CREATIVE ADOLESCENTS: SEX DIFFERENCES IN ACHIEVEMENT, INTERESTS, PERSONALITY, AND VALUES

BY

Amberlea R. Shelton

Submitted to the Department of Psychology and Research in
Education and the Faculty of the Graduate School of the University of Kansas
In partial fulfillment of the requirements for the degree of
Master of Science in Counseling Psychology.

Dr. Barbara Kerr
Chairperson

Committee members Dr. Tamara Mikinski

Dr. Kristen Bast Hensley

Date defended: May 6, 2010

The Thesis Committee for Amberlea Shelton certifies
that this is the approved Version of the following thesis:

CREATIVE ADOLESCENTS: SEX DIFFERENCES: ACHIEVEMENT, INTERESTS, PERSONALITY, AND VALUES

_____
Chairperson

Committee members _____

_____

Date approved: _____

ACKNOWLEDGMENTS

"Great talents are the most lovely and often the most dangerous fruits on the tree of humanity. They hang upon the most slender twigs that are easily snapped off."

- Carl Jung

I dedicate this work to the amazing young adults who have come through CLEOS over the past years. I am grateful to have each and every one of them in my life. They have taught me things about myself that I never expected to learn. I truly have a special place in my heart for CLEOS and all of the beautiful souls that make it such a remarkable place to work. They continue to inspire me and remind me every week why I do what I do. I owe a great deal of thanks to Dr. Barbara Kerr for not only her support in allowing me to pursue my interest in creative adolescents, but also her mentorship over the past years. She reminds all of us of our gifts and allows us a place to let them shine. Without her wisdom, generosity, and warmth, I truly would not be the person I am today. I also owe many thanks to my committee members, Dr. Tamara Mikinski and Dr. Kristin Bast Hensley for their continued advice and guidance through the Master's program. Thanks also to my husband, Scott, and mom, Kathy, who without their support, I would not be where I am today. I would also like to thank my classmates for keeping me grounded and the professors in the department who always lent an ear.

ABSTRACT

The Counseling Laboratory for the Exploration of Optimal States (CLEOS) is a research through service program that facilitates creativity, flow, and exceptional talents in adolescents. This study investigated sex differences in 549 adolescents, who have come to CLEOS, ranging in age from 13 to 18 years. The study assessed sex differences in terms of vocational interests, personality, and values; using the Vocational Preference Inventory (VPI), Personality Research Form (PRF), the Six Factor Personality Questionnaire(SFPQ), the NEO PI-R, the Tellegen Absorption Scale (TAS), and a Values Inventory. Results showed females scored significantly higher than males on grade point average; the VPI scale-Social, the PRF scales-Achievement, Endurance, Harm Avoidance, Nurturance, and Succorance; the NEO PI-R scales-Neuroticism and Openness; and the TAS score. This study found males scored significantly higher than females on the VPI scale-Realistic and the PRF scale Autonomy.

TABLE OF CONTENTS

CHAPTERS

CHAPTER 1: INTRODUCTION

Study Purpose

Career planning during high school can be easy for some people. They decide on their life purpose early on and then go for it. Each step on how to become an accountant, engineer, or teacher is clearly planned out and highlighted in their college guidebooks. Yet, what do you do if you want to become an inventor, a writer, an artist, or a musician? Creative young people who want to become an eminent person in their field have a much harder time trying to determine what path to take through school and life. Ambiguous career paths are one of the biggest challenges that creative people have to make sense of (Kerr, 2007). Some think being creatively gifted means having all the tools necessary to flourish in the educational system. What some do not realize, are the major barriers that these young people have to overcome to pursue their passions.

Highly creative individuals have been extensively studied throughout history; however, highly creative adolescents as a subgroup have been investigated less. This paper will study the sex differences among the gifted young adults who are chosen to come into the Counseling Laboratory for the Exploration of Optimal States (CLEOS) at the University of Kansas department of Psychology and Research in Education. We want to find out how we, as counselors, psychologists, teachers, and parents, can help creative female and male students accomplish prominence in school, eminence in work, and excellence in their personal life. Discovering interventions that work and understanding these creative young people on a deeper level through research will help adolescents in a way that can change our world as a whole. However, if we stop fostering ingenuity and inventiveness or refuse to offer educational resources to our creative youth, our society will suffer.

Defining Creativity

Most research on the topic of creativity does not incorporate an actual definition of what creativity is and is not. Not having a clear definition of creativity that can be used as an umbrella for the field causes contradictory research on the subject and in turn, keeps those within the field at odds due to semantics. Unfortunately, this crack in the foundation has stalled much research on the subject matter. Although the field has not yet accepted an explicit definition of creativity, this does not mean that one cannot be found. Plucker, Beghetto, and Dow (2004) proposed this definition of creativity: "Creativity is the interaction among aptitude, process, and environment by which an individual or group produces a perceptible product that is both novel and useful as defined within a social context" (p.90). Runco (2005) defines creative giftedness as "a) an exceptional level of interpretive capacity; b) the discretion to use that capacity to construct meaningful and original ideas, options, and solutions; and c) the motivation to apply, maintain, and develop the interpretive capacity and discretion" (p. 303). Creativity is frequently described in research as Big C creativity or little c creativity. Big C is indicative of eminent creativity, for example, Picasso or Beethoven, and little c is everyday creativity (Gardner, 1993). However, the amount of research done on Big C creativity and the lack thereof on little c creativity has helped to further the idea that the construct is rare (Plucker et al., 2004). Generally, definitions of creativity include the concept of novelty and originality contained by the creation.

Contemporary ideas of creativity have evolved through history. Each theory is constructed upon earlier ones, integrating past viewpoints with the addition of current research perspectives. Csikszentmihalyi (1988; 1999) takes a systems approach to creativity which underscores the interaction between an individual, the domain, and the field where creativity takes place. The individual is the artist or creator of the design. The domain, for example, could

represent something expansive, such as poetry, or could be as precise as haiku. The field is described as "gatekeepers" such as professors, editors, and evaluators; in other words, those who accept you into the field. Creativity is described as the individual changing a domain. Amabile (1982) also takes a systems approach by introducing the Consensual Assessment Technique (CAT) to determine creative production. The definition that is used by the CAT states, "a product or response is creative to the extent that appropriate observers independently agree it is creative" (p.1001). This definition suggests that anything can be seen as creative as long as it is agreed upon by a suitable group of observers or gatekeepers.

Different definitions have been assigned to creativity, giftedness, and talent in the field. For example, Feldman (1999) describes being "gifted" as a general overarching concept, whereas "talents" are described as a specific ability in a domain. This is in keeping with a major current intelligence theory, the Cattell-Horn-Carroll theory, which proposes that specific abilities are a subset of general intelligence (Flanagan & Harrison, 2005). In addition, most theories of cognition describe creativity and intelligence as overlapping (Csikszentmihalyi, 1999). The perspective I take in this paper is that giftedness, talents, and/or creativity are overlapping constructs and that most individuals identified as one share characteristics with the others.

Study Goals

Finding interventions that assist our youth in navigating through the developmental and environmental hurdles that come along with being highly creative will allow these individuals to realize and achieve their potential while adding a critical component to our society as a whole. If talents are nurtured by parents, teachers, and society, these young individuals have the potential to do brilliant things in the future for civilization. From their cohort will emerge inventors, writers, scientists, artists, and leaders who will guide America into the next decade. This study

looks to better understand differences in sex by investigating creative individuals who come through the CLEOS laboratory. The study will analyze demographic information, achievement, vocational interests, personality profiles, and values assessments to determine any significant differences between creative male and female profiles. The following review of literature will summarize the research that has been done on creative adolescent males and females, and the challenges they face as they climb the invisible career ladder.

CHAPTER 2: LITERATURE REVIEW

Creativity and Multiple Intelligences

In recent years positive psychology has shifted the emphasis in psychology from pathology to personal strengths and prevention. With its rise in popularity, attention is focused on the use of creativity as a way to improve humanity, the economy, and mental health therapy.

Lewis Terman (1916), the "father of gifted education", used the Stanford-Binet Intelligence Scale to identify creative individuals by means of IQ. According to the Stanford-Binet Intelligence Scale, any IQ score above 130 is described as giftedness (Terman, 1925). This scale is built on the notion of the "g" factor supposing that intelligence is made up of one general factor. His longitudinal study on gifted individuals found that those with an IQ of 140 or higher were physically healthier, better adjusted, and higher achievers than those of average IQ. Even today, the IQ score is still the most used assessment for placement into gifted programs, most likely due to its availability.

There are opposing views on concepts of creativity; not all researchers are convinced creativity is based on one general factor or that it has to be linked with general intelligence at all. Howard Gardner describes human intellectual aptitude as multiple intelligences, based on multiple independent cognitive classifications, rather than one general factor (Gardner, 1983, 1993, 1999). He studied eight intelligences: logical-mathematical, spatial, linguistic, musical, bodily kinesthetic, interpersonal, intrapersonal, and naturalist. There are, however, additional intelligences being studied for inclusion, such as emotional and existential intelligence. Unfortunately, not enough research has been done by Gardner and his colleagues to support his theory. (Gottfredson, 2001).

Many researchers have wondered if creativity is linked to intelligence or if the two are separate constructs. Sternberg's theory holds that intelligence cannot fully describe creativity and vice versa. Sternberg and O'Hara (1999) account for five ways that intelligence and creativity could be connected: "1) Creativity is a subset of intelligence; 2) intelligence is a subset of creativity; 3) creativity and intelligence are overlapping sets; 4) creativity and intelligence are essentially the same things; and 5) creativity and intelligence bear no relation at all to each other" (p. 251). Sternberg et al. (2002) states the connection between intelligence and creativity is usually dependent on how it is defined and measured. Guilford (1967) sees creativity as a component of intelligence and explains that creativity is the operation of "divergent thinking," or the aptitude to generate many responses. This research was taken further to create the Torrance Tests of Creativity and Thinking (TTCT) and has been used as a psychometric assessment of creativity (Torrance, 1974).

Establishing Criteria for Creative Individuals

Knowing if a student is creatively gifted depends on the individual's notion of giftedness. For instance, if the individual believes creativity is based on elevated intelligence, then the student would be selected by assessments that are based on general intelligence. Then again, if the individual's notion of creativity is based on multiple intelligences or domain-specific abilities, the student would be selected through a very different set of assessments or identification procedures. Sternberg and Lubart (1995) assert that creativity is comprised of six different fundamentals: thinking styles, intelligence, motivation, knowledge, environment, and personality. The six elements work together to produce creativity within an individual. Many students who are chosen to be in creative and gifted programs are chosen based on academic intelligence, good behavior, and how well liked they are by teachers (Kerr, 2007). This causes

problems for those creative individuals who do very well in the classes that interest them and average in other subjects, or those who are not as conforming. They may not be identified as creatively gifted.

Challenges for Creative Adolescents

Some assume being highly creative is an automatic whiz through academia and a catapult up the career ladder. Often the career ladders in creative fields are obscure, and the path to a creative career is complicated. However, many creative adolescents find themselves under pressure to make academic and career decisions. Multipotentiality, perfectionism, underachievement, and stereotype threat are some of the biggest challenges facing our creative youth.

Multipotentiality is one of the major components that many creative individuals tend to struggle with during adolescence. Multipotentiality is defined as the ability to choose and take on any number of career opportunities due to the high aptitude of the individual and an expansive assortment of interests (Frederickson, 1972). Many creative young adults realize early in life that their abilities put them in a special position of being able to do well in a number of vocations. This can cause major challenges for creative students due to their wide array of talents; individuals find it difficult to decide on an undergraduate major and career. Multipotentiality can lead students to change undergraduate majors more than the average college student or to postpone choosing a career path (Kerr & Griest-Priebe, 1988). In fact, creative males are overly apprehensive about choosing one career over another because they feel that they may make the wrong choice (Silverman, 1992). These individuals find it difficult to make decisions and find their place because it is simply not feasible to do everything they would enjoy doing.

Perfectionism is another challenge that creative individuals face, causing high levels of anxiety and decreased capacity for learning and decision making. There are two types of perfectionism. Normal perfectionism gives a boost of pleasure from the work being done while allowing the individual to be less specific in other situations. Neurotic perfectionism, on the other hand, produces a sense of never doing things suitably and not being able to feel fulfillment (Hamachek, 1978). High expectations from themselves and those around them can play a part in perfectionism, causing the inability to take risks, affirm self, let go, have fun, and get pleasure from learning (Peterson, 2007). In fact, creative males put pressure on themselves to try to win at all costs and require themselves to carry weighty responsibilities. These perfectionistic thoughts can transfer to an emotional burden.

Perfectionism in creative females looks different than it does in males; studies show girls have been found to be overly preoccupied with making mistakes, which translates into high levels of anxiety. Schuler (1997) studied middle school gifted girls and found they described perfectionism as being completely free of mistakes. The research also showed females tended to be people pleasers and worried about making errors. This is due to the goals they set for themselves, as well as the perceived goals their parents expected of them. Perfectionism can cause creative individuals to set out of touch goals for themselves, creating a paralyzing fear of anything less than an unobtainable objective.

Perfectionism can lead to unrealistic standards that sequentially can cause negative self talk, aggravation, and perceived failure (Sampson et al., 1996, 1998). Some creative teenagers find themselves in a situation where their parents want them to choose a career based on esteem rather than a career established on their own interests and values (Colangelo & Assouline, 2000). They go on to say that some parents do not want their children to somehow “waste the gift” of

creativity. Research shows that 50% of intellectually gifted individuals going to college, although given the choice of 200 majors and identified as having many interests, select majors from merely three fields: health professions, physical science, and engineering (Kerr & Colangelo, 1988). Additionally, Fredrickson (1982) stated creative multipotential students showed less variability in their choice of careers than those students who were not identified as multipotential. Parents who try to push their child into one career or another usually end up with a college student who does not get the maximum pleasure from the decision they made.

When the pendulum swings to the other side, you find underachievement as a major concern for creative female and male students. Whitmore (1986) asserts that some extraordinarily creative students too often fail to operate at their ability level. Colangelo et al. (1993) uses ability scores as a criterion for recognition of gifted underachievers, defined as "giftedness as evidenced by scores at the 95th percentile or above on the ACT; underachievement as evidenced by GPA of 2.25 or below in high school coursework." Hébert (2001) conducted a study of six talented yet underachieving males, and he recognized a number of issues that played a part in their underachievement, including: "inappropriate curricular and counseling experiences, problematic family issues, negative peer group and environmental influences, and discipline problems." Giving a list of adjectives to describe every gifted underachiever is nearly impossible due to the fact that each person is uniquely different. However, research proposes a mixture of the following could be factors in underachievement: lack of coping skills, social issues, low self-esteem about abilities, inability to set goals, lack of support from teachers and parents, inability to self-regulate, fear of failure, and anxiety (Reis & McCoach, 2000). Underachievement is psychological in nature and puts counselors in an excellent position to turn the effects around.

Stereotype threat is a challenge that creative young people face and is defined as "the experience of being in a situation where one faces judgment based on societal stereotypes about one's group" (Spencer, Steele, & Quinn, 1999). These researchers found that by being in a stereotyped group, such as African Americans, Latinos, or Women, you are more likely to perform poorly on standardized tests. This causes disparity between sexes when it comes to standardized test performance.

It is important, given the age of many of these studies, and relative dearth of research on sex differences in creative adolescents, to identify the career issues facing today's creative young women and men.

Ability versus Effort

Sex role identity is different for females than it is for males in important ways including the belief in self, social factors, emotional factors, ways in which barriers are dealt with, and socialization issues. Csikszentmihalyi, Rathunde, and Whalen (1993) conducted a study dealing with sex and giftedness that took 208 female and male intellectually artistic youth and found they were just as likely to either persist or disengage from the subject that encapsulated their talent by high school graduation. This study proposes that coincidental happenstance contributes to whether a student decides to engage in areas of talent and interest, regardless of sex. If this is true, what are the reasons young people choose to continue with their talents or disengage from them?

A student's ability to achieve or underachieve comes from having confidence or lack thereof in the self (Good and Brophy, 1986). Additionally, those who achieve tend to do so because they put in effort, and when they fall short, they blame it on a lack of effort. An examination of sex differences, in terms of achievement, found that male students who achieve

attribute doing so to ability and attribute failure to lack of effort (Hébert, 2001; 2002b), whereas, females attach effort or luck to their successes and lack of aptitude to their failures (Rimm, 1999). This handicaps women because they tend to only accept accountability for failures and leave success to luck or chance (Reis, 1998). Helping students develop a resilient feeling of confidence in their ability is paramount for both male and female students to encourage a strong belief in self.

A longitudinal study of 35 intellectually gifted females and males found those who were "high-achieving" were also confident in their aptitude and intellect (Reis, Hébert, Diaz, Maxfield, & Ratley, 1995). Moreover, these same adolescents pointed out that they did not date, had a support system within their peer group, took part in lots of activities, and were committed to their talent.

Self-Perceptions and Loss in Confidence

Both males' and females' self-perception of creativity and intelligence can be affected by parents' and teachers' approach to and comments about their abilities. Studies have shown that teachers' responses to young students' intelligence were a better predictor of self-perception about their talents than any other exchanges inside or outside the classroom (Pintrich & Blumfeld, 1985). Even subtle verbal and nonverbal messages sent to creative young people can have a lasting effect on their perception of themselves. Schunk (1984) looked at creative children who had been given positive responses to their abilities and those who were given positive responses to their effort, and discovered that those students who were reinforced for their ability had higher self-worth and gained more knowledge than the group of students who were reinforced for their effort. Furthermore, Fennema et al. (1990) found that teachers attribute talent to boys' achievements and failures, but attribute effort to girls' achievements and failures.

In fact, Sadker & Sadker (1994) summed up the research on teacher and adult perceptions on female intellect by stating, “many studies have revealed that adults misjudge the intellect of female students. In fact, girls are praised in the classroom by teachers for sitting quietly, while boys are called on three times as much and given more precise, informative responses.” This becomes a notable hardship for female students whose teachers attribute their intelligence to effort or underestimate their intelligence altogether. Reis et al. (1998) reminds us that our creative young women are at risk of judging themselves harshly and inaccurately, developing a low self-perception, and having reservations about their intelligence.

Creative females start to experience a loss of enthusiasm for learning and begin to fear speaking up in class or allowing their creativity to be seen by others. Several studies note that young creative females start to lose confidence in themselves as early as elementary school, and this was found to continue through graduate school (Cramer, 1989; Leroux, 1988; Subotnik, 1988). In fact, Kline and Short (1991) reviewed the literature and found young females’ self-perception of their talent progressively deteriorates from elementary through high school. Creative girls tend to find themselves doubting their academic capability, believing they must work harder than their peers, and perceiving their male cohorts to have intrinsic aptitude. The study indicates that creative girls tend to be exceedingly intelligent in grade school, but as they mature, their professional dreams stagnate amid feelings of uncertainty.

Another study looked at self-concept scores of 134 females, both gifted and non-gifted, in grades 3, 5, and 8. They found self-concept to deteriorate significantly between the 3rd and 5th grade, and again between 5th and 8th grade (Klein and Zehms, 1996). The creative girls in the 8th grade showed a significantly lower sense of self in the areas of behavior, intelligence, and popularity than those in the control group. For these reasons, starting intervention programs in

elementary school would be appropriate in making sure that our young female students do not lose confidence in their abilities.

Research has found creative females have a propensity to have personal and social-emotional issues that can develop at any time across the life span (Reis, 1998). These issues become apparent as causal explanations of why women do not recognize and fulfill their talents. There are many issues that contribute to creative women lacking the ability to achieve at their potential: false perceptions in ability, crediting success with luck rather than ability, confusing messages about courtesy and respect, decisions made regarding family and relationships, bad choices of romantic partners, uncertainty of teachers and parents with respect to developing high potential, decisions to nurture creativity in oneself as opposed to putting the needs of others first, hiding abilities and achievements, poor goal setting, perfectionism, as well as, personal, religious, and social issues.

Social Threats on Creativity

Highly creative children have a difficult time building friendships with those peers who are their age because they are more advanced in their development of friendship (Gross, 2004). These children have a larger vocabulary than their peers, which causes them to use words children their age do not understand. Dauber and Benbow (1990) found students with high scores in math have an easier time building relationships with children their own age than those with high verbal scores. This is probably due to the fact that an individual can hide their high abilities in math, whereas verbal intelligence is harder to conceal. Moreover, Rogers (1986) found creative students tend to obtain and process information better, more rapidly, and sooner than their peers. An additional study looked at individuals with high IQ's and discovered creative people are also differentiated by their superior memories, highly structured knowledge

base, and multifaceted processing strategies (Butterfield and Feretti, 1987). Children who advance in development earlier than their peers find it difficult to engage in friendships, and this causes them to want to hide their intelligence.

Every teenager wants to "fit in" with their peer group, sometimes at a cost to academic success. Studies have found that some creative females think being gifted creates a social hardship due to their peers' off-putting reactions towards them (Kerr, Colangelo, & Gaeth, 1988; Kerr, 1994). Callahan, Cunningham, & Plucker (1994) found gifted junior high school girls felt they needed to hide their giftedness so they would be accepted by their cohort, and Swiatek (2001) found that denial of giftedness in order to conform to the peer group was common. Gifted females want to be seen as socially competent and attractive; therefore, they intentionally undervalue their academic talent (Kramer, 1991). Intelligent young females may discount their abilities or "play dumb" to prevent peers from seeing them as deficient in social competence or as physically unappealing. Female students try to steer clear of academic competition to uphold relationships; in other words, they would rather stay socially secure than take the chance in revealing their talents. Parents also play a large role by sending messages to young females about how they should act, their politeness, how often they should speak up in public and in what circumstances, and even their choice of clothing.

Creative male students also get pressured into hiding their gifts; however, the males' reaction to the pressure looks different. Young men do not want to flaunt their intellect due to the fact that their peers may see them as nerds. Creative male adolescents realize early on in school that if they turn to athletics, they are accepted more readily into the peer group. Research has found that to avoid looking intellectually unattractive and to uphold a masculine social exterior, some creative males choose athletics over academics (Kerr & Cohn, 2001). Thompson

(2000) even goes as far as to say that all males are judged or perceived based on their athletic participation. Many creative males who do not go into athletics struggle with social issues and low self-esteem. Research has shown that young males who have a close friendship with another intelligent male, have an opportunity to avoid some of the emotional and social strife that goes on during adolescence and young adulthood (Hébert & Olenchak, 2000). These friendships serve as a buffer and an emotional support system during times of need.

One research study looked at creative young men in college who participated in the society of Greek fraternities (Hébert, 2006). The study wanted to evaluate how the students' abilities to achieve were affected by their involvement in the fraternity. The young men assessed in the study were in the top of their high school class, but focused mostly on athletics to gain peer-group acceptance. After joining the fraternities, the boys were able to be mentored by older academically gifted males in the fraternity. This led to the young men taking on leadership roles in their universities; they got involved with humanitarian campaigns, student government, and a number of other extracurricular activities. Overall, the fraternity was a place where the young men were able to cultivate their intelligence with a group of mentors who valued academic achievement.

Romantic Relationships

Holland and Eisenhart (1990) found male students get status in peer groups through actions and activities, while females are accepted by being in a relationship with a high-status male. During the period when girls are preoccupied with relationships, boys are focused on their career interests. In fact, two-thirds of the creative females in Holland and Eisenharts study had changed their career goals during college with a large number of the girls putting their love interest's dreams first. Research shows female students are affected negatively in academic

achievements when they become involved in romantic relationships (Reis et al., 1995). Moreover, females who continue in academics, marry later in life, and postpone having children come closest to achieving their aspirations (Kerr, 1994). The study goes on to say the earlier a young woman incorporates her goals with those of the ones she loves, the more likely she is to have a rewarding life.

Research comparing gifted female and male adolescents suggests that females and males have very different perceptions of career, relationships, and childrearing. One study found more than twice the proportion of males indicated specific careers they would like to be doing after graduation from college as compared to females (Reis et al., 1996). Some of the girls (25%) felt women should not work after having a baby, while 65% of the men felt the same way. Moreover, although females and males both have high occupational aspirations, males expressed expectations for their future wives to put off having a career until after they have raised the couple's children. Females, on the other hand, had very different opinions on the same subject. The majority of girls said they anticipated both partners to have a vocation and to help with childcare, while only 5% of the boys said the same. Although attitudes on the subject of men doing their half of the childrearing are shifting, many men in our culture are conditioned to believe they are the sole monetary provider and they put demands on themselves to always be number one in the domain of work (Reis & Hébert, 2008).

The womens movement not only changed stereotypes for women in the past fifty years, but has changed the conventional masculine profile as well. This has allowed men to study their vocational and emotional roles in a different way than generations have in the past. Creative males feel more comfortable choosing occupations in the arts and helping professions (Reis & Hébert, 2008). As creative females begin to choose full-time careers, creative males will feel

less of a burden to be the sole providers for their families; this will allow them to choose careers on the basis of interest rather than solely financial reasons.

How important is romantic love to today's creatively gifted young women and men? It is important to understand how they view this aspect of life.

Creative Personality

Research shows personality profiles of creative males and females have been found to be more alike than they are different (Olszewski-Kubilius, Kulieke, & Krasney, 1988). In fact, gifted girls have been found to like the same subjects and play activities as gifted boys and moreover, they look more like their gifted male counterparts than do average females (Kerr, 1994). One trait many creative individuals express is the ability to be androgynous; in other words, they do not tend to fit into "normal" sex stereotypes (Piirto, 1998). They are able to embody both female and male sex profiles into their personality. For example, Csikszentmihalyi (1996) found creative males tended to be sensitive to detail and were close with their families, whereas, females were confident and assertive. Being androgynous allows creative individuals to see the world from more than one perspective and opens an avenue for their talent to speak to all sides of the human experience.

Another trait in Mendaglio's (2007) research highlights the heightened sensitivity and emotion that creative individuals possess; experiences are felt more intensely for them. This heightened sensitivity can cause creative individuals to become self-critical and self-conscious, but it also creates a space for deep introspection and originality. It is in this space that many artistic ventures have been produced.

A longitudinal research study found creative students, when compared with average students, showed a fundamental drive towards solitude, thinking, and reading (Csikszentmihalyi,

Rathunde, & Whalen, 1993). In fact, solitude gives children time to focus their attention on their talent. Moreover, the time spent alone initiates a fruitful fantasy life evoking imagination that can be translated into the ability to solve complex problems through visualization (McCurdy, 1983). Voracious reading in a child's youth is another trait seen in most individuals who go on to have eminence in their field. Avid reading in childhood allows the individual to begin building a knowledge base that will help propel them through their studies.

Personality and motivation have been found to be the most significant components of success for creative individuals. Csikszentmihalyi states, "The unifying similarity among geniuses and innovators is not cognitive or affective but motivational. What is common among them is the unwillingness and inability to strive for goals everyone else accepts - their refusal to live by a presented life theme" (1985, p. 114). The ability to be nonconforming and exceptional allows creative individuals the freedom to listen to their intuition, to enter unconventional careers, and to close their eyes to conventional paths (Olszewski-Kubilius, 2000).

Based on the literature, the following questions will be investigated by this study. This study will investigate specific differences between males and females in achievement, interests, personality, and values. In addition, the study will investigate several broader questions, including the following:

►Will both male and female students selected show an overlap between creativity and intellectual ability?

►Will both male and female students show evidence of multipotentiality?

►Will both male and female students show evidence of potential for perfectionism?

►Will both male and female students show evidence of underachievement?

►Will both female students show evidence of stereotype threat?

►Will creative girls indicate more interest in romantic love than creative boys?

CHAPTER 3: METHOD

Data collection for CLEOS began in January of 2006 through January of 2009 and includes 549 participants. The methodology was consistent across data collection times, although additional questionnaires were added during the project, taking the place of others.

Participants

The Counseling Laboratory for the Exploration of Optimal States (CLEOS) was created by Barbara Kerr and Robyn McKay at the University of Kansas to study optimal states of consciousness. The program is the only one of its kind and provides young people with psychological counseling and career development specifically for creative adolescents. As a research-through-service program, the CLEOS project looks at creativity, flow, and exceptional talents. Selection of participants is completed using a profiling method that compares students' personality, values, and aptitude to those who are distinguished in different domains of talent. Profiling has been found to be an effective and efficient way of selecting creative adolescents who can benefit from specialized career counseling. Gifted education counselors and teachers use the creativity profile to select students whose abilities match up with at least one of the six creative personality domains: linguistics, interpersonal/intrapersonal, spatial/visual, musical, scientific/mathematical, and kinesthetic (See Appendix A).

A total of 549 students were recruited from urban and rural high schools in the Midwest to participate in CLEOS. The population was balanced evenly with respect to sex. There were 283 male (48.5%) and 266 female (51.5%) participants. Participants ranged in age from 13 to 18 years of age, with a mean (SD) age of 16.2 (1.1) years. Most participants were European American (92.7%), followed by Hispanic (4.5%), Asian American (3.6%), Native American (3.2%), African American (2.1%) and Other Race (1.6%).

Grade point averages (GPA) were reported for 350 of the participants. The mean (SD) GPA was 3.74 (0.49), with a range of 0.85 to 4.84. Composite ACT scores were reported for 112 participants. The mean (SD) composite ACT score was 27.67 (3.61), with a range of 16 to 35, placing these CLEOS Project participants whose scores were reported in approximately the ninetieth percentile nationally (ACT, 2009).

Parental and informed consent were acquired prior to participation in the study. The Ethical Principles of Psychologists and Code of Conduct (American Psychological Association, 2002) was used as a guideline for how all participants were treated throughout the study.

Measures

Students who participate in CLEOS take a battery of assessments including a demographic form, the Vocational Preference Inventory (VPI), the Six-Factor Personality Questionnaire (SFPQ), the VIA Signature Strengths Questionnaire, and the Tellegen Absorption Scale. CLEOS replaced the once used NEO PI-R and the Personality Research Form (PRF) with the SFPQ.

Demographic Form

Students complete a demographic form. Items on this form include age, sex, race/ethnicity, GPA, standardized test scores, extracurricular activities, work experience, hours worked per week, mother's and father's education level and whether or not they live at home, and favorite classes. See Appendix B for a sample demographics form.

Vocational Preference Inventory

The Vocational Preference Inventory (VPI; Holland, 1985), a revised version of the Holland Vocational Preference Inventory (HVPI; Holland, 1958), is a vocational interest test aimed at providing the user with insight into his or her vocational interests based on the people

places, and things surrounding each work environment. The VPI was administered to a subset of 407 participants. The participant gains insight into their preferred approach to work, work typology, and interest level in varying careers. The assessment is made up of 160 occupational titles divided into 11 scales. This study only looks at six scales based on Holland's six work types: Realistic, Investigative, Artistic, Social, Enterprising, and Conventional (RIASEC). The internal consistency for these scales ranges from .85 to .91, and based on a sample of bright college students, the test-retest reliability over a four-year period ranges from .48 to .61. The manual indicates participants should be of at least normal intelligence and 14 years of age or older. Participants are asked to indicate whether they are interested in or not interested in a list of 160 occupations. After completing the items, the inventory is scored and the participant is provided a Holland code which represents the types of people, places, and things that would be of most interest concerning occupation.

Personality Research Form

The Personality Research Form (PRF; Jackson, 1984) measures normal personality and includes 20 domains originally defined by Henry Murray (1938): Abasement, Achievement, Affiliation, Aggression, Autonomy, Change, Cognitive Structure, Defendence, Dominance, Endurance, Exhibition, Harm Avoidance, Impulsivity, Nurturance, Order, Play, Social Recognition, Sentience, Succorance, and Understanding. A subset of approximately 309 participants were administered the PRF. The KR20 internal consistency reliabilities for the standard scales range from .78 to .94, odd-even reliabilities range from .50 to .91, parallel form reliabilities .60 to .85, and the median reliability coefficients in all instances are in the high .80 range.

NEO PI-R

The NEO PI-R (Form S) is a 5-factor model of personality based on traits set in hierarchies from broad to narrow and from general (domain) to specific (facet). The five domains of normal personality consist of Neuroticism (N), Extraversion (E), Openness to Experience (O), Agreeableness (A), and Conscientiousness (C). The NEO PI-R was administered to a subset of 168 participants. Individuals respond using a 5-point Likert scale ranging from "strongly disagree" to "strongly agree." This 240-item assessment has coefficient alphas of .92 (N), .89 (E), .87 (O), .86 (A), and .90 (C). The specific facet scale has eight items and an internal consistency that varies between .56 and .81 in self-reports. The domain scale consists of 48 items and varies between .86 and .95. A six-year longitudinal study of N, E, and O scales showed stability coefficients ranging from .68 to .83 in self-report. The Openness scale on the NEO measures active imagination, preference for variety, intellectual curiosity, aesthetic sensitivity, attentiveness to inner feelings, and independence of judgment; these have been linked to creativity in individuals (Costa & McCrae, 1992).

Six Factor Personality Inventory

The Six Factor Personality Inventory (SFPQ) measures personality using six different factor scales: Extraversion, Agreeableness, Independence, Openness to Experience, Methodicalness, and Industriousness. These personality traits represent an expansion of the "Big Five" traits represented in the NEO PI-R. A subset of approximately 235 participants were administered the SFPQ. The SFPQ is a 160-item self-report questionnaire designed to measure personality. The SFPQ measures the degree to which respondents endorse each question using a 5-point Likert scale ranging from "strongly disagree" to "strongly agree." The normative sample (n=1067) consists of 584 women and 483 men from Canada and the United States. Internal consistency reliability established from the normative sample resulted in Cronbach's alpha for

the facet subscales ranging from .54 to .84, with a median of .65. Reliability estimation for the factor scales was from .76 to .86, with a median of 81. Convergent and discriminate validity was investigated by using a multitrait-multimethod matrix of correlations between peer and self-ratings. This produced a validity coefficient of .56. The authors of the SFPQ reinforce construct validity by describing other research studies that offer support of validity.

Tellegen Absorption Scale

The Tellegen Absorption Scale (TAS) consists of 34 true-false items such as: "It is sometimes possible for me to be completely immersed in nature or in art and to feel as if my whole state of consciousness is being altered" and "My thoughts often don't occur as words but as visual images" (Tellegen, 1982). The TAS was administered to a subset of 544 participants. The coefficient alpha, based on the KR-20 simplification, for the TAS is .86 and has high test–retest reliability. The TAS is thought to measure hypnotic susceptibility and draws on parts of life that are not commonly felt or experienced in everyday societal life. Tellegen defines absorption as a state of "total attention" during which there is a total dedication to experiencing or modeling the attentional object, whether it be a landscape, human being, or remembered incident. However, he revised his definition of absorption adding that absorption does not prevent other attentional processes from occurring at the same time.

Rokeach Values Inventory

The Rokeach Values Inventory is a 20-item self-report questionnaire designed to measure character values. The instrument includes 20 values consisting of: Admiration of Others, Beautiful World, Exciting Life, Harmony with Nature, Equality, Family Security, Freedom, Health, Inner Harmony, Mature Love, National Security, Pleasure and Leisure, Prosperous Life, Sense of Accomplishment, Spirituality, Self Respect, Service to Others, True Friendship,

Wisdom, and a World at Peace. Respondents rank the values in importance from 1, very important, to 20, least important. Little empirical research has been conducted on the psychometric properties of the scale.

Procedures

After the students have been profiled and selected, they spend a day in our career guidance laboratory where they take a series of assessments over vocational interests, personality, and values. Assessments were taken in the computer lab at the University of Kansas, School of Education. CLEOS lab assistants were available to offer direction and answer questions during the assessment process. After the assessments are completed, the students engage in a small group discussion over flow consciousness, which has been associated with the creative personality (Csikszentmihalyi, 1996). The students also have a one-on-one mentoring session with a counseling psychology master's or doctoral student. During the individual mentoring session, counselors interpret the assessments the students took earlier that day and give encouragement and information about the career paths that will lead to the students' goals. After the mentoring session, students take part in a Future Perfect Day visualization that allows them to fantasize about a perfect working day ten years into their own future (Kerr, Kurpis & Harkins, 2005). The future perfect day visualization and the flow discussion teach creative young people to develop accurate intuition and to explore activities that induce flow states. Lastly, the students participate in another small group where they are educated on the characteristics and challenges of being creative and given tools that they can use to help them succeed. Students who participate in the CLEOS lab increase their engagement in career exploration, their knowledge about career ladders for creative people, and their hope for the future.

Aims

The aim of this paper is to assess sex differences within a highly creative adolescent population by studying demographic information, vocational preferences, personality, and values, and link these findings to the literature of sex and creativity. This is important because it seeks to clarify characteristics of female and male creative adolescents. Moreover, it gives counselors knowledge about what works best in terms of sex for career guidance and psychological counseling.

Evaluating Demographics

►Hypothesis 1a: There will be no differences between males and females in grade point average.

►Hypothesis 1b: There will be no differences between males and females on ACT scores.

Assessing Vocational Interests

►Hypothesis 2: There will be no differences between males and females on Vocational Preferences.

Reviewing Personality

►Hypothesis 3a: There will be no differences between males and females in personality measured by the Personality Research Form.

► Hypothesis 3b: There will be no differences between males and females in personality measured by the NEO PI-R.

►Hypothesis 3c: There will be no differences between males and females in personality measured by the Six Factor Personality Questionnaire.

►Hypothesis 3c: There will be no differences between males and females in absorption measured by the Tellegen Absorption Scale.

Regarding Values

►Hypothesis 4a: There will be no differences between males and females in values measured by the Rokeach Values Scale.

Regarding Multipotentiality, Perfectionism, and Romantic Relationships

►Hypothesis 5a: There will be no evidence of perfectionism in males or females.

►Hypothesis 5b: There will be no evidence of stereotype threat in females.

►Hypothesis 5c: There will be no evidence of romantic relationships in females.

CHAPTER 4: RESULTS

This section is organized by presenting results in the following order: demographic information, vocational interests, personality, and values, and then results pertaining to the broad questions of creativity and intellect, stereotype threat, and perfectionism. The Bonferroni correction, a method used to address the dilemma of having multiple comparisons, will be used to deal with the large number of statistical analyses. Each individual hypothesis will be tested at a statistical significance level of .05/*n* (.05/65 = 0.0008) times what it would be if only one hypothesis were tested. Variations of the sample *n* vary between assessments due to the assessments being altered throughout the CLEOS project timeline. The first cohort took the Rokeach Values Inventory, the VPI, the NEO PI-R, the TAS, and the PRF. The second cohort took the Rokeach Values Inventory, the VPI, the NEO PI-R, and the TAS. The third cohort took the Rokeach Values Inventory, the SFPQ, and the TAS.

Demographic Information

Note the sample *n* varies, due to missing demographic data in a few participant cases. Table 1 presents the means and standard deviations of high school GPAs and ACT scores by sex. The means and standard deviations of high school GPAs were relatively similar for females and males. However, on the average, women had a higher high school GPAs than males did.

Table 1
Means and Standard Deviations for High School GPA and ACT Scores by Sex

	Males		Females	
	M	*SD*	*M*	*SD*
High School GPA	3.64	.45	3.84	.50
ACT Composite	27.80	3.94	27.51	3.19
ACT Math Scores	27.77	4.39	25.33	4.79
ACT English Scores	27.00	3.08	28.39	4.21
ACT Reading Scores	27.58	4.54	28.27	3.97
ACT Science Scores	27.65	5.43	25.27	3.75

An independent *t* test was conducted to evaluate sex differences in grade point average. The test did show significant results, $t(4) = 348$, $p = .0000787$ with females having higher grade point averages. The 95% confidence interval for the difference in means ranged from .10 to .30. The eta square index indicated that 4% of the variance of the GPA was accounted for by whether a student was male or female. The null hypothesis was rejected.

A one-way analysis of variance was conducted to evaluate the relationship between sex and ACT scores; the composite ACT scores will be assessed first followed by specific subject areas of Math, English, Reading, and Science. The independent variable included two levels, females and males. The dependent variable was ACT scores. The ANOVA did not show significant results as a function of the independent variable with ACT composite scores, $F(1, 110) = .18$, $p = .67$, partial $\eta^2 = .00$, ACT English scores, $F(1,57) = 2.00$, $p = .16$, partial $\eta^2 = .03$, ACT Reading scores, $F(1,57) = .39$, $p = .53$, partial $\eta^2 = .01$, and ACT Science scores, $F(1, 57) = 4.00$, $p = .05$, partial $\eta^2 = .07$. The results of the one-way ANOVA supported the hypothesis that sex had no differential effects on ACT scores.

Vocational Interests

VPI. Table 2 presents the means and standard deviations of the VPI scales by sex. The six scales are based on Holland's six work types Realistic, Investigative, Artistic, Social, Enterprising, and Conventional (RIASEC).

Table 2
Means and Standard Deviations for VPI Scales by Sex

	Females		Males	
	M	*SD*	*M*	*SD*
Realistic	2.00	2.45	4.10	3.44
Investigative	5.32	4.04	5.38	4.07
Artistic	7.39	4.13	6.06	4.45
Social	5.16	3.53	3.21	3.04
Enterprising	3.40	3.32	3.03	3.12
Conventional	1.24	1.86	1.57	2.52

An independent *t* test was conducted to evaluate the differences in creative male and creative female adolescents on the VPI. The test did show significant results for R, $t(405) = -7.04$, $p = .00001$. The 95% confidence interval for the difference in means ranged from -2.68 to -1.51. The eta square index indicated that 11% of the variance of the VPI Realistic was accounted for by whether a student was male or female. The test did not show significant results for I, $t(405) = -.152$, $p = .88$. The 95% confidence interval for the difference in means ranged from -.85 to .73. The test did not show significant results for A, $t(405) = 3.12$, $p = .002$. The 95% confidence interval for the difference in means ranged from .43 to .49. The strength of the relationship between sex and VPI Artistic, as assessed by η^2, was small, with sex accounting for 2% of the variance of the dependent variable. The test did show significant results for S, $t(405) = 6.04$, $p = .00001$. The 95% confidence interval for the difference in means ranged from .33 to 1.32. The strength of relationship between sex and VPI Social, as assessed by η^2, was medium, with sex accounting for 8% of the variance of the dependent variable. The test did not show significant results for E, $t(405) = 1.15$, $p = .25$, and C, $t(405) = 1.15$, $p = .25$. The results of the test rejected the null hypothesis that female sex is statistically significant on the VPI scale Social, while, male sex is statistically significant on the VPI scale Realistic.

Personality

PRF. The Personality Research Form measures normal personality and includes 20 domains: Abasement, Achievement, Affiliation, Aggression, Autonomy, Change, Cognitive Structure, Defendence, Dominance, Endurance, Exhibition, Harm Avoidance, Impulsivity, Nurturance, Order, Play, Social Recognition, Sentience, Succorance, and Understanding. Table 3 presents the means and standard deviations of the PRF scales by sex.

Table 3
Means and Standard Deviations for PRF Scales by Sex

	Females		Males	
	M	*SD*	*M*	*SD*
Abasement	7.57	2.73	6.61	2.61
Achievement	10.85	3.29	8.87	3.60
Affiliation	10.60	3.65	10.08	3.58
Aggression	7.67	3.67	8.70	3.31
Autonomy	7.15	3.76	8.96	3.58
Change	9.27	3.22	8.79	3.25
Cognitive Structure	7.68	3.51	6.59	3.12
Defendence	6.88	3.44	7.36	3.81
Dominance	9.15	4.17	9.76	3.89
Endurance	10.87	3.26	9.50	3.63
Exhibition	8.99	4.29	9.03	4.47
Harm Avoidance	7.93	4.18	5.79	4.06
Impulsiveness	8.01	3.94	8.52	4.31
Nurturance	11.42	3.00	8.72	3.12
Order	5.65	4.26	4.23	3.60
Play	10.67	3.28	11.69	3.09
Sentience	10.57	2.61	9.58	3.18
Social Recognition	8.77	3.51	8.14	3.71
Succorance	7.98	3.77	6.18	3.74
Understanding	9.87	3.55	9.00	3.55

A one-way analysis of variance was conducted to evaluate the relationship between sex and PRF scales. The independent variable included two levels, females and males. The dependent variable was scales of the PRF. The ANOVA did show significant results for the scales: Achievement, $F(1, 307) = 25.15$, $p = .00001$, partial $\eta^2 = .08$, Autonomy, $F(1, 307) = 18.61$, $p = .00001$, partial $\eta^2 = .06$, Endurance, $F(1, 307) = 25.15$, $p = .0005$, partial $\eta^2 = .04$,

Harm Avoidance, $F(1, 307) = 20.84$, $p = .00001$, partial $\eta^2 = .06$, Nurturance, $F(1, 307) = 60.04$, $p = .00001$, partial $\eta^2 = .16$, Succorance, $F(1, 307) = 17.70$, $p = .00003$, partial $\eta^2 = .06$, and as a function of the independent variable of sex. The ANOVA did not show significant results as a function of the independent variable for the scales: Abasement, $F(1, 307) = 9.94$, $p = .01$, partial $\eta^2 = .03$, Affiliation, $F(1, 307) = 1.59$, $p = .21$, partial $\eta^2 = .01$, Aggression, $F(1, 307) = 6.83$, $p = .01$, partial $\eta^2 = .02$, Change, $F(1, 307) = 1.66$, $p = .20$, partial $\eta^2 = .01$, Cognitive Structure, $F(1, 307) = 8.32$, $p = .01$, partial $\eta^2 = .03$, Defendence, $F(1, 307) = 1.34$, $p = .24$, partial $\eta^2 = .00$, Dominance, $F(1, 307) = 1.76$, $p = .19$, partial $\eta^2 = .01$, Exhibition, $F(1, 307) = .01$, $p = .94$, partial $\eta^2 = .00$, Impulsiveness, $F(1, 307) = 1.17$, $p = .28$, partial $\eta^2 = .00$, Order, $F(1, 307) = 10.08$, $p = .01$, partial $\eta^2 = .03$, Play, $F(1, 307) = 8.00$, $p = .01$, partial $\eta^2 = .08$, Sentience, $F(1, 307) = 8.84$, $p = .01$, partial $\eta^2 = .03$, Social Recognition, $F(1, 307) = 2.39$, $p = .12$, partial $\eta^2 = .01$, and Understanding $F(1, 307) = 4.67$, $p = .03$, partial $\eta^2 = .02$, as a function of the independent variable of sex. The results of the test rejected the null hypothesis that male sex scored statistically significant on the PRF scale, Autonomy, while female sex scored statistically significant on the PRF scales, Achievement, Endurance, Harm Avoidance, Nurturance, and Succorance. The strength of the relationship between sex and PRF scale Nurturance, as assessed by η^2, was strong, with sex accounting for 16% of the variance of the dependent variable. The PRF scales Achievement, Autonomy, Harm Avoidance, and Succorance was of medium strength, as assessed by η^2. The PRF scale Endurance had a small effect size, as assessed by η^2. There was no difference in the average score of females and males on the PRF scales Abasement, Affiliation, Aggression, Change, Cognitive Structure, Defendence, Dominance, Exhibition, Impulsivity, Order, Play, Sentience, Social Recognition, and Understanding.

NEO PI-R. The five domains of normal personality consist of Neuroticism (N), Extraversion (E), Openness to Experience (O), Agreeableness (A), and Conscientiousness (C). Table 4 presents the means and standard deviations of the NEO PI-R scales by sex.

Table 4
Means and Standard Deviations for NEO PI-R Scales by Sex

	Females		Males	
	M	*SD*	*M*	*SD*
Neuroticism	99.35	22.44	86.59	18.00
Extraversion	124.36	19.48	114.88	17.08
Agreeableness	116.13	20.31	105.64	23.70
Conscientiousness	106.64	23.48	96.65	21.41
Openness to Experience	134.39	19.56	123.21	21.71

An independent *t* test was conducted to evaluate the hypothesis that creative female adolescents will score statistically differently than creative male adolescents on the NEO PI-R personality scales. The test did show significant results for Neuroticism, $t(166) = 4.07$, $p = .00007$. The 95% confidence interval for the difference in means ranged from 6.57 to 18.95. The eta square index indicated that 9% of the variance of the Neuroticism was accounted for by whether a student was male or female. The test did not show significant results for Extraversion, $t(166) = 3.36$, $p = .0009$. The 95% confidence interval for the difference in means ranged from 3.90 to 15.06. The strength of the relationship between sex and Extraversion, as assessed by η^2, was medium, with sex accounting for 6% of the variance of the dependent variable. The test did not show significant results for Agreeableness, $t(166) = 3.08$, $p = .002$. The 95% confidence interval for the difference in means ranged from 3.77 to 17.23. The eta square index indicated that 5% of the variance of the Agreeableness was accounted for by whether a student was male or female. The test did not show significant results for Conscientiousness, $t(166) = 2.88$, $p = .004$. The 95% confidence interval for the difference in means ranged from 3.15 to 16.83. The

eta square index indicated that 5% of the variance of the Conscientiousness was accounted for by whether a student was male or female. The test did show significant results for Openness, $t(166) = 3.50$, $p = .0005$. The 95% confidence interval for the difference in means ranged from 4.87 to 17.47. The strength of the relationship between sex and Openness, as assessed by η^2, was medium, with sex accounting for 7% of the variance of the dependent variable. The results of the NEO PI-R rejected the null hypothesis that females scored significantly higher than males on the scales Neuroticism and Openness to Experience.

SFPQ. The Six Factor Personality Inventory (SFPQ) measures personality using six different factor scales: Extraversion, Agreeableness, Independence, Openness to Experience, Methodicalness, and Industriousness. Table 4 presents the means and standard deviations of the SFPQ scales by sex.

Table 5
Means and Standard Deviations for SFPQ Scales by Sex

	Females		Males	
	M	*SD*	*M*	*SD*
Extraversion	65.42	10.37	63.25	11.88
Independence	50.74	9.42	54.38	9.82
Agreeableness	50.98	9.54	50.42	9.61
Openness to Experience	61.46	9.88	58.38	9.61
Methodicalness	53.41	11.67	53.09	10.45
Industriousness	57.79	9.30	54.86	8.91
Conscientiousness	55.86	8.92	54.23	8.45

A one-way analysis of variance was conducted to evaluate the relationship between sex and the SFPQ scales. The independent variable included two levels, females and males. The dependent variable was the SFPQ scores. The ANOVA did not show significant results as a function of the independent variable with Extraversion, $F(1, 233) = 2.19$, $p = .14$, partial $\eta^2 = .01$, Independence, $F(1, 233) = 8.36$, $p = .004$, partial $\eta^2 = .04$, Agreeableness, $F(1, 233) = .20$, p

= .65, partial η^2 = .00, Openness to Experience, F(1, 233) = 5.88, p = .02, partial η^2 = .03, Methodicalness, F(1, 233) = .05, p = .82, partial η^2 = .00, Industriousness, F(1, 233) = 6.07, p = .014, partial η^2 = .03, and Conscientiousness, F(1, 233) = 2.07, p = .15, partial η^2 = .01. The results of the one-way ANOVA supported the hypothesis that sex had no differential effects on NEO PI-R scales.

TAS. The TAS is thought to measure hypnotic susceptibility and draws on parts of life that are not commonly felt or experienced in everyday societal life. A one-way analysis of variance was conducted to evaluate sex differences in Tellegen score. The independent variable included two levels, females and males. The dependent variable was the TAS score. For the set of 266 TAS scores, the standard deviation is 17.96 for females with a mean of 64.95, and 20.79 for males with a mean of 58.30. The ANOVA did show significant results for TAS scores, F(1, 542) = 15.88, p = .00008. The strength of the relationship between sex and TAS scores, as assessed by η^2, was small, with sex accounting for 3% of the variance of the dependent variable. The results of the one-way ANOVA rejected the null hypothesis that sex differences do not exist on the TAS overall scale.

Rokeach Values Inventory. The instrument includes 20 values consisting of: Admiration of Others, Beautiful World, Exciting Life, Harmony with Nature, Equality, Family Security, Freedom, Health, Inner Harmony, Mature Love, National Security, Pleasure and Leisure, Prosperous Life, Sense of Accomplishment, Spirituality, Self Respect, Service to Others, True Friendship, Wisdom, and a World at Peace. Table 6 presents the means and standard deviations of the Values Inventory by sex.

Table 6
Means and Standard Deviations for Values Inventory Scales by Sex

	Females			Males		
	N	*M*	*SD*	*N*	*M*	*SD*
Accomplishments	138	11.28	5.32	145	11.48	5.30
Admiration of Others	133	7.05	5.61	142	8.43	5.57
Beauty	130	8.86	5.22	142	9.18	5.38
Equality	135	11.10	4.98	141	10.96	5.10
Exciting Life	135	10.30	6.05	146	11.61	6.39
Family Security	136	11.20	5.48	137	10.13	5.33
Freedom	136	12.46	4.81	143	13.16	5.07
Friendship	145	14.47	4.97	149	13.46	4.66
Harmony with Nature	135	8.74	6.00	147	8.10	5.57
Health	138	11.49	4.28	145	11.19	4.90
Inner Harmony	135	11.43	5.58	141	11.53	5.38
Mature Love	141	13.38	5.48	144	11.88	5.35
National Security	132	6.02	5.73	141	6.38	5.67
Peace	134	10.82	5.70	142	10.91	5.98
Pleasure	137	8.92	5.13	146	10.02	5.50
Prosperous Life	136	9.57	5.80	145	11.89	6.01
Self Respect	140	13.27	5.22	142	12.33	4.71
Service to Others	134	9.90	5.32	148	8.29	5.54
Spirituality	135	11.50	6.97	147	9.84	7.20
Wisdom	141	13.69	4.51	147	13.63	5.23

A one-way analysis of variance was conducted to evaluate the relationship between sex and the Values Inventory. The independent variable included two levels, females and males. The dependent variable was the Values Inventory scales. The ANOVA did not show significant results for the Rokeach Values. The results of the one-way ANOVA supported the hypothesis that sex differences do not exist on the Rokeach Values Inventory scales.

Broad Questions

►Evidence for overlap of creativity and ability: There is evidence that these students were both highly able and creative, with both GPA and ACT mean scores above the 90th percentile for the state. The GPA was high for males and females, as were ACT scores, which illustrates ability.

High Openness to Experience scores and Tellegen Absorptions scores indicate high creativity. Creativity is also denoted with the top VPI scale being Artistic followed by Investigative.

►Evidence for perfectionism: There is evidence that female students may have issues with perfectionism due to their high scores on Achievement, Endurance, Harm Avoidance, Succorance, and Neuroticism. However, males tended not score high on these scales to be a perfectionistic group.

►Evidence for underachievement: There is evidence of underachievement in the large range of GPAs. Despite the overall high mean GPA, there was a great range, indicating a high number of students at the bottom end of the GPA scale.

►Evidence for stereotype threat: There is evidence of stereotype threat for females. Females scored significantly higher on GPA, while scoring lower on ACT subject tests Math and Science and the ACT Composite score.

►Evidence for creative females to indicate more interest in romantic love than creative males: There is some evidence for females to indicate more interest in romantic love than creative males. Females' high values in Succorance, Nurturance, and Harm Avoidance as well as low scores on Independence could cause females to reach for romantic relationships to attend to those needs. Although the Rokeach Value of Mature Love was not significantly higher for females, it was their third most chosen value with Friendship coming in first, whereas males selected Mature Love as their sixth most chosen value.

CHAPTER 5: DISCUSSION, LIMITATIONS, AND RECOMMENDATIONS

Discussion

The main goal of this study was to identify similarities and differences in young creative female and male adolescents so future counselors can use this knowledge to implement better interventions in practice.

This study showed that although females have significantly higher GPAs than males in their cohort, they scored lower on the ACT Math and Science subject tests, as well as the ACT composite score. This may be an example of effects of stereotype threat, described earlier in the study, which can cause females to perform poorly on standardized tests. In fact, Wainer and Steinberg (1992) also found that in a group of females and males who made equivalent grades in a college math class, males scored 33 points higher than females on the SAT-Math section. This is harmful for highly creative female students because standardized test scores usually determine what universities they decide to apply to. Lower standardized test scores could prevent creative female students from applying to prestigious universities not solely due to the scores, but also their faculty's lowered confidence in their abilities**,** as Sadker and Sadker (1994) pointed out.

Another aim of this study was to find out how vocational interests differ between highly creative female and male adolescents. In our study, females endorsed more vocational interests having to do with the Social VPI scale, while males endorsed Realistic interests. The study found both males and females in the study had Artistic followed by Investigative as their highest vocational interest scales. The main difference arises with the third ranking vocational interest scale, which for females is Social and for males is Realistic. The Social and Realistic interest scales are diagonal from each other on Holland's Hexagon, meaning that the two constructs are least like each other.

As time marches forward, males and females may be becoming more androgynous. However, there are certain traits that are so engrained in us that they will take longer to fade away. This is one reason our highly creative youth are different in their personalities, vocational interests, and values. The major difference in the vocational interest scale is male's endorsement of Realistic, while females endorse Social. When you study these two interest scales you could see a strong pattern. For example, the definition for Realistic uses descriptions such as rugged, practical, and physically strong; having good physical skills; and likely to work outdoors and with tools. Furthermore, the Social interest definition uses wording such as humanistic, and concerned for the welfare of others; they have very little interest in situations requiring physical exertion or working with machinery. The difference in male and female scores on Realistic and Social could be attributed to culture's support of long-standing sex roles. Further research would be needed to burrow deeper into this topic.

Another objective of the study was to assess the personalities of highly creative youth by looking at the PRF, NEO PI-R, and the SFPQ. The top five personality scales females endorsed on the PRF were Nurturance, Endurance, Achievement, Play, and Affiliation. The top five personality scales males endorsed on the PRF were Play, Affiliation, Dominance, Sentience, and Endurance. Both sexes have Play, Affiliation, and Endurance as their top scales on the PRF. Play is described by Jackson and Murray as, "doing things just for fun, jokes and tells funny stories, merry, and playful;" while Affiliation is "enjoying being with people, wins friendships, and is sociable." These two constructs are similar to the Extraversion scale on the NEO PI-R that both sexes chose as their second highest personality scale on that assessment and their most endorsed scale on the SFPQ. Extraversion is described as "sociable, persuasive, expressive, and entertaining." Endurance was another scale that both sexes have in their top five, and this is

described as “a person who is willing to work long hours to accomplish tasks, persevering, and persistent.” This is one of the personality traits that got these individuals into gifted programs and CLEOS. The unusual combination of playfulness and endurance seems, according to the literature, to be at the heart of the creative personality.

Sex differences in the highly creative individuals at CLEOS confirmed what has been found in previous studies of creative males and females, as well as producing new information. Unlike males, females have Nurturance and Achievement as two of the top five personality traits on the PRF. In fact, the strength of the relationship between sex and Nurturance, as assessed by η^2, was the strongest effect size in this study, with sex accounting for 16% of the variance of the dependent variable. As defined by the PRF, Nurturance is “likes to give comfort and help to others, sympathetic, supportive, caring, and does favors.” In the past, Nurturance was primarily seen as a female trait. Achievement is defined as “wants to accomplish difficult tasks, works hard to achieve, likes competition, and industrious.” On the other hand, males have Dominance and Sentience as two of the personality traits in the top five on the PRF. Dominance is defined as “liking to be in charge, strong leadership qualities, persuasive, and influential.” The definition of Sentience is “likes to use senses, notices environment and its importance, and enjoys physical sensation.” Additionally, male students scored higher on Aggression. Where Aggression is defined as, “enjoys arguing; easily angered, hot-tempered, quarrelsome; pushy; and fights to get own way.”

Socialization of Creative Individuals

Another way that the individuals in our study look different is through the possible effects of sex role socialization on character. Social effects are shown in Realistic interests by characterizing men as having trouble expressing themselves or in communicating their feelings

to others, and preferring to deal with things rather than with ideas or people. Females are characterized by Social interests as having the ability to express themselves well and get along well with others; preferring to solve problems by discussing them with others, or by arranging or rearranging relationships between others. This is an example of the ways society teaches men and women to behave. When females express their feelings and talk about problems, it is seen as socially acceptable, but males, on the contrary, are not as socially able to express feelings and emotions as readily as females.

The SFPQ draws from the big five personality scales. The top three scales for both sexes in this study were Extraversion, Openness to Experience, and Industriousness. They differed on the Independence scale. Males scored it their fourth highest scale. Females scored it their seventh and lowest scale. The definition of high Independence for the SFPQ is "self-determined and shows a high level of autonomy, enjoys being free in various situations, and is unconcerned about reputation or others' praise or disapproval." Low Independence is "the willingness to follow established rules and guidelines, feels it is important to obtain guidance and support from others around them, feels that a good reputation and social image is important to maintain." This difference between sexes could be explained by females being more socially inclined than males. You also see this in the VPI scales where females endorse Social and males endorse Realistic. Society's effect on sex role can also be seen in the SFPQ's Independence scale on which women scored lower than men. This observation is in agreement with earlier discussion about how females are taught to follow rules and be quiet, and males to challenge themselves and speak up. Since creativity requires independence, females need encouragement to develop a resilient feeling of self-reliance in their ability.

A final purpose of the study was to evaluate character values within creative youth. This study found males tended to endorse scales such as Friendship and Prosperous Life, while females endorsed Mature Love, Wisdom, and Self Respect.

Society's effects also show up in the students' chosen character values. For example, women choose Mature Love and Service to Others as top values, an observation known as the Cinderella Effect. This effect is seen in females who base their self-worth on the man they marry. During adolescence, girls are rewarded for their appearance and social life instead of academic achievements. This teaches them to change their priorities from academics to relationships. Another example of the social effects on females is the culture of romance described earlier in the study. The culture of romance is a study that found men achieve status in their cohort through accomplishments while women achieve status through relationships with high-status men. Unlike females, men chose Prosperous Life as a top value. Society teaches men they are the sole monetary provider; consequently, they put demands on themselves to always be number one in the domain of work.

Although females had higher scores on all of the NEO PI-R scales, both sexes' top score was Openness to Experience, followed by Extraversion, Agreeableness, Conscientiousness, and Neuroticism. Research has found creative personalities exhibit a heightened Openness to Experience, which is defined as "imaginative daydreaming, awareness and appreciation of emotional responses, artistic sensitivity, willingness to try new activities, intellectual curiosity, and a flexible approach to moral and social values" (Costa & McCrae, 1992). McCrae (1987) states that openness is associated with having an adaptable cognition when approaching problems and not attaching them to any one viewpoint. Some of the more recent studies have only strengthened the findings on openness and artistic interests. Feist (1998) found that

openness is the ability to imagine how things would look if they were changed and not just how they appear. He also states individuals with a heightened Openness to Experience are able to have a wide assortment of feelings, thoughts, and problem solving tactics. This allows them to experience imaginative ideas and become open to many different ideas, individuals, and circumstances.

Limitations

The data sample was limited in racial and ethnic diversity, although the sample reflects the makeup of the adolescent population of a Midwestern plains state. Therefore, the data is more applicable to adolescent students living in the Midwest. The generalizability of results is limited due to the lack of, or small representation of, ethnic groups. The study needs to be extended to reach urban students and individuals who represent a wide variety of racial and ethnic backgrounds. The creative students were selected by gifted coordinators, counselors, and teachers. These two factors reduce the external validity of the findings. Participants completed the assessments in a relatively lengthy period of time (2.5 hours); therefore, fatigue may have been an issue in the accuracy of the assessments. It is recommended in the future that students take the assessments before they come to CLEOS so they can complete them at their own leisure; this will also allow extra time during the CLEOS day to add meaningful interventions.

Recommendations

There has been little research carried out to determine ways in which counselors can assist highly creative female and male individuals to accomplish great success in their school, work, and personal lives. One reason for this could be that studying creativity is no small task, and Sternberg and Lubart (1999) agree. They stated some roadblocks to studying creativity: creativity's mystic and spiritual beginning, the notion that the analysis of creativity is based on

commercialism rather than research, the fact that early studies on creativity were not conducted within conventional psychology, there are no solid definitions of creativity, and the viewpoint that creativity is an uncommon occurrence. Because creativity can be an unclear construct, future research needs to be done; especially on interventions that work and having a clear, agreed upon definition of creativity.

This study was made up of mostly middle class, adolescent high school students. It is important to broaden the sample to include disadvantaged highly creative youth. Disadvantaged youth may not have the resources necessary to engage in creative programs like CLEOS. It would be useful to investigate the reasons underprivileged youth succeed or do not succeed, and what programs can do to better assist their needs.

Longitudinal studies on the students who come through CLEOS would be advantageous. This would allow researchers to determine what successes these creative young people create for themselves as adults. It would also teach us more about goals obtained throughout undergraduate and graduate studies, as well as those obtained in the careers of these creative individuals. Longitudinal studies could investigate ways in which these students get stuck or sucked into pitfalls. In addition, longitudinal studies could examine relationships and families that these young people belong to and what types cultivate creativity.

This study's finding can be useful in clinical practice as well. Practitioners might want to think about incorporating assessments like those that CLEOS uses, especially those that are interest and value based. It would be beneficial for practitioners to be aware of differences in creative males and females. Knowing the difficulties these young people face will allow practitioners to educate their clients on ways to steer clear of danger zones.

Gifted students tend to make decisions about their career choices at very young ages (Wai, Lubinski, & Benbow, 2005). Therefore, career interventions as early as the end of elementary school could start to tackle the problem. Our main goal for creative young people is to help them reach their potential. Kerr suggests career preparation emphasizing academics (especially science and mathematics), goals, and recognizing internal and external barriers to accomplishing goals.

Values-based assessments are crucial when working with creative individuals. They allow the students to study their wide range of interests and abilities in terms of what careers fit closest with their values. Persuading students to set goals that match their values and needs has been found to be an effective intervention for multipotentiality when using a career service (Kerr & Griest-Priebe, 1988). Furthermore, the effects of values-based career counseling on the development of multipotential college students was studied, and those in the experimental group developed their identity more than those in the control group (Kerr & Erb, 1991).

Interviews, self-reports, and biographical reports have shown one of the heaviest influences on creative students' success was the mentor relationship (Casey & Shore, 2000; Bloom, 1985). They go on to suggest the mentorships begin in the last years of elementary school and deal mostly with career counseling. Furthermore, Hébert & Olenchak (2000) found creative underachieving males who have a mentor tend to reverse the problems they experience. They also found the best mentors for young adults showed open-mindedness, a nonjudgmental attitude, and a sincere care and belief in the adolescents. In addition, mentors used interventions that were interest and strength based. This study has highlighted the importance of teaching young creative individuals the traps society has set for them. Perhaps pairing creative youth with a mentor is an effective way of bypassing some of those pitfalls.

High school can be a time to break free of the monotony of standard academic experiences. With the help of mentors and an understanding of what it means to be creative, students can begin taking college courses through their high school, get involved in extracurricular activities, and meet with groups who are like-minded. Maxwell (2007) suggests one way to ensure our young creative students get the mentoring they need is to have school counselors create mentoring programs. The idea is that the CLEOS laboratory and those like it are the first step in shaping the lives of creative young adults so that they can become eminent in their fields of study.

Conclusion

This study highlighted the variations in creative young people in terms of sex. This study looked at sex differences in 549 adolescents, ranging in age from 13 to 18 years, who have come to CLEOS. The study assessed sex differences in terms of vocational interests, personality, and values by using the Vocational Preference Inventory (VPI), Personality Research Form (PRF), the Six Factor Personality Questionnaire (SFPQ), the NEO PI-R, the Tellegen Absorption Scale (TAS), and the Rokeach Values Inventory. Despite the androgyny in the creatively gifted students studied, they still displayed personality differences found in the greater population. This study began to study the importance in finding ways to help our creative female and male students achieve their potential. New and better interventions should be explored in the future.

Although many think being creative means having all the tools necessary to thrive, we know there are major obstacles that these young people face. We as counselors and teachers have to help them overcome these barriers and pursue their academic passions. Finding interventions that work will help creative individuals in ways that can change our world.

Nevertheless, if we stop encouraging originality and creativity or refuse to offer educational resources to our creative youth, humanity will suffer.

REFERENCES

ACT (2009). *National Ranks for Test Scores and Composite Score*. Retrieved December 12, 2009, from http://www.actstudent.org/scores/norms1.html

Amabile, T. M. (1982). Social psychology of creativity: A consensual assessment technique. *Journal of Personality and Social Psychology*, 43, 997-1013.

American Psychological Association. (2002). Ethical principles of psychologists and code of conduct. Retrieved May 28, 2009, from http://www.apa.org/ethics/code2002.html

Bloom, B. S. (1985). *Developing talent in young people.* New York, NY: Ballantine Books.

Butterfield, E. C., & Feretti, R. P. (1987). Toward a theoretical integration of cognitive hypothesis about intellectual differences among children. In J. G. Borkowski, & J. D. Day (Eds.), *Cognition in special children: Comparative approaches to retardation, learning disabilities, and giftedness* (pp 195-233). Norwood, NJ: Ablex.

Callahan, C. M., Cunningham, C. M., & Plucker, J. A. (1994). Foundations for the future: the socio-emotional development of gifted, adolescent women. *Roeper Review*, 17, 99-105.

Casey, K., & Shore, B. (2000). Mentor's contributions to gifted adolescents' affective, social, and vocational development. *Roeper Review*, 22(4), 227-230.

Colangelo, N. & Assouline, S. G. (2000). Counseling gifted students. In *International Handbook of Giftedness and Talent (2nd)*. Heller, K. A., Monks, F. J., Sternberg, R. J., & Subotnik, R. F. (Eds.). New York, NY: Elsevier Applied Science Publishers/Elsevier Science Publishers.

Colangelo, N., Kerr, B., Christensen, P., & Maxey, J. (1993). A comparison of gifted underachievers and gifted high achievers. *Gifted Child Quarterly, 37,* 155-160.

Costa, P. T., & McCrae, R. R. (1992). *Revised NEO Personality Inventory (NEO-PI-R) and NEO*

Five-Factor Inventory (NEO-FFI) professional manual. Odessa, FL: Psychological Assessment Resources.

Cramer, R. H. (1989). Attitudes of gifted boys and girls towards math: A qualitative study. *Roeper Review*, 11, 128-133.

Csikszentmihalyi, M. (1985). Emergent motivation and the evolution of the self: Motivation in adulthood. In D. Kleiber & M. H. Maehr (Eds.). *Advances in motivation and achievement: Volume 4* (pp. 93-119). Greenwich, CT: JAI Press.

Csikszentmihalyi, M. (1988). Society, culture, and person: A systems view of creativity. In Sternberg, Robert J (Ed.), *The nature of creativity: Contemporary psychological perspectives.* (pp. 1325-1339). New York: Cambridge University Press.

Csikszentmihalyi, M. (1996). *Creativity: Flow and the psychology of discovery and invention*. New York: HarperCollins.

Csikszentmihalyi, M. (1999). Implications of a systems perspective for the study of creativity. In Sternberg, Robert J (Ed.), *Handbook of creativity.* (pp. 1313-1335). New York: Cambridge University Press.

Csikszentmihalyi, M., Rathunde, K., & Whalen, S. (1993).*Talented teenagers.* New York: Cambridge University Press.

Dauber, S. L., & Benbow, C. P. (1990). Aspects of personality and peer relations of extremely talented adolescents. *Gifted Child Quarterly*, 34, 10-15.

Feingold, A. (1994). Sex differences in personality: A meta-analysis. *Psychological Bulletin, 116(3)*, 429-456.

Feldman, D. (1999). A developmental, evolutionary perspective on gifts and talents. *Journal for the Education of the Gifted,* 22(2), 159-167.

Fennema, E., Peterson, P. L., Carpenter, T. P., & Lubinski, C. A. (1990). Teachers' attribution and beliefs about girls, boys, and mathematics. In E. Fennema & G. Leder (Eds.), *Mathematics and gender* (pp. 1-9). New York: Teachers College Press.

Feist, G. J. (1998). A meta-analysis of personality in scientific and artistic creativity. *Personality and Social Psychology Review*, 2, 290-309.

Flanagan, D. P., & Harrison, P. L. (2005). Contemporary intellectual assessment: Theories, test, and issues (2nd ed.). New York: Guilford Press.

Fredrickson, R. (1982). A multipotential approach to career planning. In *Career information* (pp. 42-47). Englewood Cliffs, NJ: Prentice Hall.

Frederickson, R. H., & Rothney, J. W. M. (Eds.). (1972) *Recognizing and assisting multipotential youth.* Columbus, OH: Merrill.

Gardner, H. (1983). *Frames of mind: The theory of multiple intelligences.* New York: Basic Books.

Gardner, H. (1993). *Creating minds: An anatomy of creativity seen through the lives of Freud, Einstein, Picasso, Stravinsky, Eliot, Graham, and Gandhi.* New York: Basic Books.

Gardner, H. (1993). *Multiple intelligences*. New York: Basic Books.

Gardner, H. (1999). *Intelligence reframed: Multiple intelligences for the 21st century.* New York: Basic Books.

Good, T. L., & Brophy, J. E. (1986) *Educational psychology: A realistic approach* (3rd ed.). New York: Longman.

Guilford, J. P. (1950). Creativity. *American Psychologist, 5*, 444 - 454.

Guilford, J. P. (1967). *The nature of human intelligence.* New York: McGraw-Hill.

Hamachek, D. E. (1978). Psychodynamics of normal and neurotic perfectionism. *Psychology*, 15, 27-33.

Hébert, T. P. (2001). "If I had a new notebook, I know things would change": Bright underachieving young men in urban classrooms. *Gifted Child Quarterly, 45*, 174-194.

Hébert, T. P. (2002). Gifted males. In M. Neihart, S. M. Reis, N. M. Robinson, & S. M. Moon (Eds.), *The social and emotional development of gifted children: What do we know?* (pp. 137-144). Waco, TX: Prufrock Press.

Hébert, T. P. (2006). Gifted university males in a Greek fraternity: Creating a culture of achievement. *Gifted Child Quarterly*, 50, 26-41.

Hébert, T .P. & Olenchak, F. R. (2000). Mentors for gifted underachieving males: Developing potentioal and realizing promise. *Gifted Child Quarterly*, 44, 196-207.

Holland, D. C., & Eisenhart, M. A. (1990). *Educated in romance: Women, achievement, and college culture.* Chicago, IL: University of Chicago.

Holland, J. L. (1958). A personality inventory employing occupational titles. *Journal of Applied Psychology*, 42, 336-342.

Holland, J. L. (1985). *Manual for the Vocational Preference Inventory.* Odessa, FL: Psychological Assessment Resources.

Jackson, D. N. (1984). *Personality Research Form manual.* Port Huron, MI: Sigma Assessment Systems.

Kerr, B. A. (1994). *Smart girls: A new psychology of girls, women, and giftedness (rev. ed.).* Scottsdale, AZ: Gifted Psychology Press.

Kerr, B. A. (2007). Science, spirit, and talent development. In S. Mendaglio & J. S. Peterson (Eds.), *Models of counseling gifted children, adolescents, and young adults* (pp. 231-252). Austin, TX: Prufrock.

Kerr, B. A., & Cohn, S. J. (2001). *Smart boys: Talent, manhood, and the search for meaning.* Scottsdale, AZ: Great Potential Press.

Kerr, B. A., & Colangelo, N. (1988). The college plans of academically talented students. *Journal of Counseling and Development*. 67(1), 42-48.

Kerr, B. A., & Colangelo, N., & Gaeth, J. (1988). Gifted adolescents' attitudes toward their giftedness. *Gifted Child Quarterly*, 32, 245-247.

Kerr, B. A., & Griest-Priebe, S. L. (1988). Intervention for multipotentiality: Effects of career counseling laboratory for gifted high school students. *Journal of Counseling and Development*, 66, 366-370.

Kurpius, S. E., Kerr, B., & Harkins, A. (2005). Handbook for counseling girls and women: Ten years of research from the National Science Foundation: Gender equity projects at Arizona State University. Mesa, AZ : Nueva Science.

Kerr, B., & Erb, C. (1991). Career counseling with academically talented students. Effects of a value-based intervention. *Journal of Counseling Psychology*, 38(3), 309-314.

Klein, A. G., & Zehms, D. (1996). Self-concept and gifted girls: A cross sectional study of intellectually gifted females in grades 3, 5, 8. *Roeper Review*, 19(1), 30-33.

Kline, B. E., & Short, E. B. (1991). Changes in emotional resilience: Gifted adolescent females. *Roeper Review*, 13, 118-121.

Kramer, L. R. (1991). The social construction of ability perceptions: An ethnographic study of gifted adolescent girls. *Journal of Early Adolescence*, 11(3), 340-362.

Leroux, J. A. (1988). Voices from the classroom: Academic and social self-concepts of gifted adolescents. *Journal for the Education of the Gifted*, 11(3), 3-18.

Maxwell, M. (2007). Career counseling is personal counseling: A constructivist approach to nurturing the development of gifted female adolescents. *Career Development Quarterly*, 55, 206-224

McCurdy, H. G. (1983). The childhood pattern of genius. In R. S. Albert (Ed.), *Genius and eminence: the social psychology of creativity and exceptional achievement* (pp. 155-169). Tarrytown, NY: Pergamon Press.

McCrae, R. R. (1987). Creativity, divergent thinking, and openness to experience. *Journal of Personality and Social Psychology*, 52, 1258-1265.

Mendaglio, S. (2007). Affective-cognitive therapy for counseling gifted individuals. In S. Mendaglio & J. S. Peterson (Eds.), *Models of counseling gifted children, adolescents, and young adults* (pp. 35-68). Austin, TX: Prufrock.

Murray, H. (1938). *Explorations in personality.* New York: Oxford University Press.

Olszewski-Kubilius, P. M. (2000). The transition from childhood giftedness to adult creative productiveness: Psychological characteristics and social supports. *Roeper Review*, 23, 65-71.

Olszewski-Kubilius, P. M., Kulieke, M. J., & Krasney, N. (1988). Personality dimensions of gifted adolescents: A review of the empirical literature. *Gifted Child Quarterly*, 32(4), 347-352.

Peterson, J. S. (2007). A developmental perspective. In S. Mendaglio & J. S. Peterson (Eds.), *Models of counseling gifted children, adolescents, and young adults* (pp. 97-126). Austin, TX: Prufrock.

Pintrich, P. R., & Blumenfeld, P. C. (1985). Classroom experience and children's self-perceptions of ability, effort, and conduct. *Journal of Educational Psychology*, 77, 646-647.

Plucker, J., Beghetto, R. A., & Dow, G. (2004). Why isn't creativity more important to educational psychologists? Potential, pitfalls, and future directions in creativity research. *Educational Psychologist, 39,* 83 - 96.

Reis, S. M. (1998). *Work left undone: Compromises and challenges of talented females.* Mansfield Center, CT: Creative Learning Press.

Reis, S. M., Callahann, C. M., & Goldsmith, D. (1996). Attitudes of adolescent gifted girls and boys toward education, achievement, and the future. In K. D. Arnold, K. D. Noble, & R. F. Subotnik (Eds.), *Remarkable women: Perspectives on female talent development* (pp. 209-224). Cresskill, NJ: Hampton Press.

Reis, S. M., & Hébert, T. P. (2008). Gender and giftedness. In S. I. Pfeiffer (Ed.), Handbook of *Giftedness in children: Psychoeducational theory, research, and best practices* (pp. 217-291). Tallahassee, FL: Springer.

Reis, S. M., Hébert, T P., Diaz, E. I., Maxfield, L. R., & Ratley, M. E. (1995). *Case studies of talented students who achieve and underachieve in an urban high school* (Research Monograph No. 95120). Storrs, CT: The National Research Center on the Gifted and Talented.

Reis, S. M., & McCoach, D. B. (2000). The underachievement of gifted students: What do we know and where do we go? *Gifted Child Quarterly,* 44(3), 152-170.

Rimm, S. (1999). *See Jane win.* New York: Random House.

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

Runco, M. A. (2005). Creative giftedness. In R. J. Sternberg & J . E. Davidson (Eds.), *Conceptions of giftedness.* (pp. 295-311). New York: Cambridge University Press.

Sadker, M., & Sadker, D. (1994). *Failing at fairness: How America's schools cheat girls*. New York: Charles Scribner's Sons.

Sampson, J. P., Jr., Peterson, G. W., Lenz, J. G., Reardon, R. C., & Saunders, D. E. (1996). *Career thoughts inventory: Professional manual.* Odessa, FL: Psychological Assessment Resources.

Sampson, J. P., Jr., Peterson, G. W., Lenz, J. G., Reardon, R. C., & Saunders, D. E. (1998). The design and use of a measure of dysfunctional career thoughts among adults, college students, and high school students: The Career Thoughts Inventory. *Journal of Career Assessment*, 6, 115-134.

Schuler, P. A. (1997). *Characteristics and perceptions of perfectionism in gifted adolescents in a rural school environment.* Unpublished doctoral dissertation, University of Connecticut, Storrs.

Schunk, D. H. (1984). Sequential attributional feedback and children’s achievement behaviors. *Journal of Educational Psychology*, 75(4), 511-518.

Silverman, L. K. (1992). Career counseling. In L. K. Silverman (Ed.), *Counseling the gifted and talented* (pp. 215-238). Denver, CO: Love Publishing.

Spencer, S. J., Steele, C. M., & Quinn, D. M. (1999). Stereotype threat and women's math performance. *Journal of Experimental Social Psychology*, 35, 4-28.

Sternberg, R. J., Kaufman, J. C. & Pretz, J. E. (2002). *The creativity countdown.* New York:

Psychology Press.

Sternberg, R. J., & Lubart, T.I. (1995). *Defying the crowd.* New York: Free Press.

Sternberg, R. J., & Lubart, T.I. (1999). The concept of creativity: Prospects and paradigms. In R. J. Sternberg (Ed.), *The handbook of creativity* (pp. 3-15). New York: Cambridge University Press.

Sternberg, R. J., & O'Hara, L. A. (1999). Creativity and Intelligence. In R. J. Sternberg (Ed.), *The handbook of creativity* (pp. 251-272). New York: Cambridge University Press.

Swiatek, M. A. (2001). Social coping among gifted high school students and its relationship to self-concept. Journal of Youth and Adolescence, 30(1), 19-39.

Terman, L. M. (1916). *The measurement of intelligence.* Boston: Houghton Mifflin.

Terman, L. M. (1925). *Genetic studies of genius: Vol. 1 Mental and physical traits of a thousand gifted children.* Stanford, CA: Stanford University Press.

Thompson, M. (2000). Speaking of boys: Answers to the most-asked questions about raising sons. New York: Ballantine Books.

Wai, J., Lubinski, D., & Benbow, C. (2005). Creativity and occupational accomplishments among itellectually precocious youths: A age 13 to age 33 longitudinal study. *Journal of Educational Psychology*, 97, 484-492.

Wainer, H., & Steinberg, L. S. (1992). Sex differences in performance on the mathematics section of the Scholastic Aptitude Test: A bidirectional validity study. *Harvard Educational Review, 62(3)*, 323-336.

Whitmore, J. R. (1986). Understanding a lack of motivation to excel. *Gifted Child Quarterly, 30*, 66-69.

Appendix A: Student Profile Creative Domain Checklist

Dear Gifted Coordinator,

For creatively gifted young people, the path to the fulfillment of their talents is often mysterious. How to cultivate creative talents in higher education and how to find a career that values inventiveness and original thinking can seem overwhelming.

In association with Department of Psychology and Research in Education at The University of Kansas, the Counseling Laboratory for the Exploration of Optimal States (CLEOS) is starting its sixth semester of helping over 500 creative, bright students to understand their potential and to begin to map possible directions post high school.

You and your professional colleagues have done a remarkable job of selecting students to send to our lab using our suggestions, which are based on our profiles of creative, eminent individuals *as teens.*

We'd like to streamline the process for you and make sure the students you identify and work so hard to get to CLEOS are the kids who will benefit the most from the experience, so we have revised our profiles to reflect what we've learned from working with students from across the state - and most important, to make your nominator job a little easier. Unfortunately, two aspects of creativity – the tendency to specialize in one domain and the tendency to be highly internally motivated – can lead to underachievement in courses other than those the student likes. Most important, *many of these students may not have qualified for gifted education programs*, because of their concentration on their areas of interest rather than on being "well-rounded" students. This presents a dilemma for teachers who have to justify to others why a person with a less than stellar record gets to go to CLEOS! We encourage that you share that this it is not a privilege to be selected, but simply *a referral for career services for people who are likely to be going into nontraditional occupations that require specialized guidance*. In addition, KU provides many programs for academically talented, and we'll be glad to arrange referrals for those who desire career development help.

Kids who REALLY benefit from attending CLEOS	Kids who aren't a great fit for CLEOS
High achieving – primarily in the courses that fit their interests	Overall high achievers
Quirky, odd, even a little weird around others especially if they do not share the student's interests	Generally sociable OR antisocial whatever the circumstances
Dogged – even obsessive about their interests	Happy to be learning- balanced among topics
Independent thinker – opinions, judgments, standards, skills and information needed to accomplish personal goals	Noncompliant OR overly dependent on authority
Often unwilling to listen to the advice and opinions of others.	Teacher Pleasers
Those who are well on their way to publishable	

work, patentable inventions, and recognized art and music.	

Finally, there are some students who hang out with creative students, who dress like them, and who are nonconforming, but are not particularly creative. They might be "wannabes" or just plain antisocial types who have found a group that tolerates their deviations from appropriate peer behavior. These will be hard to winnow out, but the proof is in the product. Most of the students who come to CLEOS have already created outstanding art, music, blogs, websites, photography, inventions, dances, or have established innovative organizations or thriving businesses. Remember that not all of them have received public recognition for their work – but some teachers and peers can tell you what they have created in their garage or at their desk at night!

We hope these observations, and our new and improved profiles; can help you with the task of sending a team of students to CLEOS. Thank you so much for your excellent work so far, and please visit our website at www.cleoslab.org to see the newest findings that you and your students made possible. For your convenience, we have included a copy of our "Creative Domain Checklist" at the end of this letter, a profiling tool that you can use to help in the process of selecting students to participate in this project. Ideally, we would like coordinators to bring at least one student from each of the above categories, so that we are able to fulfill our goal of serving a broad spectrum of creative students.

Are you interested in bringing your students to CLEOS?

On Thursdays this Fall, we will be hosting workshops for groups of up to 12 students from the Midwest school districts to visit KU for a 1day career development workshop. The workshop will include the following components:

- Individual assessment and interpretation of interests, personality characteristics and values using state of the art methods
- Individualized counseling for college and career planning, activities for identifying and overcoming barriers to goals and dreams
- a Personal Map of the Future to guide decision making

The techniques used will be based on research on career development of talented people, and approved by institutional review. The staff will consist of masters and doctoral level student counselors from KU's Counseling Psychology program, supervised by faculty psychologists.

For those schools that choose to participate, we ask that the students be released from school for one day, and that a staff member from the school accompany the group as a chaperone. We ask that the school provide the students' transportation. The cost of tests and materials will be $25 per student.

We are excited to offer this opportunity to creatively gifted students, and look forward to hearing from you! Feel free to contact us with questions or to schedule a time when students from your school can come to KU for this experience. We can be reached by email or

telephone and have a new website that provides additional information and the opportunity to sign up directly; www.cleoslab.org .

Warm Regards,
The CLEOS Staff

Student's Name: Date: Year in School: School: Enrolled in Gifted Education Program: Yes / No		
Creative Domain	**Characteristics (Check all characteristics that apply for this student):**	
Linguistic		Avid reader of many genres, very knowledgeable about particular ones, such as science fiction or graphic novels
		High scores on verbal achievement of literature tests
		Extraordinary vocabulary
		Sophisticated, original, cutting edge writer of poetry, fiction, nonfiction, blogs.
		Advanced ability to learn languages rapidly
		Swift wit and humor, often extremely funny
		Excellent grades in Language Arts/English/or native language/ foreign language
Interpersonal/Intrapersonal		Intuitive and insightful with others
		Natural helper; other students will go to this individual for help
		Ability to form relationships with and adapt their style across cultures and age groups
		Excellent grades in social sciences, debate, rhetoric, and leadership courses
		Self-reflective in both oral and written expression
		Ability to analyze and regulate his or her own feelings
		Natural leader who leads through influence rather than domination.
Spatial/Visual		Ability to draw models and design with technical skill and imagination
		Ability to manipulate images and geometric shapes in his or her mind; for example in chess, video games or other visual activities
		Capacity to create original cartoons, paintings, photos, graphic art, or sculpture, or work easily in a variety of visual media
		Doodles and draws on papers, notebooks, other surfaces

		Designs websites, power points, games; uses and modifies images on computers with ease with programs such as Photoshop
		A love of tinkering with machines or improving fashions using new materials and techniques.
		Excellent grades in art, shop, mechanical drawing, or other course emphasizing spatial/visual ability such as geometry and geography

Musical		Intuitive ability to sing or play music with ease and imagination
		Composes music for rock band, jazz group, band, orchestra, or choir
		Plays or sings in own music group
		Excellent musical knowledge in one or more genres, such as hip hop, jazz, pop, or classical
		Excellent pitch, rhythm or musical memory
		Excellent grades in music classes
		Recognition as musician in his or her own community
Scientific /Mathematical		A "born scientist" who loves learning about the natural and physical world and universe
		Creates his or her own way of solving mathematical problems and performs complex operations in his or her head.
		Inventive and innovative in methods and materials
		Recognition at science fairs, math Olympiads, other contests of math, scientific or technical skill.
		In depth knowledge and love of topics such as robotics, rocketry, solar energy, software design
		Advanced understanding of mathematical concepts and or principles of chemistry, physics, computer science.
		Excellent grades in math and science courses, unless bored
Kinesthetic		Ability to visualize body in space in order to choreograph or to create winning plays and use bodily memory to anticipate movement
		Ability to use body for symbolic expression
		Brilliant dancer, gymnast, athlete, actor/actress
		Moves about, restless sitting still
		Advanced knowledge of health issues
		Moves gracefully and powerfully
		Recognition for individual kinesthetic accomplishments

Appendix B: Demographic Form

Name: **Date:**
Permanent Address:
Age: **Grade:** **School:**
Email: **Myspace.com (optional):**
What is your ethnic background? ___African American ___Asian ___Hispanic/Latino ___Native American (Tribe?_____) ___European American ___Other (please specify:_____)
Does your father live at home? ___Yes ___No
Does your mother live at home? ___Yes ___No
Do any other adults live at home? ___Yes ___No
If yes, what is their relationship to you?
Number of children in your family, including you:_____
Do you have a brother who has attended college? ___Yes ___No
Do you have a sister who has attended college? ___Yes ___No
Is your father currently employed? ___Yes ___No If yes, what does he do?
What is your father's level of completed education? _ _ _ Some grade school ___8th grade ___High school/GED ___Some college/technical training ___2-year college ___College ___Graduate school
Is your mother currently employed? ___Yes ___No If yes, what does she do?
What is your mother's level of completed education? _ _ _ Some grade school ___8th grade ___High school/GED ___Some college/technical training ___2-year college ___College ___Graduate school
Do you work? ___Yes ___No If yes, what do you do? Hours/week?
Are you active in extracurricular activities? ___Yes ___No If yes, which ones?
What are your favorite courses?
What is your current career goal?
To be completed by the Gifted Education Coordinator Student's GPA: Most Recent Standardized Test Scores (Specify):