential treatment of students do exist, but they are the exception rather than the rule. This also demonstrates gender biased behaviors are not unaviodable.

Contrasting Eccles' study, the Sadker's (1994) state, " Unlike the smart boy who flourishes in the classroom, the smart girl is the student who is least likely to be recognized," (p.50). They point out that relative attention in school mirrors the experience of pay in later careers. White males are most likely to receive instructor attention, minority males are second, white females are third, and the minority females are least likely to receive this attention. This structure repeats itself in the career world, demonstrating the far reaching effects from this type of learning in education.

Sadker and Sadker (1994) studied 100 classrooms finding the amount, and quality, of descriptive feedback to be the largest gender based difference. Boys receive more correction, praise, and criticism. The Sadkers argue these responses are important because they foster achievement and learning. Girls receive superficial "okay" type feedback which communicates disinterest to their responses and ideas. This may play a part in the low self-esteem girls begin to develop at this stage.

These difficulties follow female students into their college years, particularly those who choose typically male courses of study including: science, math, and engineering. Women face two disadvantages before they ever sign up for their first college course. First, according to the American Institute of Physics (AIP), while in high school 26% of boys take physics while only 14% of girls study it. Statistics in math, science, and computer courses are less extreme, but show a similar pattern. Secondly, girls leaving high school face the social barrier of these majors being considered masculine in nature (Ruskai, 1990) .

According to Seymour (1995), in spite of these barriers and women's generally low level of confidence in their abilities, the number of women and men beginning mathematics are equal and a slightly higher number of women enter degree programs in the life sciences. But, their persistence rates in science, mathematics, and engineering programs are significantly less than that of their male peers. This has raised many questions since the grade point averages of women entering these fields, on the average, are higher than that of men, even among those who later switched out of these majors.

The consensus among researchers is that women switch from these majors because scientific disciplines focus on individual competition and independence rather than interactive learning. Women in both undergraduate and graduate programs report feelings of alienation and depression causing them to leave these majors. In the same programs, males report increases in self-esteem and their

career aspirations (Seymour, 1995). This basic difference in how men and women respond to the environment found in science and math disciplines plays a significant role in women being under-represented in these majors.

A final reason that Seymour (1995) credits for the loss of women in the science and mathematics disciplines is the motivation behind female versus male entrance in these fields. She found many of the women who choose these fields do so due to prompting by their parents, teachers, or mentors, instead of a genuine personal interest in the major or a particular career. As with any choice made strictly to please others, it cannot be sustained through the rigors that must be faced to succeed with it. This is mainly a problem with female students since girls are raised and encouraged to seek other's approval above intrinsic goals and satisfaction. Due to this external locus of control, these students are more prone to become discouraged by the self-reliant focus of these majors. "Young women who are looking for 'en'-couragement to bolster their self-confidence, but who cannot evoke it from faculty tend to feel 'dis'-couraged, even though faculty may have said nothing negative to them," (Seymour, 1995, p.467) .

Effects of self-doubt on talented, intelligent college students is overlooked by most research studies. Arnold tracked high school valedictorians and salutatorians from schools in Illinois through the last decade. When they graduated high school, males and females reported equal estimations of their own intelligence. By their sophomore year of college, the men maintained the same confidence in their

intelligence, but the women's opinions of their intellect had dropped. By their senior year, not one female valedictorian rated their intelligence as "far above average" but most were planning to go to graduate school. Yet, 23% of the males still labeled themselves as such. It is important to note that the women in this study earned slightly higher grades than the men involved (Sadker & Sadker, 1994). These findings indicate that the college experience undermines the self-confidence of most female students, regardless of major.

Self-confidence problems are less prevalent among women in single-sex colleges. They exhibit positive self-esteem, coupled with higher educational and career success, than females at coeducational colleges, on the average. According to the Sadkers (1994), graduates from women's colleges earn more degrees from nontraditional majors and are three times more likely to go to medical school than their coeducational peers. Their graduates are also well represented in high-level political careers.

The final population that needs to be mentioned are those students who fail to complete high school. The problems drop-outs face run much deeper than a mere lack of confidence. Almost 40% of female single parents have an eighth grade education or less, and 98% of Aid For Dependent Children (AFDC) recipients are women. This situation is not improving. The average reading ability of people, ages 17 through 21, receiving AFDC, is below the sixth grade level (Jones, 1992). Sadker and Sadker (1994) reported that more boys than girls drop out. However,

by age 25, more males than females have returned and successfully earned a diploma. Since girls seldom return to school after dropping out, this is a more serious problem for females than for males.

The Sadkers (1994) also found that girls drop out from school for different reasons than boys. Girls leave due to academic failure, the need to care for siblings at home, the need to earn money, but most often, due to giving birth. Since they rarely return, dropping out has long-term effects. In 1990, the average earnings of a 20 through 24 year old high school drop out was $8350/year for men and $3100/year for women. Most of these women support children, as well as themselves.

Related to the incidence of academic failure is the overwhelming number of females who are functionally illiterate. It has been estimated that one in five American women is functionally illiterate, without possessing basic reading, writing, and computational skills (Jones, 1992). The significance of this revelation becomes apparent when one considers the majority of single-parent homes are headed and supported solely by women.

A final issue in the research on gender-bias in education is the theoretical link between higher levels of education and increasingly androgynous behavior. Testing has been done comparing scores, from males and females, on the masculinity/ femininity scales of the Minnesota Multi-phasic Personality Inventory (MMPI) between groups with lesser and greater levels of education. At higher education

levels, the differences in male and female scores tend to become less distinct, and men/women give more answers atypical of the opposite sex (Anastasi, 1988). This indicates that socially created sex roles may have a negative correlation with the mental abilities of men and women alike. This serves to stress the importance of our educational system and parenting styles moving away from negative socialization techniques.

Testing Bias

A separate, recurring topic within research on gender issues involves testing bias in standardized tests. Standardized tests are used as a screening tool in educational planning issues from scholarship qualification to initial college entrance. Based on research by David and Myra Sadker (1994) :

> " Girls begin school looking like the favored sex. They outperform boys on almost every measure. Most people are aware of their verbal advantage and their reading and writing skills. Fewer realize that in these early years girls also surpass boys on math and social studies tests; in fact, they surpass boys on every standardized test in every academic area except science, where boys hold a slight advantage (p.138) " .

This continues until middle school when girls' test scores begin dropping and the boys' scores surpass theirs. Research shows that girls' test scores continue to drop throughout their education. The side effects from this include, but are not limited

to : loss of self-esteem, exclusion from some colleges, and loss of scholarships.

Lawton (1994) and the Sadkers (1994) compiled research illustrating that the SAT is biased against females. Lawton found boys scoring an average of 50 to 60 points higher than girls. She believes there is concrete evidence this phenomenon is the result of gender bias. Lawton discovered high school girls with an A+ grade point average typically score 83 points less than their male counterparts with similar grades. The Sadkers made similar findings.

Other compelling evidence of gender bias can be found in how the Educational Testing Service (ETS) chooses to score their PSAT. They count the verbal score twice and the math score only once, in an attempt to neutralize any unfair advantage males have. Still, only 8,000 girls versus 18,000 boys reach the highest PSAT categories. The Sadkers (1994) contend that females would have to be spotted an extra 60 points on the SAT just to make it an even proposition with males. These are important findings since these scores are used to determine entrance into college and scholarship eligibility.

In excess of a million students per year participate in the American College Testing (ACT) program. This test is similar in nature to the SAT but geared towards assessing academic achievement rather than measure aptitude. Girls perform better on the ACT than the SAT, but boys still outperform them on this test as well. A similar effect is seen on the Graduate Record Exam (GRE) where men hold a 127 point lead on women. This is larger than the lead they hold on the

SAT, so this gap does not decrease with age or increased levels of education (Lawton, 1994) .

This bias on standardized tests has created such discrepancies with scholarship distribution that, in 1989, FairTest won a landmark lawsuit decision against the state of New York. At issue, was the practice of awarding scholarships based solely on SAT scores. Scholarships thereafter, in New York, were based on grades, as well, until the scholarships were completely eliminated.

With these biases being so widely acknowledged, books and classes emerged to tutor people, enabling them to improve their scores on these tests. In 1993, Berger, Colton, Mistry, and Rossi wrote Up Your Score providing testing information and tips on the SAT. They contend that the average score for males on the SAT is 927, and only 875 for females. This is a 52 point difference, consistent with the spread reported by the other researchers presented in this review. They also confirmed that scores are even lower for minorities and that overall scores can be correlated directly with family income level. Students of families with over $70,000/year in income averaged a score of 1000, versus students of families with incomes of under $10,000/year who averaged scores of 767. Therefore, biases may also be related to socioeconomic status.

Camilla Benbow performed a study with Julian Stanley at John Hopkins University where for eight years Stanley gathered information on "super-smart" seventh and eighth graders, who scored in the top 5% of their class on

standardized math tests. Five-thousand, seven-hundred boys and 4,300 girls in this group took the SAT. Benbow analyzed the scores and found that the boys and girls scored similarly on the verbal part but the boys averaged 30 to 35 more points on the mathematical section. Among the students who scored over 700 on this section, boys outnumbered the girls 13 to 1 (Pool, 1994) . This group was screened to contro! for variances in GPA or ability, through other standardized testing. The only explanation for this gap is gender bias in the instrument used. In this case, it was the SAT.

Researchers have also found testing bias in career inventories. Farmer (1995) researched the Self Directed Search (SDS) which produces significantly higher scores for females on social scales and higher scores for males on realistic scales. Results such as these demonstrate that in spite of guidelines created by the National Institute of Education in the 1970's to prevent gender bias in these instruments, it still exists. The SDS manual states that this instrument is not recommended for use with college-bound people. Yet, it is unclear how an instrument that has been found to be gender biased would be appropriate for any population.

Career and Education Choices

The complicated process of career choice begins early, with the educational choices girls and boys, then young men and women, make. White (1991) surveyed

3,000 American children finding that teachers and parents exert more influence than peers in convincing girls they cannot succeed in science and mathematics. Then, girls decreased interest in math correlates with a decline in self-esteem from elementary to high school.

Rubinowski (1991) also documents this loss of self-esteem in her research. She states that, by high school, only 29% of teenage girls report liking themselves. A study released in 1991 by the American Association of University Women (AAUW) documents that at age 8 or 9, girls are confident in themselves and their abilities, with 45% reporting they are good at a lot of things. By age 15, most of this confidence has disappeared, with only 23% still believing they "are good at a lot of things". This loss of self-esteem comes at a critical point in their lives when important career choices are being made. It appears that many women make these decisions from a point of insecurity and low self-esteem that is often reinforced through the opinions of their parents and teachers.

The AAUW study discovered one anomaly that may help explain why self-esteem tends to slide in females. They found that black girls do not lose self-esteem as they grow older. Researchers believe that black girls continue to receive support from the community and family but, instead, develop negative feelings towards their school and teachers (Rubinowski, 1991) . Where it is hopeful to see some girls receiving the family support they deserve, these negative attitudes towards school still put them at risk for dropping-out and failing to complete their

education. This will ultimately effect their career choices.

Another barrier to higher education is simply the cost. One would expect this to be an equal deterrent for males and females, but often it is not. Sadker and Sadker (1994) report that four out of five students end up in debt as they prepare to become doctors. Approximately 58% of boys go into debt while almost 80% of girls find themselves in this situation. Medical degrees require extensive schooling, more than any other career, so this is an extreme example. Yet, the discrepancy in amounts borrowed by different genders to complete schooling must still be acknowledged as a significant barrier.

Difficulties are also manifested through the low number of women graduating with math, science, and engineering degrees. According to Dresselhaus (1996), the number of women earning these degrees has increased but not as much as expected. In 1950, 23% of math degrees were earned by women. By 1988, 35% of math degrees were being earned by women. Similarly, women earned 10% of physical science degrees and none of the engineering degrees in 1950. By 1988, women were earning 25% of physical science degrees and 11% of engineering degrees. Johnson (1992) reported similar figures from the National Science Foundation. This shows the picture for women in science is improving but a lot of progress remains to be made.

A common theme within the body of gender focused research is the hostile, competitive environment encountered by female students in the science majors.

Johnson (1992) referred to a report issued by the American Association for the Advancement of Science (AAAS) stating that, "faculty and students in science classes treat women differently from and more negatively than the way they treat men," (p.3). Another element of this hostile environment is the negative attitude the male students hold toward the female science and mathematics majors. This was repeatedly reported as a daily source of stress for women in these majors (Seymour, 1995). This attitude is seen mostly among science majors.

A final stress mentioned by women attempting math, science, or engineering majors involves their pursuit of respect and acceptance from male peers. Many of these women put themselves in the double-bind situation of attempting to gain acceptance in academic terms by surrendering acceptance on personal fronts. This is usually accomplished by making their personal appearance as plain as possible or by dressing similar to the men to avoid being noticed (Seymour, 1995).

By the time a student makes choices about their education, they have thought a lot about what is and is not possible with their career. Most researchers concur that men care more about attaining advancement and authority in their chosen career, preferring jobs in business and technology. Men are also more interested in being involved in management and negotiation duties. Women tend to prefer career fields in culture and service industries. They also care more about the quality of their relations with coworkers than men do.

Glass Ceiling

Women in western nations now work in fields that once were exclusively male such as: plumbers, doctors, lawyers, engineers, welders, and university professors. This has created changes in defining roles within the households of working women, particularly working mothers. Men are changing the definition of "fatherhood" to include feeding, cleaning, changing, and caring for babies. Not long ago, this would never have been considered appropriate (Eisler, 1995). Despite the changes that have occurred, much progress needs to be made before equality between the sexes can be attained at home and in the workplace.

Recent research by Kane and Sanchez (1994) concentrated on men's and women's attitudes about women in the workforce and the effect they have on the division of domestic labor. They found that women and men generally accept women working, but women continue to perform the bulk of household labor. Changes in household responsibilities appear more threatening to men than accepting women's presence in the workforce. "Assuming that women's positions are generally subordinate and/or in gender-segregated occupations, these changes are probably far less burdensome than those associated with taking responsibility for domestic labor," (Kane and Sanchez, 1994, p.1081).

Kane and Sanchez (1994) found that women are less comfortable complaining about domestic inequities because it constitutes a personal attack on the men in their lives, while complaining about work disparities is easier because it effects

more distant men and is not as personal. This has hindered expected changes in domestic responsibilities within two-earner households. The reciprocity between gender inequities, at work and at home, illustrates that equality cannot happen in one without equality in the other.

Kane and Sanchez (1994) also cite a study where 40 married couples were interviewed, some were dual-earner families and some were not. Overall, husbands did not think their wives' employment was disrupting their marriage unless they had been increasingly responsible for household duties along with it.

Although change is happening with women becoming more prominent in the workforce, research shows most women remain employed in gender-segregated occupations considered appropriate for women. Sadker and Sadker (1994) found:

> "Today, women are still only 17% of the nation's architects, 9% of the clergy, 8% of engineers, 3% of technicians, and 10% of dentists (up approximately 3% during the last decade) . On the woman's side of the glass wall, females comprise 83% of librarians, 86% of elementary school teachers, 88% of speech therapists, 95% of registered nurses, and 99% of kindergarten and preschool teachers, dental hygienists, and secretaries," (p.195) .

These figures make it obvious that the glass wall still plays a significant role in deciding what careers are open to men and women.

According to Dresselhaus (1996), physics professor at MIT, women were only 15% of all scientists as of 1988. Forty-eight percent of psychologists and 30%

of computer specialists were female. But, every other type of science career averaged between 0-15% women, illustrating that science careers remain as segregated as they were in past decades . Along these same lines, only 19% of medical school faculty is female and 67% of those positions are entry-level instructor positions (Bartuska, 1990) . These figures serve illustrate how little progress women have made in entering and succeeding within the fields of science and academia.

Other studies show women in almost every work sector earn less money than their male colleagues, even when comparisons are controlled for years of experience. Women's salaries are, on the average, 12-15% lower than men's salaries, except among assistant professors where there is no difference (Dresselhaus, 1996) .

Even among women who break into male dominated fields there exist wage disparities with their male counterparts. The Sadkers (1994) gathered wage information about lawyers and doctors. The average female lawyer in 1983 earned 89% of what her male contemporaries did, and by 1991, that fell to just 75%. This example demonstrates that while some fields are not seeing much progress, others are regressing in their treatment of female colleagues. The average female doctor will earn no more than 65% of the current male wage within the same discipline. This is the widest gender influenced wage gap found in any field.

Another aspect of gender bias is seen in black women earning less than their

white contemporaries. This partly explains why they view many feminist efforts as merely being aimed at redistributing money between white men and white women. These efforts typically focus on comparable pay for comparable work. This seems fair and acceptable except that black women are often unable to obtain comparable work. Black women, researchers found, are mainly employed as cooks and housekeepers. White women are mostly hired as dental assistants and in secretarial positions (Beron, England, & Kilbourne, 1994). Gender-bias is not experienced the same by all women, therefore no collective effort has emerged to successfully combat it.

In relation to this, Beron, England, and Kilbourne (1994) also point out that black women have had higher rates of participation in the labor force than white women, when averaged over this century. White women have less job experience, overall, than their black counterparts. This disproves the theory that job experience differences explain the gap in women's compensation. Even if comparable pay for comparable work is ever achieved, equality still won't exist due to the glass wall preventing so many women from entering better paying professions.

The brighter side of this picture, for black women, is their increasing presence in industry as business owners and managers. Brown (1996) found minority women to be the fastest growing segment of the increasing number of female business owners. At the time of this study, 8 million women-owned businesses existed in America, and by the year 2000, it is expected that 50% of all businesses

will be owned by women. Women entrepreneurs have increased by 78% since 1987. This demonstrates that career growth is happening for women on some fronts. Equality is possible and being achieved.

Total earnings for female-owned businesses have tripled in the last 10 years and they employ more than a quarter of the U.S. workforce, which is more than all the Fortune 500 companies combined. All of this, mainly accomplished in the last 10 years, has been contrary to the still popular belief that women are not business-minded. This growth in female businesses is mostly occurring in male dominated industries: agriculture is up 130%; construction, 127%; manufacturing, 112%; transportation, 140%; and wholesale trade is up 157% (Brown, 1996) .

Despite this impressive progress and success on the part of women, the glass ceiling is still apparent. Tannen refers to a 1991 study by the U.S. Department of Labor in her book Talking From 9 to 5 (1994) . She refers to the glass ceiling as an invisible barrier keeping women from rising to the top of their professions. From 1979 to 1989, women and minorities in top executive positions of the 1,000 largest U.S. corporations rose from 3% to only 5%. During this period, women in companies increased to 37% of employees, 17% of management, and 6.5% of top level executives.

Tannen (1994) also makes mention of statements from working professional women whom she interviewed. These women were commenting about some of the problems they have experienced simply trying to get equal credit for the work they

do. A well-respected physician who works at a university commented about her experience. She believes she would have already become a department head, had she been a man. Another interviewee heads a large division within the company she works for. She has been given the title of "Director" when she is responsible for the same work as her male counterparts titled "Vice-President". Equal credit for equal work has become a growing issue for many professional women.

CHAPTER 3

Method

Participants

The population used in this study consisted of 50 freshmen psychology students at Lindenwood University. Of the students, in the classes asked to participate, the first 50 volunteers were used. All students were guaranteed anonymity and confidentiality. Participants were required to include information on their age and gender. Students participating in the study were given extra credit towards their final grade in class.

Of the 50 packets issued, seven (14%) were not returned. Four, of the returned survey packets, were not completed. Thirty-nine surveys were completed and returned, producing usable results.

From the 39 usable responses, 26 (67%) identified themselves as female, and 13 (33%) as male. Of the 26 females: one was 17 years old, 19 women were 18 years old, four were 19 years old, and two of the women were 20 years old. Of the 13 males: one was 16 years old, two men were 17 years old, seven men were 18 years old, two were 19 years old, and one man was 23 years old.

Materials

A machine-scored version of the Campbell Interest and Skill Survey (CISS) (Appendix A) was utilized through the Research Assistance Program offered by

NCS Assessments.

The CISS is a 320 item inventory measuring subjects' self-report of career interests and capabilities. The first 200 items reflect subjects' interest in various occupations, educational interests, and activities. Participants respond to items using a six point Likert scale including response choices of: strongly like, like, slightly like, slightly dislike, dislike, and strongly dislike.

The final 120 items reflect participants' confidence in their skills or abilities involving career duties, educational tasks, and recreational activities. Subjects respond using another six point Likert scale including the assessments: expert, good, slightly above average, slightly below average, poor, and none. Subjects were instructed to respond to items using their most immediate response.

Included in each packet was a cover sheet (see Appendix B) . This form reviewed the instructions for completing the survey and contained signature blanks for the participants. This was also utilized as a record for the professor, showing which students were due extra credit, since names were not required on the survey booklets. The booklet contains the machine-scored answer sheet.

Normative data was collected from 1,790 female respondents and 3,435 male respondents, with raw score means calculated for each group. These were then averaged to allow each sex equal weighting. The results include norms for 65 diverse occupations. The median correlation for the like-named Skill and Interest Orientations was .70. This correlation was used to support the validity of this

instrument.

The reliability coefficients of the CISS orientation scales range between .76 to .93, with a median of .87. This demonstrates the CISS has high internal consistency, reflecting it's ability to measure the variables in question. Test-retest reliability ranged from .81 to .87.

Procedure

Each of the 50 freshmen student volunteers received a packet containing a CISS booklet and a cover sheet, prepared by the researcher. The cover letter introduced the researcher, summarized the purpose of the study, and provided specific instructions about the survey.

Subjects were instructed to provide information on their gender, date of birth, and level of education. Placing their name on the booklet was optional, to protect anonymity. Subjects were also requested to put their name and class session on their cover letter so their professor could credit their participation. The researcher verbally explained directions about returning the cover letter to the professor. It was emphasized the letters would not be used in the study.

Participants were instructed on when, and to whom, the packet, including the survey and cover letter, needed to be returned. They were given a week for completion. Collection of the surveys was handled by Dr. Utley, the class instructor. The introduction of the study and review of instructions was done by

the author.

Design

The CISS answer sheets were sent to NCS and machine-scored. NCS provides this service in return for a copy of the completed project utilizing their testing materials and scoring service. The scored surveys were statistically analyzed through the use of descriptive statistics and the one-way analysis of variance (ANOVA) . The ANOVA analyses were used to test each of the occupational interest and ability variables in regard to gender. These results were then compared with the null hypotheses to determine whether any gender differences exist.

CHAPTER 4

Results

The surveys were categorized based on gender. Of the 39 surveys examined, 26 were from female participants and 13 from male participants. The surveys involved interest and ability questions from 7 occupational categories: influencing, analyzing, producing, adventuring, organizing, helping, and creating.

Influencing careers described in the CISS manual include occupations such as law, politics, sales, and advertising. Analyzing careers include mathematical and scientific occupational fields. Producing careers include farming, manufacturing, and animal care careers. Adventuring occupations would include physical fitness, law enforcement, and military careers. These categories are all considered male-dominated fields.

Female-oriented fields include organizing, helping, and creating occupations. Organizing careers include financial and office services occupations. Helping occupations include medical, counseling, and children's service fields of work. Creating careers include writing, art, design, fashion, and performing arts fields. Table 1 shows the results of the scores from the 39 surveys.

Of the 39 surveys, the mean scores for the occupational groups were as follows: influencing (47.05), analyzing (44.85), producing (44.51), adventuring (56.74), organizing (50.08), helping (55.87), and creating (47). The average age of

participants was 18.38 with a standard deviation of .96. Table 1 shows the largest standard deviations in the categories of influencing (11.32), production (10.35), organizing (10.48), helping (9.95), and analyzing careers (9.55).

TABLE 1. Distribution of Occupational Interest Scores

Valid Cases: 39 Missing cases: 0

Variable	Mean	Std Dev	Minimum	Maximum	N	Label
AGE	18.38	.96	17.00	23.00	39	Age of Participant
SEX	1.67	.48	1.00	2.00	39	Participant's sex
IINFL	47.05	11.32	20.00	68.00	39	Interest in influencing careers
IANALY	44.85	9.55	30.00	62.00	39	Interest in analyzing careers
IPROD	44.51	10.35	28.00	71.00	39	Interest in producing careers
IADVEN	56.74	9.07	35.00	72.00	39	Interest in adventuring careers
IORG	50.08	10.48	30.00	72.00	39	Interest in organizing careers
IHELP	55.87	9.95	30.00	76.00	39	Interest in helping careers
ICREAT	47.00	9.38	27.00	69.00	39	Interest in creating careers

Table 2 shows the analysis of scores for the overall sample on each category of occupation based on demonstrated interest. The range, standard deviation, and amount of variance are highest in influencing, producing, organizing, and helping career categories. This indicates these categories are the most likely to produce significant differences in responses based on gender.

The first task regarding the research hypotheses involves determining if a difference exists in the number of men and women interested in male-dominated careers and vice versa. A simple tally would show nothing since 66% of the

TABLE 2: Interest Responses by Occupations

Variable	Range	Std Dev	Kurtosis	Std Err	Variance	Skewness
IINFL	48.00	11.32	-.39	1.83	128.55	-.271
IANALY	32.00	9.54	-1.134	1.53	91.19	.202
IPROD	43.00	10.35	-.496	1.66	107.10	.431
IADVEN	37.00	9.07	-.72	1.45	82.2	-.183
IORG	42.00	10.48	-.497	1.68	109.81	-.138
IHELP	46.00	9.95	.211	1.59	98.96	-.198
ICREAT	42.00	9.38	-.45	1.5	88.0	.136

Valid cases=39 Missing cases=0

TABLE 3: Interest in Occupations by Gender

Variable	Male Mean	Male S.D.	Female Mean	Female S.D.	Grand Mean/S.D.
IINFL	53.69	6.48	43.73	11.84	47.05 / 11.32
IANALY	48.30	7.38	43.12	10.16	44.85 / 9.55
IPROD	49.00	10.05	42.27	9.93	44.51 / 10.35
IADVEN	62.77	7.58	53.73	8.31	56.74 / 9.07
IORG	56.46	6.99	46.88	10.57	50.08 / 10.48
IHELP	51.54	9.04	58.03	9.82	55.87 / 9.95
ICREAT	43.77	9.35	48.62	9.15	47.00 / 9.38

participants are female. The standard deviation of female scores on interest in influencing careers is much larger than that of male scores (Table 3). This is also true of female versus male scores on interest in analyzing and organizing careers. Scores for males and females showed the least amount of variance in the creating occupations with a standard deviation of 9.38 for the entire sample, 9.35 for males and 9.15 for females.

The mean for males on interest in influencing careers is above the average whereas the female mean is below the average. The same is seen in the male versus female means in interest in analyzing, producing, adventuring, and organizing careers.

The mean for females on interest in helping and creating careers is above the

sample mean and the male average is below. The differences and distribution of the scores indicate the null hypothesis may be rejected, but further analysis is necessary to determine this.

TABLE 4: Distribution of Occupational Ability Scores

Variable	Mean	Std Dev	Minimum	Maximum	N	Label
AGE	18.38	.96	17.00	23.00	39	Age of participant
SEX	1.67	.48	1.00	2.00	39	Participant's sex
AINFL	43.90	11.33	24.00	71.00	39	Ability in influencing careers
AANALY	45.95	10.33	32.00	71.00	39	Ability in analyzing careers
APROD	47.38	9.28	34.00	66.00	39	Ability in producing careers
AADVEN	55.54	9.12	35.00	73.00	39	Ability in adventuring careers
AORG	42.74	12.53	25.00	76.00	39	Ability in organizing careers
AHELP	48.56	11.22	20.00	71.00	39	Ability in helping careers
ACREAT	50.49	8.47	32.00	67.00	39	Ability in creating careers

Table 4 lists the mean, standard deviation, minimum, and maximum values for all of the sample participant's scores on self reported ability in each of the listed occupational categories.

TABLE 5 : Ability in Occupations by Gender

Variable	Male Mean	Male S.D.	Female Mean	Female S.D.	Grand Mean/S.D.
AINFL	48.15	11.31	41.77	10.94	43.9 / 11.33
AANALY	50.23	10.15	43.8	9.92	45.95 / 10.33
APROD	54.3	7.33	43.92	8.23	47.38 / 9.28
AADVEN	61.53	6.58	52.54	8.81	55.54 / 9.12
AORG	48.46	9.96	39.88	12.86	42.74 / 12.52
AHELP	48.69	12.87	48.5	10.58	48.56 / 11.22
ACREAT	50.38	8.82	50.54	8.46	50.49 / 8.47

Table 5 summarizes general statistics comparing male and female scores of self-reported ability in each of the listed occupational categories. The largest standard deviations are found in: influencing, analyzing, organizing, and helping occupational measures. This reflects the greater possibility for significant findings in these categories.

In order to complete the examination of the effects of gender on survey responses, a one-way analysis of variance (ANOVA) was performed on each of

the occupational variables. The underlying assumption in using an ANOVA is that scores are distributed normally (Norusis, 1991). This technique was used to test the null hypothesis by testing all of the group means and comparing them. The one-way ANOVA was used since the variables are being compared by only one variable, gender. Table 6 shows the results of the one-way ANOVA for each of the interest occupational categories by gender.

The results are examined by reviewing two types of variability. Within group variability measures how much variability exists in the observations in a chosen group. This measure estimates the variance occurring in that group in the population. Between group variability measures the amount of variability existing between the various group means, the two gender groups in this instance.

If the null hypothesis is accepted, the within group mean squares and the between group mean squares should be close in value. And, when one of these values is divided by the other, the ratio will be close to one. This is the F ratio. The F ratio is then compared with the F probability to determine if the null hypothesis should be accepted or rejected based on the results.

Appendix C includes a table showing the ANOVA results of interest scores by gender. The interest values in influencing produced a significant difference when comparing scores by gender, ($F = 7.93$ $p < .05$) . The mean for males was 48.15 compared to the female mean of 41.77 . Thus, the null hypothesis would be rejected since probability did not exceed the alpha level.

Values produced by the one-way ANOVA for interest in analyzing careers showed a difference that cannot be considered significant at the .05 level, ($F = 2.6754$ $p > .05$) . The researcher then accepted the null hypothesis .

The ANOVA values for interest in producing careers had a significant difference in scores between the genders with ($F = 3.95$ $p = .05$) . This indicates the null hypothesis should be rejected for producing career interests.

ANOVA values for interest in adventuring careers created a significant difference when compared at the pre-set .05 alpha level ($F = 10.8455$ $p < .05$) . This caused the null hypothesis to be rejected with this variable.

Interest in organizing careers produced ANOVA values which reject the null hypothesis ($F = 8.7068$ $p < .05$) . This indicates there is a significant difference in the amount of interest men and women report for organizing occupations .

ANOVA values for interest in helping careers show a significant difference in the male and female scores ($F = 3.99$ $p = .05$) . Therefore, the null hypothesis of there being no gender-based difference, would be rejected.

Interest in creating jobs produce ANOVA values demonstrating no significant difference in the male and female scores ($F = 2.398$ $p > .05$). Due to this, the null hypothesis is accepted.

Appendix D lists the results of ANOVA treatment analyses of the self-reported ability scores for each of the occupational groups, separated by gender. ANOVA

scores for ability in influencing careers created ($F = 2.8866$ $p > .05$) results that reflect no significant difference in male and female scores on ability in influencing careers. This would indicate the null hypothesis should be accepted.

Ability scores for analyzing careers produced ANOVA values that are not significant enough to reject the null hypothesis, yet illustrate a trend in the male and female scores ($F = 3.581$ $p = .06$) .

ANOVA scores for ability in producing careers produced results reflecting a significant difference in male and female scores ($F = 14.7995$ $p < .05$) . So, it is appropriate to reject the null hypothesis for this variable.

Ability in adventuring careers had ANOVA results rejecting the null hypothesis. The results ($F = 10.5513$ $p < .05$) highlight a significant difference in the level of self-reported ability of males and females in adventuring occupations.

Ability in organizing occupations produced ANOVA values which reject the null hypothesis. The results reflect a significant difference in male and female responses for this variable ($F = 4.4309$ $p < .05$) .

ANOVA scores for ability in helping careers did not show a significant difference in responses when compared by gender. The results ($F = .0025$ $p > 05$) cause the null hypothesis to be accepted.

Ability in creating careers displayed ANOVA values ($F = .0028$ $p > .05$) that indicate the null hypothesis should be accepted . No significant difference was found in male versus female self-reported ability for this variable.

Table 6 presents a comparison summary of all the ANOVA results for this study. Most of the interest and ability ANOVA results were concurrent. More interest, than ability, results supported the research showing men and women demonstrate different levels of interest and self-reported ability for male and female-dominated occupations.

The results support the research hypotheses that differences in interest exist based on gender in the influencing, producing, adventuring, organizing, and helping occupations.

TABLE 6 : ANOVA Results Comparison for Interest and Ability Scores

Variable	ANOVA	Variable	ANOVA
IINFL	Ho reject	AINFL	Ho accept
IANALY	Ho accept	AANALY	Ho accept
IPROD	Ho reject	APROD	Ho reject
IADVEN	Ho reject	AADVEN	Ho reject
IORG	Ho reject	AORG	Ho reject
IHELP	Ho reject	AHELP	Ho accept
ICREAT	Ho accept	ACREAT	Ho accept

The results that did not support the research hypotheses involved the analyzing and creating occupational categories. No significant difference in interest scores could be found through comparing male and female scores.

Ability results rejecting the null hypothesis that no differences in self-reported

levels of ability exist, based on gender, were found in the producing, adventuring, and organizing careers. Results accepting the null hypothesis for ability were found in the categories of : influencing, helping, and creating occupations. Results for self-reported ability in analyzing careers reflect a trend for males and females responding differently though the results were not strong enough to be listed as significant.

CHAPTER 5

Discussion

This study examined differences in male and female educational and career choices. Male and female scores on the CISS, an educational and occupational survey measuring self-reported interests and abilities, were compared to assess whether or not gender based differences exist.

The theory of gender differences in interest scores was supported by the results from the ANOVA in the influencing, adventuring, and organizing occupational categories. Significant differences were also found in the reported ability scores for producing, adventuring, and organizing occupations.

Two categories resulted in split interest and ability results on the ANOVA . Significant gender differences for interest scores in the influencing and helping occupations were confirmed through the ANOVA . Though, influencing and helping ability scores treated with the ANOVA did not illustrate significant gender differences.

The results indicate a measurable significant difference in the level of interest and ability between males and females for half of the occupational categories. These differences were seen in several occupational types, where expected, including producing, organizing, and adventuring careers. This includes career choices of : secretary, bank manager, electrician, architect, police officer, and pilot. Most of these are male dominated, affluent careers that openly discourage the

entrance of female colleagues.

Literature reviewed for this study supported the theory that women dominate the helping and creating career fields. The results of this study indicate this is simply a matter of interest . ANOVA tests show no difference in male and female reported levels of ability in these fields . Though, the ANOVA showed a significant difference in male versus female level of interest in the helping professions.

Helping and creating occupational fields include positions such as: social workers, counselors, teachers, artists, librarians, and writers. Although males and females scored similarly on ability ratings in these categories, these fields remain female dominated. It should be noted that these careers, though respected, do not tend to be lucrative .

The major conclusion of this researcher is that many careers tend to be gender segregated. This is the result of socialization effects from peers, teachers, and parents supporting gender segregation. Another prominent factor in the gender segregation of professions is compensation. Women, on the average, appear to be willing to accept less than their male counterparts.

Limitations of the Study

The researcher found several limitations while performing this study. Two limitations exist in the design of the study. The CISS was sent home with participants rather than being completed in a timed session format. This was

necessary due to the length of the survey and lacking an adequate amount of classroom time to complete the survey. Also, twice as many women as men volunteered to participate in this study. Statistical procedures were utilized compensating for this fact, so not to skew the results. Though, the results would be more powerful if the sample was larger and more representative of the gender ratio in the population.

Certain definitions posed difficulty to this study. Masculinity and femininity are not defined in the research reviewed in concrete terms. Also, the literature used for this study relied heavily on research by the Sadkers because they are at the forefront of the research movement on gender issues.

Finally, the CISS category of organizing was difficult to classify in regards to including mostly male or female careers. This category includes jobs like secretary, bank manager, insurance agent, retail manager, hospital administrator, accountant, and bookkeeper. Since the included office duties are typically handled by female workers and management duties dominated by male employees, this category was difficult to utilize in a gender comparison study.

APPENDIX A : CISS SURVEY

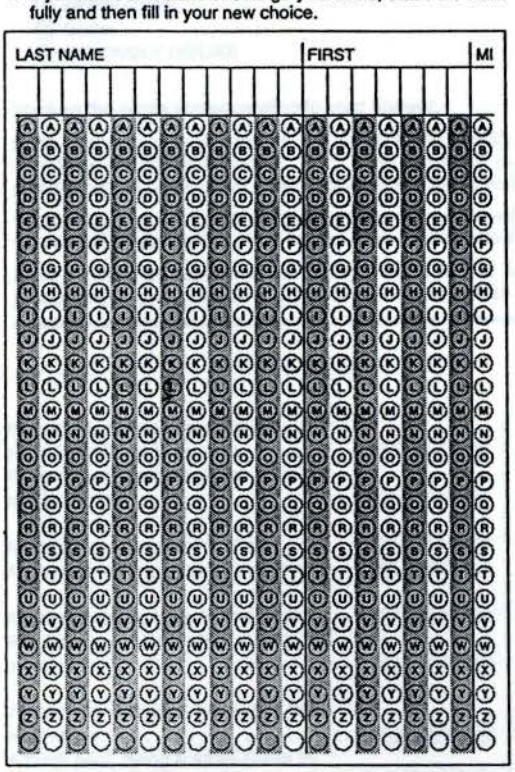
CISS®
Campbell Interest and Skill Survey™

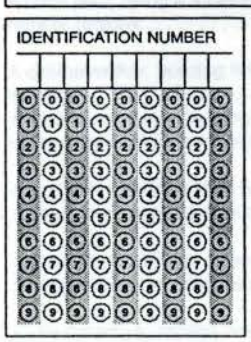
MICROTEST Q
Assessment System

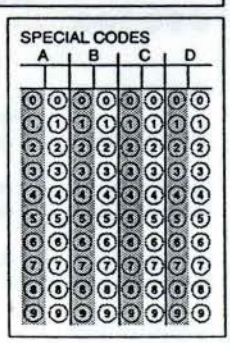
Product Number
26480

DIRECTIONS:

1. Use a soft black lead pencil only and make a heavy, dark mark when filling in the circles. Begin by printing your name in the boxes below. Print your last name first, as many letters as possible. Do the same for your first name and middle initial. Blacken the circle below each box that corresponds to the letter in the box.
2. In a similar way, complete the boxes for Today's Date, Birth Date, Years in Occupation, and Identification Number. **Identification Number and Birth Date are required for computer processing.**
3. Complete the information in the other boxes. Fill in the Special Codes section only if you are asked to do so.
4. If you make a mistake or change your mind, erase the mark fully and then fill in your new choice.







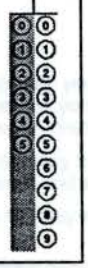
Your Organization or School:

Your Address:

Phone: _____ – _____ – _____

If employed full-time, please complete the following questions. This information is being collected for research purposes only.

Years in Occupation



JOB TITLE:

OCCUPATION:

How well do you like your work?

1. I like it a lot
2. I like it
3. I am indifferent to it
4. I dislike it

What is your highest level of education?

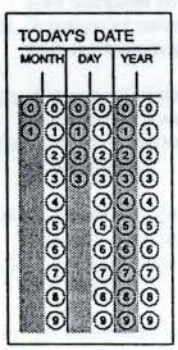
1. Some high school
2. High school graduate
3. Some college
4. Vocational training
5. College graduate
6. Master's level degree
7. Doctoral level degree

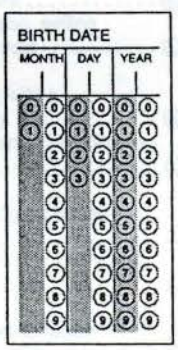
GENDER

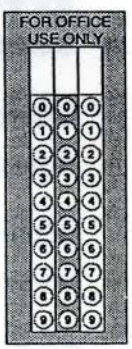
1. Male
2. Female

RACE

1. African American
2. Asian American
3. Hispanic/Latino
4. Native American
5. White
6. Other







PART I—INTERESTS

The major purpose of this section is to assess your interests to determine the areas of work where you would be most likely to find satisfying activities.

Following are lists of occupations, school subjects, and varied work activities. Indicate how much you like each item by using the following scale:

- Ⓛ **STRONGLY LIKE**
- Ⓛ Like
- Ⓘ slightly like
- ⓓ slightly dislike
- Ⓓ Dislike
- Ⓓ **STRONGLY DISLIKE**

Blacken the circle corresponding to your answer.

Don't worry about how good you would be at the activity, or whether you would be successful—just whether or not you would enjoy doing it. Don't think about how much money you might make, or how much status or prestige would be involved. Base your answer solely on how much you would like it.

Work quickly. Your first impression is generally most useful. You may wish to look up from your paper every now and then and take a short break. This will help you stay fresh and alert.

Mark carefully on the sheet, using only a No. 2 pencil. Make no stray marks or creases. This sheet will be processed by computer, so it needs to be neat and clean.

1. An actor or actress, performing on the stage, TV, or in movies. . . . . ⓁⓁⒾⓓⒹⒹ
2. An architect, designing new homes and buildings . . . . . ⓁⓁⒾⓓⒹⒹ
3. An artist, creating works of art . . . . . ⓁⓁⒾⓓⒹⒹ
4. An author, writing stories and novels . . ⓁⓁⒾⓓⒹⒹ
5. A baker, making breads and pastries . . ⓁⓁⒾⓓⒹⒹ
6. A building superintendent, managing a maintenance staff . . . . . ⓁⓁⒾⓓⒹⒹ
7. A bulldozer operator, helping to build new roads. . . . . ⓁⓁⒾⓓⒹⒹ
8. A bush pilot, flying a small plane in remote regions . . . . . ⓁⓁⒾⓓⒹⒹ
9. A cabinetmaker, building fine furniture . . . . . ⓁⓁⒾⓓⒹⒹ
10. A career counselor, helping people make important career decisions . . . . . ⓁⓁⒾⓓⒹⒹ
11. A carpenter, building new homes . . . . . ⓁⓁⒾⓓⒹⒹ
12. A chef, preparing gourmet meals . . . . . ⓁⓁⒾⓓⒹⒹ
13. A chemist, working in a research lab . . ⓁⓁⒾⓓⒹⒹ
14. A circus clown, making people laugh . . ⓁⓁⒾⓓⒹⒹ
15. A city detective, solving crimes . . . . . ⓁⓁⒾⓓⒹⒹ
16. A clothing designer, creating new fashions . . . . . ⓁⓁⒾⓓⒹⒹ
17. A coach, working with athletic teams . . ⓁⓁⒾⓓⒹⒹ
18. A college professor, teaching and doing research . . . . . ⓁⓁⒾⓓⒹⒹ
19. A commercial designer, designing new products . . . . . ⓁⓁⒾⓓⒹⒹ
20. A computer programmer, creating new computer software . . . . . ⓁⓁⒾⓓⒹⒹ
21. A computer salesperson, selling high-technology products . . . . . ⓁⓁⒾⓓⒹⒹ
22. A dancer, performing with a professional company . . . . . ⓁⓁⒾⓓⒹⒹ
23. A day care worker, caring for children during the day . . . . . ⓁⓁⒾⓓⒹⒹ
24. A diplomat, negotiating agreements between countries . . . . . ⓁⓁⒾⓓⒹⒹ
25. A drama director, directing plays and TV shows . . . . . ⓁⓁⒾⓓⒹⒹ
26. An economist, predicting future economic trends. . . . . ⓁⓁⒾⓓⒹⒹ
27. An elected official, developing new public programs . . . . . ⓁⓁⒾⓓⒹⒹ

Please go to the next page.

Ⓛ **STRONGLY LIKE**
Ⓛ **Like**
Ⓘ **slightly like**
ⓓ **slightly dislike**
Ⓓ **Dislike**
Ⓓ **STRONGLY DISLIKE**

28. An electrician, installing electrical systems ..... ⓁⓁⒾⓓⒹⒹ
29. An elementary school teacher, helping young children develop ..... ⓁⓁⒾⓓⒹⒹ
30. An engineer, designing large building projects ..... ⓁⓁⒾⓓⒹⒹ
31. A factory superintendent, managing a large manufacturing plant ..... ⓁⓁⒾⓓⒹⒹ
32. A farmer, raising and harvesting crops. . ⓁⓁⒾⓓⒹⒹ
33. A fashion buyer, making decisions about purchasing new styles ..... ⓁⓁⒾⓓⒹⒹ
34. A financial vice president, responsible for a company's finances ..... ⓁⓁⒾⓓⒹⒹ
35. A foreign language translator, working overseas ..... ⓁⓁⒾⓓⒹⒹ
36. A forester, managing timber resources.. ⓁⓁⒾⓓⒹⒹ
37. A hairstylist, working in an elite salon. ..... ⓁⓁⒾⓓⒹⒹ
38. A health club manager, helping people exercise ..... ⓁⓁⒾⓓⒹⒹ
39. A high school teacher, working with teenagers ..... ⓁⓁⒾⓓⒹⒹ
40. An interior designer, planning room layouts. ..... ⓁⓁⒾⓓⒹⒹ
41. An international tour guide, taking people to other countries ..... ⓁⓁⒾⓓⒹⒹ
42. An inventor, inventing new products ... ⓁⓁⒾⓓⒹⒹ
43. A jeweler, selling expensive jewelry.... ⓁⓁⒾⓓⒹⒹ
44. A judge, presiding over a courtroom ... ⓁⓁⒾⓓⒹⒹ
45. A laboratory researcher, doing scientific experiments ..... ⓁⓁⒾⓓⒹⒹ
46. A life insurance salesperson, helping people with their estate planning ..... ⓁⓁⒾⓓⒹⒹ
47. A manager of a fruit grove, growing fruit commercially ..... ⓁⓁⒾⓓⒹⒹ
48. A manager of a kennel, caring for animals ..... ⓁⓁⒾⓓⒹⒹ
49. A marketing director, planning marketing strategies ..... ⓁⓁⒾⓓⒹⒹ
50. A mathematics instructor, teaching math concepts ..... ⓁⓁⒾⓓⒹⒹ
51. A medical researcher, running experiments in a hospital ..... ⓁⓁⒾⓓⒹⒹ
52. A military officer, commanding an outstanding military unit ..... ⓁⓁⒾⓓⒹⒹ
53. A minister, priest, or rabbi, serving a congregation ..... ⓁⓁⒾⓓⒹⒹ
54. A musician, performing music for audiences. ..... ⓁⓁⒾⓓⒹⒹ
55. A night club entertainer, doing comedy routines. ..... ⓁⓁⒾⓓⒹⒹ
56. A nurse, caring for patients in a hospital. ..... ⓁⓁⒾⓓⒹⒹ
57. A nursery school teacher, working with young children ..... ⓁⓁⒾⓓⒹⒹ
58. A nutritionist, advising people on their diets.. ..... ⓁⓁⒾⓓⒹⒹ
59. An office manager, overseeing a clerical staff ..... ⓁⓁⒾⓓⒹⒹ
60. An over-the-road truck driver, driving big trucks ..... ⓁⓁⒾⓓⒹⒹ
61. A paramedic, giving first aid to accident victims ..... ⓁⓁⒾⓓⒹⒹ
62. A photographer, taking pictures for a news magazine ..... ⓁⓁⒾⓓⒹⒹ
63. A physical therapist, helping people recover from injuries. ..... ⓁⓁⒾⓓⒹⒹ
64. A physician, helping patients with their health problems ..... ⓁⓁⒾⓓⒹⒹ
65. A playground director, arranging games and contests. ..... ⓁⓁⒾⓓⒹⒹ
66. A police captain, in charge of a police precinct. ..... ⓁⓁⒾⓓⒹⒹ
67. A probation officer, working with parolees and the courts ..... ⓁⓁⒾⓓⒹⒹ
68. A professional athlete, competing against others. ..... ⓁⓁⒾⓓⒹⒹ
69. A prospector, looking for minerals in unexplored areas ..... ⓁⓁⒾⓓⒹⒹ
70. A psychologist, studying human behavior ..... ⓁⓁⒾⓓⒹⒹ

71. A realtor, selling private homes ..... ⓁⓁⓘⓓⒹⒹ
72. A religious leader, preaching about spiritual life ..... ⓁⓁⓘⓓⒹⒹ
73. A reporter, writing articles for a newspaper..... ⓁⓁⓘⓓⒹⒹ
74. A restaurant manager, in charge of a well-established restaurant ..... ⓁⓁⓘⓓⒹⒹ
75. A sales executive, overseeing a chain of retail stores ..... ⓁⓁⓘⓓⒹⒹ
76. A school principal, managing teachers and students..... ⓁⓁⓘⓓⒹⒹ
77. A singer, performing with a band in dinner clubs..... ⓁⓁⓘⓓⒹⒹ
78. A speech instructor, helping people improve their speaking techniques .... ⓁⓁⓘⓓⒹⒹ
79. A state governor, directing state affairs ..... ⓁⓁⓘⓓⒹⒹ
80. A stockbroker, advising clients on their investments..... ⓁⓁⓘⓓⒹⒹ
81. A symphony conductor, leading a symphony orchestra ..... ⓁⓁⓘⓓⒹⒹ
82. A technical writer, preparing scientific manuals ..... ⓁⓁⓘⓓⒹⒹ
83. A top executive, managing a large corporation..... ⓁⓁⓘⓓⒹⒹ
84. A trial lawyer, arguing cases in court ..... ⓁⓁⓘⓓⒹⒹ
85. A university president, overseeing a major university..... ⓁⓁⓘⓓⒹⒹ

For questions 86 through 128, show how you would feel about studying each of these school subjects by choosing one of the following:

Ⓨ **YES, YES, I definitely would like to study this subject.**
Ⓨ YES, I would like to study this subject.
ⓨ yes, I feel slightly more positive than negative about studying this subject.
ⓝ no, I feel slightly more negative than positive about studying this subject.
Ⓝ NO, I would not like to study this subject.
Ⓝ **NO, NO, I definitely would not like to study this subject.**

Don't worry about your ability, just whether or not you would enjoy studying the subject.

86. Advertising ..... ⓎⓎⓨⓝⓃⓃ
87. Agriculture..... ⓎⓎⓨⓝⓃⓃ
88. Algebra ..... ⓎⓎⓨⓝⓃⓃ
89. Architecture ..... ⓎⓎⓨⓝⓃⓃ
90. Art..... ⓎⓎⓨⓝⓃⓃ
91. Auto Mechanics ..... ⓎⓎⓨⓝⓃⓃ
92. Beauty and Hair Care ..... ⓎⓎⓨⓝⓃⓃ
93. Chemistry ..... ⓎⓎⓨⓝⓃⓃ
94. Child Development ..... ⓎⓎⓨⓝⓃⓃ
95. Computer Science ..... ⓎⓎⓨⓝⓃⓃ
96. Cooking ..... ⓎⓎⓨⓝⓃⓃ
97. Creative Writing ..... ⓎⓎⓨⓝⓃⓃ
98. Electronics ..... ⓎⓎⓨⓝⓃⓃ
99. Engineering ..... ⓎⓎⓨⓝⓃⓃ
100. First Aid ..... ⓎⓎⓨⓝⓃⓃ
101. Foreign Languages ..... ⓎⓎⓨⓝⓃⓃ
102. Forestry ..... ⓎⓎⓨⓝⓃⓃ
103. Group Dynamics ..... ⓎⓎⓨⓝⓃⓃ
104. Hotel Management ..... ⓎⓎⓨⓝⓃⓃ
105. Law Enforcement ..... ⓎⓎⓨⓝⓃⓃ
106. Leadership ..... ⓎⓎⓨⓝⓃⓃ
107. Literature ..... ⓎⓎⓨⓝⓃⓃ
108. Marketing ..... ⓎⓎⓨⓝⓃⓃ
109. Martial Arts (Judo, Karate, etc.) .... ⓎⓎⓨⓝⓃⓃ
110. Mathematics ..... ⓎⓎⓨⓝⓃⓃ
111. Medicine ..... ⓎⓎⓨⓝⓃⓃ
112. Military Strategies ..... ⓎⓎⓨⓝⓃⓃ
113. Music ..... ⓎⓎⓨⓝⓃⓃ
114. Nursing ..... ⓎⓎⓨⓝⓃⓃ
115. Office Practices ..... ⓎⓎⓨⓝⓃⓃ
116. Physics ..... ⓎⓎⓨⓝⓃⓃ
117. Plants and Gardens ..... ⓎⓎⓨⓝⓃⓃ
118. Political Science ..... ⓎⓎⓨⓝⓃⓃ
119. Psychology ..... ⓎⓎⓨⓝⓃⓃ
120. Public Speaking ..... ⓎⓎⓨⓝⓃⓃ
121. Real Estate ..... ⓎⓎⓨⓝⓃⓃ
122. Sales Techniques ..... ⓎⓎⓨⓝⓃⓃ
123. Social Work..... ⓎⓎⓨⓝⓃⓃ
124. Tax Planning ..... ⓎⓎⓨⓝⓃⓃ
125. Theater Arts ..... ⓎⓎⓨⓝⓃⓃ
126. Typing ..... ⓎⓎⓨⓝⓃⓃ
127. Welding ..... ⓎⓎⓨⓝⓃⓃ
128. Woodworking ..... ⓎⓎⓨⓝⓃⓃ

Please go to the next page.

Following is a list of activities. Indicate as before how much you would like doing them.

Ⓛ **STRONGLY LIKE**
Ⓛ **Like**
Ⓘ **slightly like**
ⓓ **slightly dislike**
Ⓓ **Dislike**
Ⓓ **STRONGLY DISLIKE**

129. Act in a local theater production ..... ⓁⓁⒾⓓⒹⒹ
130. Advise others on their wardrobes and grooming ..... ⓁⓁⒾⓓⒹⒹ
131. Appraise the value of jewelry or antiques ..... ⓁⓁⒾⓓⒹⒹ
132. Attend religious services ..... ⓁⓁⒾⓓⒹⒹ
133. Belong to a military drill unit ..... ⓁⓁⒾⓓⒹⒹ
134. Build an outside deck or balcony on a house ..... ⓁⓁⒾⓓⒹⒹ
135. Calculate payroll deductions for a working force ..... ⓁⓁⒾⓓⒹⒹ
136. Care for a herd of cattle or horses .... ⓁⓁⒾⓓⒹⒹ
137. Care for sick people ..... ⓁⓁⒾⓓⒹⒹ
138. Compete in an athletic contest ..... ⓁⓁⒾⓓⒹⒹ
139. Conduct religious ceremonies ..... ⓁⓁⒾⓓⒹⒹ
140. Deal with emergencies where people are in danger ..... ⓁⓁⒾⓓⒹⒹ
141. Design the landscaping for a large garden ..... ⓁⓁⒾⓓⒹⒹ
142. Develop a marketing strategy for a new consumer product ..... ⓁⓁⒾⓓⒹⒹ
143. Develop new varieties of plants and flowers ..... ⓁⓁⒾⓓⒹⒹ
144. Do exercises to improve your body . ⓁⓁⒾⓓⒹⒹ
145. Engage in exciting, dangerous adventures ..... ⓁⓁⒾⓓⒹⒹ
146. Experiment with new ways of preparing food ..... ⓁⓁⒾⓓⒹⒹ
147. Explain a complicated scientific concept to others ..... ⓁⓁⒾⓓⒹⒹ
148. Figure out why a small gasoline engine won't work ..... ⓁⓁⒾⓓⒹⒹ
149. File a lawsuit to straighten out an injustice ..... ⓁⓁⒾⓓⒹⒹ
150. Give a speech to a large group .... ⓁⓁⒾⓓⒹⒹ
151. Go parachuting or hang gliding .... ⓁⓁⒾⓓⒹⒹ
152. Help develop leadership talents in other people ..... ⓁⓁⒾⓓⒹⒹ
153. Interview people applying for a job . ⓁⓁⒾⓓⒹⒹ
154. Introduce an after-dinner speaker .. ⓁⓁⒾⓓⒹⒹ
155. Lay out the advertisements for a magazine ..... ⓁⓁⒾⓓⒹⒹ
156. Lead the calisthenics in a physical fitness program ..... ⓁⓁⒾⓓⒹⒹ
157. Maintain an elaborate office filing system ..... ⓁⓁⒾⓓⒹⒹ
158. Make sales calls on prospective clients or customers ..... ⓁⓁⒾⓓⒹⒹ

159. Manage a pet shop ..... ⓛⓛⓘⓓⓓⓓ
160. Manage the work of others ..... ⓛⓛⓘⓓⓓⓓ
161. Monitor the business expenses for an organization ..... ⓛⓛⓘⓓⓓⓓ
162. Negotiate conflicts between irate people ..... ⓛⓛⓘⓓⓓⓓ
163. Operate scientific equipment ..... ⓛⓛⓘⓓⓓⓓ
164. Organize a political campaign ..... ⓛⓛⓘⓓⓓⓓ
165. Participate in a search for an escaped criminal ..... ⓛⓛⓘⓓⓓⓓ
166. Persuade others to adopt new methods ..... ⓛⓛⓘⓓⓓⓓ
167. Plan an advertising campaign ..... ⓛⓛⓘⓓⓓⓓ
168. Plan social activities for retired people ..... ⓛⓛⓘⓓⓓⓓ
169. Plan the long-range budget of an organization ..... ⓛⓛⓘⓓⓓⓓ
170. Play the stock market ..... ⓛⓛⓘⓓⓓⓓ
171. Prepare the food for a large banquet ..... ⓛⓛⓘⓓⓓⓓ
172. Raise and care for show animals ..... ⓛⓛⓘⓓⓓⓓ
173. Raise exotic plants, such as orchids ..... ⓛⓛⓘⓓⓓⓓ
174. Repair a broken-down automobile ..... ⓛⓛⓘⓓⓓⓓ
175. Restore antique furniture ..... ⓛⓛⓘⓓⓓⓓ
176. Ride in a motorcycle race ..... ⓛⓛⓘⓓⓓⓓ
177. Run a small specialty shop in a shopping mall ..... ⓛⓛⓘⓓⓓⓓ
178. Sell expensive merchandise in an exclusive shop ..... ⓛⓛⓘⓓⓓⓓ
179. Serve as a private secretary to a top executive ..... ⓛⓛⓘⓓⓓⓓ
180. Set out new trees in a garden ..... ⓛⓛⓘⓓⓓⓓ
181. Sketch pictures for a local magazine ..... ⓛⓛⓘⓓⓓⓓ
182. Solve mathematical puzzles ..... ⓛⓛⓘⓓⓓⓓ
183. Soothe angry or upset people ..... ⓛⓛⓘⓓⓓⓓ
184. Supervise a large number of clerical workers ..... ⓛⓛⓘⓓⓓⓓ
185. Take care of small babies ..... ⓛⓛⓘⓓⓓⓓ
186. Take part in a public debate ..... ⓛⓛⓘⓓⓓⓓ
187. Tape a sprained ankle ..... ⓛⓛⓘⓓⓓⓓ
188. Teach new skills to adults ..... ⓛⓛⓘⓓⓓⓓ
189. Tell jokes to large audiences ..... ⓛⓛⓘⓓⓓⓓ
190. Tell stories to children ..... ⓛⓛⓘⓓⓓⓓ
191. Think up new products and services to sell ..... ⓛⓛⓘⓓⓓⓓ
192. Train an animal to do tricks ..... ⓛⓛⓘⓓⓓⓓ
193. Train new workers in the operation of office machines ..... ⓛⓛⓘⓓⓓⓓ
194. Travel independently in foreign countries ..... ⓛⓛⓘⓓⓓⓓ
195. Type business letters ..... ⓛⓛⓘⓓⓓⓓ
196. Work as a receptionist for a large company ..... ⓛⓛⓘⓓⓓⓓ
197. Work overseas in a foreign embassy ..... ⓛⓛⓘⓓⓓⓒ
198. Work with a young people's religious group ..... ⓛⓛⓘⓓⓓⓓ
199. Write a newspaper story ..... ⓛⓛⓘⓓⓓⓓ
200. Write a technical report ..... ⓛⓛⓘⓓⓓⓓ

Please go to the next page.

PART II—SKILLS

The major purpose of this section is to assess your skills to identify the major themes and then to compare your skills to those reported by others.

Following is a list of activities. Indicate your estimated level of skill in each by choosing one of the options provided below. If you have never done the activity, estimate how good you think you would be if you did it. Blacken the circle corresponding to your answer.

- (E) **EXPERT:** Widely recognized as excellent in this area
- (G) Good: Have well-developed skills in this area
- (sa) slightly above average: Average, or a touch above
- (sb) slightly below average: Average, or a touch below
- (P) Poor: Not very skilled in this area
- (N) **NONE:** Have no skills in this area

Sometimes these categories will seem a bit strange for the activity mentioned, but try to judge your skill level as best you can. Try to be honest and candid.

201. Acquiring the necessary resources to carry out your plans ..... (E) (G) (sa) (sb) (P) (N)

202. Acting the lead role in a demanding drama ..... (E) (G) (sa) (sb) (P) (N)

203. Activating the creative potential in other people ..... (E) (G) (sa) (sb) (P) (N)

204. Advising others on ways to promote their image as public figures ..... (E) (G) (sa) (sb) (P) (N)

205. Advising people making career decisions, helping them plan their future ..... (E) (G) (sa) (sb) (P) (N)

206. Aiding an angry husband and wife to understand each other better ..... (E) (G) (sa) (sb) (P) (N)

207. Analyzing data, using statistical concepts ..... (E) (G) (sa) (sb) (P) (N)

208. As a member of a team, inspiring your teammates to superior performance ..... (E) (G) (sa) (sb) (P) (N)

209. Being patient with children ..... (E) (G) (sa) (sb) (P) (N)

210. Being responsible for animals in a kennel or stable ..... (E) (G) (sa) (sb) (P) (N)

211. Being tough with other people when it is necessary for business purposes . (E) (G) (sa) (sb) (P) (N)

212. Building furniture, using power saws and other woodworking equipment ... (E) (G) (sa) (sb) (P) (N)

213. Caring for a wild-bird sanctuary, including preparing the proper plantings and feeding stations ..... (E) (G) (sa) (sb) (P) (N)

214. Carrying out secretarial duties, such as managing someone else's correspondence and schedule ..... (E) (G) (sa) (sb) (P) (N)

215. Charming and entertaining other people ..... (E) (G) (sa) (sb) (P) (N)

216. Coaching a highly skilled performance group, motivating them to superior achievements ..... (E) (G) (sa) (sb) (P) (N)

217. Competing against others in challenging situations ..... (E) (G) (sa) (sb) (P) (N)

218. Completing income tax returns, taking advantage of all deductions .. (E) (G) (sa) (sb) (P) (N)

219. Composing poems or essays, using a lively vocabulary and imaginative ideas ..... (E) (G) (sa) (sb) (P) (N)

220. Conducting traditional ceremonies for a social or religious group..... (E) (G) (sa) (sb) (P) (N)

221. Constructing a psychological analysis of someone, using interviews, tests, and biographical data ..... (E) (G) (sa) (sb) (P) (N)

222. Constructing outdoor projects such as decks or gazebos ..... (E) (G) (sa) (sb) (P) (N)

223. Cooking a gourmet meal, including several different courses ..... (E)(G)(Sa)(Sb)(P)(N)

224. Counseling an individual who is grappling with a personal moral dilemma, such as an unreported theft ..... (E)(G)(Sa)(Sb)(P)(N)

225. Creating a multi-media production, using multiple projectors, lights, and music ..... (E)(G)(Sa)(Sb)(P)(N)

226. Cultivating leadership talents in other people ..... (E)(G)(Sa)(Sb)(P)(N)

227. Dancing in some structured style, such as folk, ballroom, or modern dancing..... (E)(G)(Sa)(Sb)(P)(N)

228. Debating issues in a public forum .... (E)(G)(Sa)(Sb)(P)(N)

229. Defending someone in physical danger ..... (E)(G)(Sa)(Sb)(P)(N)

230. Delegating authority to others ..... (E)(G)(Sa)(Sb)(P)(N)

231. Delivering a well-organized and entertaining speech..... (E)(G)(Sa)(Sb)(P)(N)

232. Designing a laboratory experiment, setting up controls, collecting data, and applying the appropriate statistics..... (E)(G)(Sa)(Sb)(P)(N)

233. Designing jewelry, using a combination of metals and gems..... (E)(G)(Sa)(Sb)(P)(N)

234. Developing a long-range, visionary plan for your organization..... (E)(G)(Sa)(Sb)(P)(N)

235. Developing computer programs..... (E)(G)(Sa)(Sb)(P)(N)

236. Devising an arts-and-crafts project for children..... (E)(G)(Sa)(Sb)(P)(N)

237. Diagnosing the physical health of individuals, using various tests and laboratory results..... (E)(G)(Sa)(Sb)(P)(N)

238. Doing major auto repairs such as replacing piston rings or brake pads ..... (E)(G)(Sa)(Sb)(P)(N)

239. Drawing people out in conversation so that they talk freely about themselves..... (E)(G)(Sa)(Sb)(P)(N)

240. Deciding how to spend advertising dollars through various media, such as newspaper, radio, TV, or direct mail ..... (E)(G)(Sa)(Sb)(P)(N)

241. Dressing in a distinctive style, using imaginative combinations of colors and accessories..... (E)(G)(Sa)(Sb)(P)(N)

242. Editing a weekly food column for a local publication..... (E)(G)(Sa)(Sb)(P)(N)

243. Educating young people, making them feel important, helping them learn new ideas ..... (E)(G)(Sa)(Sb)(P)(N)

244. Engaging in high-risk activities, such as hang gliding, driving racing cars, or mountain climbing ..... (E)(G)(Sa)(Sb)(P)(N)

245. Establishing budgets and time schedules for your organization..... (E)(G)(Sa)(Sb)(P)(N)

246. Experimenting with new ways of preparing food ..... (E)(G)(Sa)(Sb)(P)(N)

247. Explaining scientific terms to lay people ..... (E)(G)(Sa)(Sb)(P)(N)

248. Furnishing first-aid assistance to someone badly injured..... (E)(G)(Sa)(Sb)(P)(N)

249. Giving interviews to the media, representing your organization ..... (E)(G)(Sa)(Sb)(P)(N)

250. Growing exotic plants, such as orchids or special roses ..... (E)(G)(Sa)(Sb)(P)(N)

251. Helping people plan their investment strategies..... (E)(G)(Sa)(Sb)(P)(N)

252. Helping people with their personal appearance; advising about hairstyles, clothing, and grooming ... (E)(G)(Sa)(Sb)(P)(N)

253. Identifying several major symphonies and composers by listening to musical passages ..... (E)(G)(Sa)(Sb)(P)(N)

254. In a one-on-one contest, such as tennis, racquetball, or handball, playing well enough to place in tournaments..... (E)(G)(Sa)(Sb)(P)(N)

255. Initiating new creative educational methods..... (E)(G)(Sa)(Sb)(P)(N)

Please go to the next page.

(E) **EXPERT: Widely recognized as excellent in this area**
(G) **Good: Have well-developed skills in this area**
(sa) **slightly above average: Average, or a touch above**
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(P) **Poor: Not very skilled in this area**
(N) **NONE: Have no skills in this area**

256. Installing built-in lighting, handling all of the carpentry and electrical work yourself ..... (E)(G)(sa)(sb)(P)(N)

257. Instructing new parents on the care of their infants ..... (E)(G)(sa)(sb)(P)(N)

258. Investing money for profit ..... (E)(G)(sa)(sb)(P)(N)

259. Knowing the names of the major political and historical figures in many different countries ..... (E)(G)(sa)(sb)(P)(N)

260. Landscaping a garden, including selecting the proper plants and trees . (E)(G)(sa)(sb)(P)(N)

261. Leading exercise sessions for people who want to get their bodies in better shape ..... (E)(G)(sa)(sb)(P)(N)

262. Leading other people, making important things happen ..... (E)(G)(sa)(sb)(P)(N)

263. Making the necessary political contacts so that your organization will be well-treated ..... (E)(G)(sa)(sb)(P)(N)

264. Making up stories for children, keeping the children enthralled..... (E)(G)(sa)(sb)(P)(N)

265. Managing a large forest preserve .... (E)(G)(sa)(sb)(P)(N)

266. Managing the finances of an organization, emphasizing planning and thrift ..... (E)(G)(sa)(sb)(P)(N)

267. Monitoring machines and performing the necessary maintenance to prevent future breakdowns ..... (E)(G)(sa)(sb)(P)(N)

268. Motivating others to perform in dangerous situations requiring teamwork and courage ..... (E)(G)(sa)(sb)(P)(N)

269. Negotiating compromises between conflicting parties ..... (E)(G)(sa)(sb)(P)(N)

270. Nursing sick animals back to health.. (E)(G)(sa)(sb)(P)(N)

271. Operating scientific instruments such as oscilloscopes or spectrometers... (E)(G)(sa)(sb)(P)(N)

272. Ordering correctly the necessary office supplies for next year's activities for your organization ..... (E)(G)(sa)(sb)(P)(N)

273. Organizing a political campaign..... (E)(G)(sa)(sb)(P)(N)

274. Overcoming sales resistance of potential customers ..... (E)(G)(sa)(sb)(P)(N)

275. Overseeing a production process involving people, machines, raw materials, and deadlines ..... (E)(G)(sa)(sb)(P)(N)

276. Participating in endurance sports, such as running, swimming, or bicycling ..... (E)(G)(sa)(sb)(P)(N)

277. Performing in public, playing the piano or other musical instrument ... (E)(G)(sa)(sb)(P)(N)

278. Persuading others to use your ideas or services ..... (E)(G)(sa)(sb)(P)(N)

279. Planning a marketing campaign for a new consumer product ..... (E)(G)(sa)(sb)(P)(N)

280. Playing team sports well, with ease, athletic grace, and teamsmanship ... (E)(G)(sa)(sb)(P)(N)

281. Preparing detailed financial contracts for complicated business opportunities ..... (E)(G)(sa)(sb)(P)(N)

282. Presiding as master of ceremonies at a large program ..... (E)(G)(sa)(sb)(P)(N)

283. Providing medical services to people of varying ages..... (E)(G)(sa)(sb)(P)(N)

284. Providing spiritual counseling for individuals and couples ..... (E)(G)(sa)(sb)(P)(N)

285. Purchasing clothing and accessories for department stores..... (E)(G)(sa)(sb)(P)(N)

286. Raising crops, including preparing the land, cultivating the plants, and harvesting the output ..... (E)(G)(sa)(sb)(P)(N)

287. Redecorating a large living room with the style and flair found in design magazines ..... (E)(G)(sa)(sb)(P)(N)

(E) **EXPERT:** Widely recognized as excellent in this area
(G) Good: Have well-developed skills in this area
(sa) slightly above average: Average, or a touch above
(sb) slightly below average: Average, or a touch below
(P) Poor: Not very skilled in this area
(N) **NONE:** Have no skills in this area

288. Remodeling the interior of an old building. . . . . (E) (G) (sa) (sb) (P) (N)

289. Researching a historical event, using a wide range of library and other reference materials . . . . . (E) (G) (sa) (sb) (P) (N)

290. Running a large-scale agricultural operation, such as a large farm or ranch . . . . . (E) (G) (sa) (sb) (P) (N)

291. Scanning an article or book, then using the information to support an idea or decision . . . . . (E) (G) (sa) (sb) (P) (N)

292. Scheduling the work flow in an office for maximum efficiency . . . . . (E) (G) (sa) (sb) (P) (N)

293. Searching through complex data, identifying trends, and reporting the findings in technical reports . . . . . (E) (G) (sa) (sb) (P) (N)

294. Selecting flowers and arranging floral displays . . . . . (E) (G) (sa) (sb) (P) (N)

295. Selecting paintings and sculptures for public display . . . . . (E) (G) (sa) (sb) (P) (N)

296. Selling a product or concept. . . . . (E) (G) (sa) (sb) (P) (N)

297. Serving as a host or hostess at a large dinner, making guests feel socially comfortable . . . . . (E) (G) (sa) (sb) (P) (N)

298. Serving as an officer in a national volunteer organization . . . . . (E) (G) (sa) (sb) (P) (N)

299. Setting up an efficient office filing system, including correspondence and data processing files . . . . . (E) (G) (sa) (sb) (P) (N)

300. Sketching pictures of people or objects . . . . . (E) (G) (sa) (sb) (P) (N)

301. Speaking and writing a foreign language . . . . . (E) (G) (sa) (sb) (P) (N)

302. Starting conversations with strangers . . . . . (E) (G) (sa) (sb) (P) (N)

303. Staying calm and thinking clearly in crisis situations. . . . . (E) (G) (sa) (sb) (P) (N)

304. Supervising the work of others. . . . . (E) (G) (sa) (sb) (P) (N)

305. Surviving in the wilderness, living off the land . . . . . (E) (G) (sa) (sb) (P) (N)

306. Taking people on nature walks, explaining the local plants and animals to them . . . . . (E) (G) (sa) (sb) (P) (N)

307. Teaching classes for people interested in converting to a religious faith . . . . . (E) (G) (sa) (sb) (P) (N)

308. Teaching mathematics classes . . . . . (E) (G) (sa) (sb) (P) (N)

309. Teaching new skills to adults . . . . . (E) (G) (sa) (sb) (P) (N)

310. Telling jokes to large audiences. . . . . (E) (G) (sa) (sb) (P) (N)

311. Thinking up new advertising slogans. . . . . (E) (G) (sa) (sb) (P) (N)

312. Training an animal to do tricks . . . . . (E) (G) (sa) (sb) (P) (N)

313. Translating between two people who speak different languages, such as English and French. . . . . (E) (G) (sa) (sb) (P) (N)

314. Traveling worldwide, planning your own schedule, handling your own arrangements. . . . . (E) (G) (sa) (sb) (P) (N)

315. Using algebra or geometry to solve design or construction problems . . . . (E) (G) (sa) (sb) (P) (N)

316. Utilizing outdoor equipment such as a compass, camping equipment, and climbing gear. . . . . (E) (G) (sa) (sb) (P) (N)

317. Visiting sick parishioners to provide comfort and support. . . . . (E) (G) (sa) (sb) (P) (N)

318. Working with hand tools and shop machinery . . . . . (E) (G) (sa) (sb) (P) (N)

319. Working with rifles, pistols, or other small arms . . . . . (E) (G) (sa) (sb) (P) (N)

320. Writing a newspaper story . . . . . (E) (G) (sa) (sb) (P) (N)

APPENDIX B : COVER LETTER

Dear Participant,

Thank you for agreeing to participate in my study. The information you provide by completing the enclosed questionnaire will be used to assist me in the completion of my Master's thesis. My research will attempt to determine (1) if there is a difference in career interests based solely on gender, and (2) if there is a difference in the type and strength of skills reported based solely on gender.

I would like you to fill this survey out as candidly and honestly as possible. On the first page of the survey, please fill out the spaces provided for the date, gender, race, level of education, and date of birth. Filling in your name is optional, as it will not be used for any part of this study, but you must place your name and class session on the blanks provided at the bottom of this page. This is so Dr. Utley will have a record of who participated, for extra credit purposes.

When you have completed the survey, please return it to Dr. Utley. These will be collected from Dr. Utley on Friday, 9/12/97, in the afternoon. This will allow at least one week for completion.

While completing the survey, please use #2 pencil, since this is machine scored. Thank you for your cooperation. Your participation in this study is greatly appreciated.

Sincerely,

Participant's name:_____

Anita Melton
Graduate Student
Lindenwood College

Participant's class:_____

APPENDIX C : ANOVA ON INTEREST RESULTS

One-Way ANOVA Results of Interest by Gender

Variable IINFL interest in influencing careers

By Variable SEX participant's sex

Analysis of Variance

Source	D.F.	Sum of Sq	Mean Sq	F Ratio	F Prob
Between Groups	1	860.0128	860.0128	7.9355	.0077
Within Groups	37	4009.8846	108.3753		
Total	38	4869.8974			

Variable IANALY interest in analyzing careers

By Variable SEX participant's sex

Analysis of Variance

Source	D.F.	Sum of Sq	Mean Sq	F Ratio	F Prob
Between Groups	1	233.6538	233.6538	2.6754	.1104
Within Groups	37	3231.4231	87.3358		
Total	38	3465.0769			

Variable IPROD interest in producing careers

By Variable SEX participant's sex

Analysis of Variance

Source	D.F.	Sum of Sq	Mean Sq	F Ratio	F Prob
Between Groups	1	392.6282	392.6282	3.9507	.0543
Within Groups	37	3677.1154	99.3815		
Total	38	4069.7436			

Variable	IADVEN	interest in adventuring careers
By Variable	SEX	participant's sex

Analysis of Variance

Source	D.F.	Sum of Sq	Mean Sq	F Ratio	F Prob
Between Groups	1	708.0128	708.0128	10.8455	.0022
Within Groups	37	2415.4231	65.2817		
Total	38	3123.4359			

Variable	IORG	interest in organizing careers
By Variable	SEX	participant's sex

Analysis of Variance

Source	D.F.	Sum of Sq	Mean Sq	F Ratio	F Prob
Between Groups	1	794.8846	794.8846	8.7068	.0055
Within Groups	37	3377.8846	91.2942		
Total	38	4172.7692			

Variable	IHELP	interest in helping careers
By Variable	SEX	participant's sex

Analysis of Variance

Source	D.F.	Sum of Sq	Mean Sq	F Ratio	F Prob
Between Groups	1	366.1667	366.1667	3.9916	.0531
Within Groups	37	3394.1923	91.7349		
Total	38	3760.3590			

Variable	ICREAT	interest in creating careers	
By Variable	SEX	participant's sex	

Analysis of Variance

Source	D.F.	Sum of Sq	Mean Sq	F Ratio	F Prob
Between Groups	1	203.5385	203.5385	2.3980	.13
Within Groups	37	3140.4615	84.8773		
Total	38	3344.00			

APPENDIX D : ANOVA ON ABILITY RESULTS

One-Way ANOVA Results of Ability by Gender

Variable AINFL ability in influencing careers

By Variable SEX participant's sex

Analysis of Variance

Source	D.F.	Sum of Sq	Mean Sq	F Ratio	F Prob
Between Groups	1	353.2821	353.2821	2.8866	.0977
Within Groups	37	4528.3077	122.3867		
Total	38	4881.5897			

Variable AANALY ability in influencing careers

By Variable SEX participant's sex

Analysis of Variance

Source	D.F.	Sum of Sq	Mean Sq	F Ratio	F Prob
Between Groups	1	357.5513	357.5513	3.581	.0663
Within Groups	37	3694.3462	99.8472		
Total	38	4051.8974			

Variable APROD ability in producing careers

By Variable SEX participant's sex

Analysis of Variance

Source	D.F.	Sum of Sq	Mean Sq	F Ratio	F Prob
Between Groups	1	934.6154	934.6154	14.7995	.0005
Within Groups	37	2336.6154	63.1518		
Total	38	3271.2308			

Variable AADVEN ability in adventuring careers

By Variable SEX participant's sex

Analysis of Variance

Source	D.F.	Sum of Sq	Mean Sq	F Ratio	F Prob
Between Groups	1	702.0000	702.0000	10.5513	.0025
Within Groups	37	2461.6923	66.5322		
Total	38	3163.6923			

Variable AORG ability in organizing careers

By Variable SEX participant's sex

Analysis of Variance

Source	D.F.	Sum of Sq	Mean Sq	F Ratio	F Prob
Between Groups	1	637.5513	637.5513	4.4309	.0421
Within Groups	37	5323.8846	143.8888		
Total	38	5961.4359			

Variable AHELP ability in helping careers

By Variable SEX participant's sex

Analysis of Variance

Source	D.F.	Sum of Sq	Mean Sq	F Ratio	F Prob
Between Groups	1	.3205	.3205	.0025	.9606
Within Groups	37	4787.2692	129.3857		
Total	38	4787.5897			

Variable	ACREAT	ability in creating careers			
By Variable	SEX	participant's sex			
Analysis of Variance					
Source	D.F.	Sum of Sq	Mean Sq	F Ratio	F Prob
Between Groups	1	.2051	.2051	.0028	.9582
Within Groups	37	2723.5358	73.6091		
Total	38	2723.7436			

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