

THE RELATIONSHIP BETWEEN CREATIVITY AND PSYCHOSOCIAL  
DEVELOPMENT AMONG COLLEGE HONORS STUDENTS  
AND NON-HONORS STUDENTS

A Dissertation

by

AMY ELIZABETH DUPRÉ CASANOVA

Submitted to the Office of Graduate Studies of  
Texas A&M University  
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

August 2008

Major Subject: Educational Psychology

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Approved by:

Chair of Committee,	William R. Nash
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## ABSTRACT

The Relationship Between Creativity and Psychosocial Development Among College Honors Students and Non-Honors Students. (August 2008)

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M.S., Oklahoma State University

Chair of Advisory Committee: Dr. William R. Nash

The purpose of this study was to determine if there was a difference in measures of creativity and psychosocial development in college Honors and Non-Honors students and also to determine interaction effects of demographic and academic background data. Additionally, another purpose was to establish any relationship between measures of creativity and psychosocial development. Of the 284 college students participating, 120 were honors students and 164 were non-honors students. Participants were administered the *Torrance Tests of Creative Thinking* (TTCT) Verbal Form B, Activities 4 and 5 and the *Student Development Task and Lifestyle Assessment* (SDTLA). The TTCT included scales of fluency, flexibility, originality, and average standard creativity score. The SDTLA includes the measurement of three developmental tasks, ten subtasks, and two scales. The participants were volunteers and were tested in four regularly scheduled classes during the 2006 spring and summer semesters.

Two-tailed independent t-tests performed on the dependent variables of the TTCT indicated that the Non-Honors student's scores were statistically significantly

higher on fluency, originality, and the average standard creativity measures. On the average standard score, which is considered the best overall gauge of creative power, neither Non-Honors nor Honors student groups TTCT scores were considered higher than weak (0-16%) (Torrance, 1990). The results of the two-tailed independent t-tests performed on the dependent variables of the SDTLA resulted in the statistically significant higher development outcome scores in the Honors students. The mean SDTLA scores of both the Honors and Non-Honors scores were not outside of norm group average scores. The MANOVA data produced moderately statistically significant interaction effects between classification level and fluency. However, the post hoc tests did not confirm the difference in classification and fluency. Additional MANOVA data indicated a significant interaction effect between ethnicity and Lifestyle Planning (LP), and post hoc analysis confirmed the interaction with significant differences in Caucasian and "Other" students. Classification level significantly interacted with eight of the fourteen development outcomes, nevertheless the post hoc tests showed inconsistent differences between classification groups within the developmental outcomes. Correlations between the TTCT and SDTLA did not yield statistically significant relationships between the creativity and psychosocial development variables.

## DEDICATION

I would like to dedicate the completion of this degree to my family, my friends, my dear dog-child, Sully, and my wonderful husband, Mark. You have all helped me achieve the completion of my Ph.D., each in your own immeasurable and special ways.

My friends and family, who were both supportive and understanding of my work, your love and friendship is immensely valued and appreciated. I would not be where I am today, without each of you.

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## CHAPTER I

### INTRODUCTION

Is this the moment in time when leaders in this technically oriented society move forward from valuing a knowledge-based society to valuing creativity? In the past several years several nationally recognized leaders in politics, education and business have focused on innovation and creativity in speaking engagements or writing. Examples of these are Sir Ken Robinson speaking to the National Governors Association on August 7, 2006, about the importance of creativity in education; John Edwards, former Presidential candidate, in a speech to the National Press Club on June 22, 2006 talking about the necessity of innovation; Lawrence Summers, former Harvard University President, on This Week with George Stephanopoulos on June 25, 2006 addressing student creativity; the June 19, 2006 edition of Business Week devoting an entire section to creativity and innovation; and on February 6, 2007 Texas Governor Rick Perry mentioned the importance of innovation in his annual State of the State speech.

It would appear that there is an increased awareness of the importance of innovation and creativity in the United States, as evidenced by these newsworthy examples. America's leadership in innovation depends on the development, cultivation, and fostering of creativity, which is in large part the responsibility of the education system. However, while "creativity has become the sine qua non of a successful

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This dissertation follows the style of *Journal of College Student Development*.

America (Tepper, 2004, p.B6)” and “nurturing it is seen as an important public good, not only benefiting individuals, but contributing to the economic health and well-being of the country at large (Ibid, p.B6)” creativity is not emphasized in colleges and universities. In fact, it is taken “for granted that higher education fosters creativity” (Tepper, 2004, p.B6). Often it appears that student’s creativity thrives in spite of their college and university experiences (Douglas, 1991; Tepper, 2004). Cultivating the creativity of college students will continue to be necessary for the U.S. to maintain its place as a leader of innovation.

### **Statement of the Problem**

To begin this discussion, innovation and creativity must be defined. At its most basic level, creativity can be described as generating new and improved ideas, and innovation is described as implementing those ideas into practice (West & Rickards, 1999). While Texas acknowledged the importance of creativity in K-12 education in the 1996 State Plan for the Education Gifted/Talented Students by establishing a goal that “gifted students will demonstrate skills in self-directed learning, thinking, research, and communication as evidenced by the development of innovative products and performances that reflect individuality and creativity” (Texas Education Agency, 2000, p. 1), it has lagged behind in its commitment to creativity in higher education.

Creativity research focused on college students appears to be minimal. The limited amount of research that has been done indicates that some highly creative college students may not complete college, have academic difficulties in college, or change their

major with higher frequency (Heist, 1968b). This is an interesting finding, since many definitions of giftedness include creativity as an important component. The establishment of the honors program appears to be the closest thing to a specific program for gifted and talented college students and, by using a portion of the definition from the K-12 education system, creative students.

Because participation in honors programs is based on high achievement qualifications, and the benefits can include smaller classes, more faculty interaction, and high quality learning experiences, it needs to be assessed as to whether or not honors programs actually produce more creative and psychosocially developed students. Due to the importance of creativity and psychosocial development in higher education, it is crucial that they be analyzed concurrently. The inclusion of honors students is important due to the emphasis many colleges place on honors programs and because of the assumption that they are the best and brightest of college students. The question remains whether honors students are more creative and have higher levels of psychosocial development than non-honors students.

In addition to the cultivation of creativity and innovation in college students being recently established as a crucial goal of higher education, the concept of educating the whole student has historically been an important component of higher education's mission (Nuss, 1996; Rudolph, 1991; Upcraft & Moore, 1990). The development of well-adjusted individuals, who are ready to achieve their goals and make contributions to the world, is a necessity. Another necessary goal of higher education should then be to

encourage the positive psychosocial developmental changes in students (Chickering, 1981).

In response to the public calls for more emphasis on and awareness of innovation and creativity, several questions must be asked, especially in relation to their role in higher education. Does participation in higher education contribute to a creative society? What role would high achieving students play in this creative society? To what extent are honors programs and creativity related? How does higher education foster psychosocial developmental opportunities?

### **Purpose of the Study**

The purpose of this study was to investigate whether creativity and psychosocial development are different among college honors and non-honors students, while also evaluating the demographic and academic background data for important subgroup relationships. An additional purpose was analyzing the relationship between creativity and psychosocial development, while evaluating interaction effects of the demographic and academic background data. The results of the research provide a better understanding of creativity and psychosocial development in college students in relationship to their participation in honors programs and whether demographic and academic background information is important to these research constructs. Additionally, the information gained from this study can be applied to not only honors programs, but also educational settings that aid in fostering creativity and all constituents of higher education.



### **Research Questions**

1. Is there a significant difference between college honors students and non-honors students on creativity scores from the *Torrance Tests of Creative Thinking* (TTCT) and are there interaction effects based on age, ethnicity, gender, classification, area of major and academic background factors?
2. Is there a significant difference between college honors students and non-honors students on psychosocial development scores from the *Student Development Task and Lifestyle Assessment* (SDTLA) and are there interaction effects based on age, ethnicity, gender, classification, area of major and academic background factors?
3. Is there a significant relationship between creativity scores and psychosocial development scores and are there interaction effects based on age, ethnicity, gender, classification, area of major and academic background factors?

### **Limitations**

1. Students who participated in the study are volunteers; and thus selection bias may be present.
2. The power of statistical findings may be limited by the relatively small sample size, particularly within the ethnic and racial sub-groups of students.
3. Because students are designated as Honors or Non-Honors, it was not possible to determine whether a student was eligible for the honors program, but did not participate.

4. If a student was eligible for the honors program but did not participate, and they show high scores on creativity and development assessment, the overall group scores could be skewed.
5. No causal interpretations can be made from these results, if significance is found.
6. Only two sections of the *Torrance Tests of Creative Thinking* (TTCT) were used.

### **Definition of Terms**

Creativity – “Process of becoming sensitive to problems, deficiencies, gaps in knowledge, missing elements, disharmonies, and so on; identifying the difficulty; searching for solutions, making guesses, or formulating hypotheses about the deficiencies, testing and retesting these hypotheses and possibly modifying and retesting them; and finally communicating the results” (Torrance, p. 8, 1974).

Psychosocial Development – “A series of developmental tasks or stages, including qualitative changes in thinking, feeling, behaving, valuing, and relating to others and to oneself” (Chickering & Reisser, 1993, p.2).

Honors program – “The total set of ways by which an academic institution attempts to meet the educational needs of its ablest and most highly motivated students” (Austin, 1975, p160).

Honors Students – Students who are eligible for and are participating in an honors program. Eligible first semester freshmen at Texas A&M University must graduate in the top 10% of their high school class and have a 1250 SAT 1/28 ACT or be a National Merit Finalist, National Achievement Finalist, or National Hispanic Scholar. Second

semester freshmen, sophomores, juniors, and seniors are eligible with a GPR or 3.5 or higher. A 3.5 cumulative GPR is required for continuation in the program (Texas A&M University, 2007).

Non-honors students – Students who are not participating in an honors program.

Academic background factors – Characteristics related to measures of academic performance, i.e. area of major, overall college grade point ratio (GPR), SAT/ACT scores, High School rank, Gifted/Talented program participation in High School, and first generation college student.

## CHAPTER II

### REVIEW OF RELATED LITERATURE

*A man searched the known world for the greatest general who ever lived. Unable to fulfill his quest on earth, he ascended to the Pearly Gates. Upon meeting St. Peter, the man said, "I'm looking for the greatest general who ever lived. I have combed the world without success-is such a person here, perhaps?" St. Peter replied, "You are in luck. Just beyond the Gates-over there-is the greatest general who ever lived." "Wait a minute!" exploded the searcher. "You must be mistaken. I knew that man on earth. He was a humble cobbler-not a general!" "Aha!" rejoined St. Peter. "If he had been given the opportunity and encouragement, he could have been the greatest general who ever lived." - Mark Twain*

The story above, told by MacKinnon (1962) and attributed to Mark Twain, illuminates the importance of not only discovering and recognizing potential talent, but also creating the environment for that talent to flourish and grow. In the current study, it is important to understand what is meant by the term "creativity", in both a historical and operational context. In addition, it is also important to understand the history and major theoretical orientations of student development as well as honors programs. This will help to provide the context through which the methods and results of this study can be analyzed.

#### **The History of Higher Education**

The first forms of formal education are based in ancient Greece and Rome and were intended to assist wealthy men gain positions of power. Since that time, methods of formal education have undergone considerable shifts in organizational theory and focus. Higher education or post-secondary education, as we know it in the United

States, has had a relatively recent birth and has undergone its own changes in philosophy and forms of organization.

A brief history of higher education and the creation of student development theory would be helpful in understanding the basis of student development. As Fenske has stated, “in the beginning was the term *in loco parentis*” (1989, p. 5). The first colleges in America utilized the mode of operation, *in loco parentis*. When colleges were first established in early America, all of the staff was expected to act in place of parents, fulfilling the role of the holistic method of education from the traditional English residential university system of the 1700’s, such as Oxford and Cambridge (Thelin, 2003). These Colonial colleges empowered discipline that “was paternalistic, strict, and authoritarian” (Nuss, 1996, p. 24), not to mention a way of life that was “dependent on dormitories, committed to dining halls, permeated by paternalism” (Rudolph, 1991, p. 87). The colleges were typically small, affiliated with a religion, and the faculty and president were responsible for not only the intellectual development, but also the enforcement of student conduct and discipline, as well as moral development of the students (Moore & Upcraft, 1990; Nuss, 1996; Thelin, 2003). This traditional approach to education began in America with the establishment of Harvard in 1636 and continued well into the 1800’s.

Three important developments occurred after the Civil War that contributed to how student development became important in higher education. These included “the shift in emphasis from religious to secular concerns, the expansion of institutions in size and complexity, and the shift in faculty focus from student development to academic

interests” (Fenske, 1989, p. 7). The Morrill Land Grant Act of 1862 gave states the ability to found and develop their own public colleges by providing federal funding. This resulted in increasing the size of college enrollments and making a college education accessible to additional students.

By 1900, nearly all of the states had taken advantage of the landmark law and established state universities. The Morrill Act in 1890 also helped increase college enrollments, by providing public funding and leading to the establishment of Black colleges in seventeen states (Nuss, 1996; Rudolph, 1991). While this legislation increased the opportunities for black students to gain a college education, the “separate but equal” mantra was maintained, thus continuing to limit access to higher education by minority students (Nuss, 1996). This period of time also witnessed increased enrollment of women in higher education, due in part to the establishment of Georgia Female Seminary in 1836 as the first U.S. College for women (Nuss, 1996). The institutions intended for women were typically considered “teachers colleges.” The opening of Vassar College in 1865, initiated a new era for women’s education, as it was the first college to offer a complete curriculum of liberal arts study for women.

Additional changes of educational philosophy and systemic organization in higher education occurred over the next century. The middle 1800’s saw a dramatic shift away from the paternalistic, rules oriented education of the colonial colleges, to a form more closely aligned with the German university emphasizing scholarly research, academic freedom, and the establishment of the professorship (Cowley & Williams, 1991; Nuss, 1996). The Faculty no longer served as disciplinarians for the students and

instead focused solely on research, instruction and intellectual development of the students.

By the early 1900's, a somewhat more relaxed view of education had been implemented at many U.S. colleges and universities (Nuss, 1996). Extracurricular activities were created, as a result of students opposing strict methods of instruction and demanding organizations in which to participate (Nuss, 1996). Although students persevered in their demands and the administrations eventually acquiesced, college administrators generally opposed these extracurricular organizations (Nuss, 1996). Examples include literary and honor societies, such as Phi Beta Kappa, male and female Greek-letter organizations, and an expansion of athletic activities for students (Nuss, 1996). A new educational movement, the honors program, was also created during this period, although they were located mainly at small private Eastern colleges (Rudolph, 1991).

Until the 1940's, many colleges were still very small and had limited choices of majors as well as graduate programs. With the implementation of the Servicemen's Readjustment Act, or the GI Bill, following WWII, a college education became both accessible and available to those who previously did not have that opportunity, dramatically increasing the enrollment numbers of students in institutions of higher education (Nuss, 1996; Thelin, 2003). In fact, the combination of the egalitarian viewpoint along with an expansion of research grants from both government and foundation sources created what some have called the "golden age" of higher education,

which resulted in the unprecedented influence of America's colleges and universities and lasted from 1945 to 1970 (Thelin, 2003).

The civil unrest of the 1960's brought about additional changes in higher education. Increased student activism related to both societal issues, e.g., the Civil Rights movement, the Vietnam War, and the draft, in addition to concerns regarding large classes, impersonal treatment by administrators, lack of student housing and limited connections to faculty created an environment ripe for transformation (Thelin, 2003). Federal interventions that helped result in further increasing enrollment, diversification, and accessibility in colleges were Title IV of the Housing Act in 1950, Vocational Education Act, the Higher Education Facilities Act, the Health Professions Act, the Higher Education Act, Title VI of the Civil rights Act of 1964, Title IX of the Education Amendments of 1972, Section 504 of the Rehabilitation Act of 1973, The Drug Free Schools and Communities Act, the Student Right-to-Know and Campus Security Act of 1990, the Americans with Disabilities Act of 1990, and the Higher Education Amendments of 1992 (Nuss, 1996; Thelin, 2003). Most of these bills and laws were designed to decrease discrimination in higher education and provide equal access and opportunities in programs and education that received federal monies (Nuss, 1996).

In more recent times, the focus has been on the student as consumer, with more and more emphasis placed on accountability, program evaluation, and outcomes. The federal and state governments have reduced funding for higher education, resulting in increased financial difficulty for colleges and universities, requiring them to "do more



with less” (Thelin, 2003, p. 18). These current pressures, as well as others, on institutions of higher education, bring to the forefront the importance of several issues investigated in this study.

### **Psychosocial Development**

The increased demand for on-campus student services and having people other than faculty handle student events and activities outside of class, led to the creation of student affairs units on college and university campuses. As a result, the creation of and later, expanded emphasis on student affairs, helped to foster research and understanding of student development. In 1962, the landmark work of Nevitt Sanford was the first investigation of college students through the eyes of behavioral and social scientists (Thelin, 2003). This was the beginning of applying developmental theories to college age individuals. In addition, researchers began viewing the college student as belonging to a separate developmental age group, traditionally perceived to be ages eighteen to twenty-two. As a result, understanding the development of the student over the course of their four years in college became important to all constituents of higher education.

So, why is development important? It is important because most leaders in higher education agree with “the fundamental presuppositions that people can change and that *educators and educational environments can facilitate that change*” (Miller & Winston, 1990, p. 99). To further this idea, the main “issue is not so much whether the higher education experience promotes growth and development beyond the intellectual domain alone, for there is consensus that it does, but rather what forms that development

takes and how it can be identified and assessed” (Miller & Winston, 1990, p. 100).

These models provide a means for understanding and assessing “where students are, where they are going, and how they get there” in terms of their own growth and development” (Strange & King, 1991, p. 16).

There are several types of development that could be considered when discussing student development, i.e. cognitive, psychosocial, moral, physical, etc. In fact, when looking at college student development, it appears that several researchers determined the theories available could be divided into three distinct models. Those investigators have identified the models to be personological, environmental, and person-environment interaction (Widick, Parker, & Knepfkamp, 1978a; Rodgers, 1990b). The personological model describes the individual differences of students. The environmental model describes the milieu that students’ experience. The person-environment interaction model illustrates the interactions of the student and their environment.

However, other researchers divide student development theories into five categories, including psychosocial, cognitive developmental, maturity, typology, and person-environment interaction (Widick et al., 1978a). Both psychosocial and cognitive developmental theorists give methods of describing where students are developmentally and go on to clarify how developmental changes took place (Widick et al., 1978a). Psychosocial development is defined as a series of developmental tasks or stages, including qualitative changes in thinking, feeling, behaving, valuing, and relating to others and to oneself (Chickering & Reisser, 1993). Cognitive developmental theories

explain the stages involving permanent shifts in certain modes of thinking, perceiving, and reasoning (Widick et al., 1978a). Maturity models of development synthesize developmental models into one inclusive model. Typology theories suggest specific individual differences and characteristics that interact with the process of development (Widick et al., 1978a). Person-environment interaction, which has previously been described, combines the relationship of the student and environment.

This study will focus on theories related to the personological or individual differences model and the psychosocial cluster of student development. Specifically, Chickering's (1969) original and Chickering and Reisser's (1993) revisions of the psychosocial development theory will be utilized in the current research.

While several theorists agree as to the existence of developmental crises and movement through stages, there should be some caution in generalizing these assumptions. As Miller and Winston (1990) note, authorities differ on when and why a particular developmental change will likely occur in a person's life. One explanation of this disagreement is that development does not take place at exactly the same chronological time for everyone. Although the research appears to support the idea that "individuals experience common developmental tasks and progress through similar developmental processes and stages, the individual differences involved make it impossible to predict with even reasonable accuracy when a particular individual will face or deal with a particular developmental task, crisis, or stage" (Miller & Winston, 1990, p. 103). These individual differences should be taken into account when looking

at the point in which an individual deals with a certain developmental task, stage or crisis (Creamer, 1990).

When psychologists first began trying to understand the psychological development of individuals, they tended to focus on adults. Erik Erikson (1968, 1969) was the first to focus on adolescence as a separate developmental age needing its own definitions, with many psychosocial theorists using his research as a building block for further research. In his groundbreaking work, “Childhood and Society” (1969), Erikson proposes that development occurs in stages, with each stage containing specific tasks to be accomplished before moving on to the next stage. Erikson suggests that eight, age-related, sequential stages of development occur over one’s lifetime. Effective or ineffective resolution of the task influences one’s basic orientations or attitudes toward the world (Evans, 1996). The first three stages occur before the age of five: Trust versus Mistrust, Autonomy versus Shame and Doubt, and Initiative versus Guilt. The fourth stage, Industry versus Inferiority, is associated with childhood, typically elementary school age. The fifth and sixth stages, Identity versus Role Confusion and Intimacy versus Isolation are related to adolescence and young adulthood. The seventh stage, Generativity versus Stagnation occurs in middle adulthood and the eighth stage, Integrity versus Despair, arises in late adulthood.

Some of the major underlying assumptions of Erikson’s theory of development are that every individual progresses through the stages at a predetermined rate of readiness, the individual must be ready for progression to the next stage, society seems to expect a certain proper rate and sequence of development, each psychosocial strength

depends on the appropriate development in the proper sequence, and finally each of the parts of development are present before the actual stage takes place (Erikson, 1968, 1969). The conflicts experienced in each developmental stage are considered normal parts of growth.

While Erikson (1968, 1969) created the first developmental theory to address childhood and adolescence, he did not view the years of the typical college student as a separate entity, with its own definitions and developmental crises. Identity confusion and career indecision are significant issues of concern for the adolescent and the main developmental crisis following adolescence concerns intimate relationships. In fact, Erikson states that it is not until adolescence that individuals develop the necessary maturity and physiological, mental, and social growth to experience an identity crisis (1968).

It is possible to apply Erikson's theory to college age individuals. Students, who are of the traditional college age, are typically going through identity vs. role confusion stage of development, as defined in Erikson's theory (1968, 1969). The important identity issues are related to experimenting with roles and life-styles, as well as the ability to "make choices and experience the consequences, identify their talents, experience meaningful achievement, and find meaning in their lives" (Rodgers, 1990a, p. 123). Individuals in this stage range from about fourteen to twenty years of age. In addition, if identity issues are not resolved it may be difficult to develop mature intimacy in relationships, which in turn is a prerequisite for coming to a resolution of issues of

generativity versus stagnation, which start in one's early 40's. Because Erikson's work was focused on males, the application to females may be flawed.

### **College Student Psychosocial Development**

Keniston (1970) went on to propose that there was indeed a new stage of development somewhere between adolescence and adulthood and it was not reserved for a minority of creative individuals who did not have answers to the questions that seem to define adulthood. These questions relate to career choice, life-style and social role, and the relationship to society in general. He called this new stage *youth* (Keniston, 1970).

While Keniston (1970) agreed with many developmental theorists that psychological development involves the biological makeup of an individual, he proposed that "psychological development results from a complex interplay of constitutional givens (including the rates and phases of biological maturation) and the changing familial, social, educational, economic and political conditions that constitute the matrix in which children develop" (Keniston, 1970, p. 635). This new stage of development includes themes of constant tension between the self and society, expressed as ambivalence as well as estrangement and omnipotentiality, a rejection of prescribed roles of society, the beginning of identities specific to youth, and a value on constant movement and change (Keniston, 1970). Keniston does not group all college students into the developmental stage of youth, instead acknowledging that college students may actually be adolescents or young adults ranging in age from eighteen to thirty. Lastly,

Keniston reports that the developmental stage of youth cannot be equated with adopting youthful fashions, behavior, and speech or body movements.

Erikson and Keniston's work was important to initiate discussion about developmental stages separate from the development of an adult. Nevitt Sanford (1962) was the first theorist to further separate development into additional segments of time, giving college students their own developmental stage separate from child or adolescent and adult development. Sanford (1962) describes this unique period of development where the college student experiences challenging situations that need new methods of adaptive responses. His theory focused on the freshman college student and did not encompass the entire college experience. College students should be able to "tolerate ambiguity and open-endedness in himself while he is preparing for adult roles," not rush into adult roles and be patient in waiting for the adult roles to come along (Sanford, 1962, p. 281). Sanford (1962) emphasized the necessity to actually go through the entire developmental process of college, without taking short cuts. Acceptance of the "student" role and uncertainty about the future, including relationship and career paths are important developmental tasks.

### **Chickering's Theory of Psychosocial Development**

Arthur Chickering's (1969) seminal theory of student development is based on the work of Erikson and Sanford, and is one of the most respected and widely used theory describing college students' development (Taub, 1997). His landmark study of undergraduate students in thirteen small colleges appeared in 1969. Chickering (1969)

expanded on Erikson's ideas of identity and intimacy, and proposed that the principal concern during the traditional college years is establishing identity.

Chickering explains an assumption in developing the theory was that the "primary function of higher education is to encourage student development" (Thomas & Chickering, 1984, p. 393). The current research study uses his theory as the basis of psychosocial development because of its focus on college students.

Chickering initially proposed seven vectors of development that contribute to the formation of identity, in 1969. He used Erikson's view that development occurs in stages, although Chickering calls the stages vectors and he views vectors somewhat differently from stages. A vector has both force and direction, meaning that human development and change incorporates both a direction and a force.

Chickering (1969) and later Chickering and Reisser (1993), go on to explain that the vectors are not hierarchical in nature in that one can move in and out of the vectors during the college years, moving to higher vectors before fully developing a lower vector, as well as regressing to lower vectors to complete the necessary tasks associated with the vector. However, they are developmentally sequential, building on each other and leading to greater complexity, stability and integration. Some competence and progress must have been achieved in the management of emotions and developing autonomy before the establishment of one's identity can begin (Thomas & Chickering, 1984). The vectors can interact with one another, with students often finding themselves reexamining issues associated with vectors they have previously worked through (Chickering 1969; Chickering & Reisser, 1993). In addition, the latter vectors cannot be



accomplished satisfactorily until the earlier vectors have been addressed, with some progress being made. This is different from stage theories, where one stage must be mastered before one can move on to a higher stage.

Chickering does acknowledge that he based his initial theory on traditional age college students, eighteen to twenty-five years old and that additional research is needed regarding the application of his vectors to a wide variety of contexts and other combinations of students (Thomas & Chickering, 1984). Students move through the vectors at different rates and a student's cognitive, emotional, and social development are additional factors in the movement along the vectors. It is vital for college students to move through each of the vectors if they are to establish a self-identity (Chickering & Reisser, 1993; Thomas & Chickering, 1984).

It was Chickering's intention to merge existing evidence and theory into a guide of developmental changes that would establish a conceptual model that could span the continuum from understanding the college student as a developing being to bringing that understanding into educational practice (Widick, Parker, & Knefelkamp, 1978b; Theike, 1994). He wanted to "make information accessible to college and university faculty members so that they would have ways of thinking about how their educational programs could be organized to encourage such development in more systematic and powerful ways" (Thomas & Chickering, 1984, p. 393). The educational environment wields great influence that helps in moving students through the seven developmental vectors. That influence is generated through many structural factors such as clarity of "institutional objectives, institutional size, faculty-student interaction, curriculum,

teaching practices, diverse student communities, and student affairs programs and services” (Evans, 1996, p. 169; Theike, 1994, p. 5).

The original seven vectors from 1969 included: 1) developing competence, 2) managing emotions, 3) developing autonomy, 4) establishing identity, 5) freeing interpersonal relationships, 6) developing purpose, and 7) developing integrity. Typically, freshmen will be working through the first three vectors. While sophomores and juniors are most involved in the stage of “establishing identity,” seniors are commonly facing the last three stages or vectors.

Between 1969 and 1993, it became apparent through additional research with women and ethnic minority students’ that some revisions of Chickering’s theory needed to take place. The theory was subsequently revised in 1993, in order to incorporate new research findings and be more inclusive of various student populations, such as women students, ethnic minority students, lesbian, gay, bisexual, and transgender students (LGBTQA) (Chickering & Reisser, 1993). Chickering and Reisser found that some of the vectors actually needed to be altered somewhat and rearranged, due to changes in diversity of university populations as well as recent research. Following the revisions of Chickering and Reisser (1993), summaries of the seven amended vectors are:

1. Developing Competence – this vector concerns developing competence and confidence in intellectual, interpersonal, and physical and manual abilities.

2. Managing Emotions – this vector concerns developing the ability to acknowledge and accept, as well as to appropriately express and manage a full range of emotions, including what are commonly thought of as positive and negative emotions.
3. Moving Through Autonomy Toward Interdependence – this vector involves becoming relatively self-sufficient, responsible in achieving goals, and decreasing others influence of opinions. In addition, increased emotional independence, self-direction, problem-solving ability, persistence, mobility, in addition to the recognition and acceptance of the importance of interdependence are important components of this vector.
4. Developing Mature Interpersonal Relationships – this vector concerns developing tolerance and appreciation of individual differences, and the capacity for developing healthy and lasting intimacy in relationships.
5. Establishing Identity – this vector depends in part on the previous vectors. It concerns developing a positive self-identity, while acknowledging differences in others related to gender, ethnicity, and sexual orientation. Self-identity includes 1) comfort with the physical body and appearance; 2) comfort with gender and sexual orientation; 3) a sense of self in social and cultural heritage; 4) a clear sense of self with one's roles and lifestyle; 5) a sense of self, respective of feedback

from significant others; 6) self-acceptance and self-esteem; and 7) personal stability and unification.

6. Developing Purpose – this vector requires creating clear plans and priorities for integrating vocational and career goals, personal interests and activities, and establishing strong commitments with family and other interpersonal relationships.
7. Developing Integrity – this vector is a progression from uncompromising beliefs to a more humanized, personalized value system respectful and acknowledging of others beliefs, and finally moving to congruence of individual values and socially responsible behavior. (Chickering & Reisser, 1993)

### **Development Related to Women and Minority Students**

The resulting revisions to the theory, as previously noted, were due to the review and evaluation of research, especially related to the development of women and ethnic minority students. Initially, Chickering and Erikson (1993) thought that women simply had a difference in developmental patterns because they “confused identity with intimacy” (p. 23). Two studies critiqued Chickering’s theories within the context of female students and found significant differences in that women students need longer to resolve issues of autonomy (Straub, 1987; Straub & Rodgers 1986). In addition, Straub (1987) found that women and men develop autonomy differently. For women,

developing autonomy depends on how well they accomplish the freeing interpersonal relationship tasks.

In addition to the previous criticisms, Taub (1997) indicated that even in the 1993 revision of his theory, Chickering did not address the limitations of his theory in relation to women. Taub (1997) goes on to caution graduate programs and student affairs practitioners about the limitations of Chickering's theory, in light of new and emerging research in how the development of autonomy is applied to female students. Part of her discrepancy with Chickering's theory is that female student's close relationship with their family does not necessarily indicate problems with autonomy. However, like all research, this may not be absolutely accurate, as all female students do not have a close relationship with their family and each relationship is dependent on the context and makeup of the family. Straub and Rodgers (1986) go on to limit the alternative explanation of female student's differences in the development of autonomy by finding that those differences depend on sex role orientation, with female students described as androgynous or masculine following Chickering's timeline for autonomy development and female students described as feminine or undifferentiated score lower on independence and autonomy scales.

Straub (1987) goes even further stating there is more than one way to develop autonomy and suggested that women might need to develop autonomy in their relationships before they develop autonomy as a whole. So it seems that, according to several research studies, for some women the progress of development in autonomy depends on how they master developing the relationship task. Foubert, Nixon, Sisson,

and Barnes (2005) found female students to be more tolerant than their male peers, at the beginning of college and also throughout their college career. They also found female students to be more developmentally advanced in the mature interpersonal relationships vector, confirming prior research (Foubert, et al., 2005; Utterback, Spooner, Barbieri, & Fox, 1995; Greeley & Tinsley, 1988).

Josselson (1987) conducted additional research focused on female identity development. This research helped confirm that identity development was different for women and men. The women studied had a tendency to maintain connections to their family of origin, while they were forming and living their identities, whereas the men tended to separate from their family of origin. In addition, these women and men placed importance on different issues. The men tended to focus on issues such as religion, politics, and career while separating from their family. The women, on the other hand, were focused on sexual behavior, whom and when to marry, who to be friends with, and religious traditions, during this same time period (Rodgers, 1990b). As cited by Gilson (1990), Gilligan described identity development as “based on the creation and maintenance of relationships, rather than on the abstractions of commitment, justice, and autonomy hypothesized by Perry, Kohlberg, and Chickering” (p.6). The importance of understanding the potential developmental differences in men and women college students is apparent, especially when it has been ascertained that from 1990 to 2001, women have become a majority of the students enrolled at many colleges, both public and private (Thelin, 2003).

It is widely known that many research studies of college student development, utilized mainly White, middle-class males as participants, especially those studies conducted in the early years of research. While there is an increasing amount of research related to students of color and psychosocial development, many studies have focused on either African American or International students. The amount of research with Latino American, Asian American and Native American College students is still very much lacking. Chickering and Reisser (1993) acknowledged this disparity and used recent studies, with students of color, as resources in revising the theory.

In addition to women, differences in development have also been found in ethnic minority student populations regarding Chickering's theory of development. Pope (2000) discovered that there is a relationship between racial identity and psychosocial development and suggests that these students are using energy to develop their racial identity, sometimes at the detriment of focusing on their psychosocial development. Pope (2000) also found that within the racial groups of Black American, Asian American, and Latino American students there were differences in the Establishing and Clarifying Purpose vector, with Black American and Latino American students scoring higher than Asian American students.

Branch-Simpson (1984) specifically studied the development of Black students and compared the results to Chickering's vectors. While there were some similarities in Black students' psychosocial developmental tasks when compared to Chickering's vectors, there were differences in the development of Autonomy and Interpersonal Relationships. The Black students had a greater need to remain connected to their

family and other supportive people, than the students in Chickering's research. This impacted the Black student's development of Autonomy, but through their relationships with extended family members and their religious affiliation, Identity was achieved. Another important factor in Establishing Identity was the importance of having role models, comprised of either family members or prominent Black citizens (Rodgers, 1990b).

As previously stated, research regarding Chickering's theory and other non-white student population's is very limited. This lack of research should be addressed and studies conducted specifically with these student sub-groups. While Cass (1979) completed further research regarding the psychosocial development of the gay, lesbian, and bisexual college student populations, it is beyond the scope of the current study and therefore will not be addressed in an in-depth manner.

The research and references available about first generation college students and their experiences with psychosocial development is also extremely limited. The first generation college students appear to have lower persistence and graduation rates, than other students. Pike and Kuh (2005) studied how certain experiences affect the intellectual development and learning of first-generation and second-generation college students. They found that the lack of several aspects of the college experience negatively affect the success of the first-generation students. These aspects include a lower likelihood of living on-campus, a lack of strong relationships with faculty and other students, as well as lower levels of involvement in campus organizations and clubs. Overall these students were less engaged in college experiences (Pike & Kuh, 2005).



More research is needed to specifically assess the psychosocial development of first-generation college students. The current study attempts to address a portion of the gap in literature.

Since the creation of Chickering's seminal work in 1969 and the subsequent revision by Chickering and Reisser in 1993, there has been criticism of the theory. In evaluating the developmental theory of Chickering, Foubert, et al. (2005) found Chickering and Reisser's description of the vectors sequential nature, may need reconsideration. Additionally, Foubert, et al. (2005) indicate "development is not so much a series of steps or building blocks, but rather could be conceptualized differently, like horizontal movement along several rows of an abacus, where development is triggered by environmental factors" (p. 469-470).

### **Creativity**

With innovation receiving so much attention in all levels of education, including higher education, it would seem that creativity would receive the same attention. Creativity is a vital component of innovation, and as such, would appear to be a vital component of higher education. Bruner (1962) states that in preparing for the future, we must encourage creativity in children and students, because it is more difficult than ever before to define the future.

## **Definition of Creativity**

However, creativity is somewhat difficult to characterize, as there is still no agreement as to an accurate method of assessing or defining creativity. With much dissent as to the definition of creativity, understanding the literature available can be difficult. Part of the lack of agreement is due to the many different theoretical models about creative behavior.

Runco (2004) reviewed the literature on creativity and found that the research on creativity is diverse, can be organized in several different ways, and includes numerous and diverse applications. To add to the difficulty of defining and understanding, there appear to be seven methods of studying creativity (Morgan, Ponticell & Gordon, 2000; Plucker, Beghetto & Dow, 2004; Sternberg & Lubart, 1996). For example, MacKinnon (1962) described four strands that are used to categorize creativity research and Rhodes (1961) goes on to state that those four strands are actually intertwined.

Altman (1999) describes characteristics of creative individuals as a greater degree of personal openness, an internal locus of self-evaluation, perseverance, a tolerance for ambiguity, and a tendency toward abstract thought. Sternberg and Lubart (1996) define creativity as the capacity for producing both novel and appropriate work. Runco (2004) describes a change in direction of researching creativity, from a focus on creativity and intelligence or creativity and personality, to a rather broad and diverse breadth of research approaches related to creativity.

In addition to the multiple definitions and categories of the definition of creativity it has been proposed that there are six main methodologies used to study

creativity. The six main approaches used to study creativity include mystical, pragmatism, psychoanalytic, psychometric, cognitive, and social-personality (Morgan et al., 2000; Plucker et al., 2004; Sternberg & Lubart, 1996). These same researchers suggest that these six methodologies are also roadblocks to the study of creativity. There is also some support in the literature that these roadblocks actually exist and are a negative effect on creativity research (Sternberg & Lubart, 1996; Treffinger, Isaksen, & Dorval, 1996). However, Plucker et al. (2004) go on to suggest that little has been done to alleviate the roadblocks and that in fact they may contribute to the abundance of faulty beliefs about creativity and in turn limit the study and application of creativity research. Research in creativity can be categorized in an additional manner. Runco (2004) described a disciplinary framework, “organized by behavioral, biological, clinical, cognitive, developmental, historiometric, organizational, psychometric, and social perspectives” (p. 663-664).

Guilford, in his 1950 address to the American Psychological Association, described a vast failure to study the area of creativity. Some reasons for this neglect are difficulty in measuring creativity and an overemphasis on the study of learning and intelligence. Some of the reasons he gives for studying creativity have been mentioned previously in this study, the economic value of new ideas and the need for visionary leaders. He goes on to initially propose eight areas of divergent thinking or creativity and acknowledges there are different types of creative abilities, but focuses his hypothesis of creative abilities on scientists and inventors. These eight areas of creative abilities are: 1) sensitivity to problems, 2) fluency, 3) novelty, 4) flexibility of mind, 5)

analyzing ability, 6) reorganizing or redefinition of currently existing ideas, 7) degree of complexity, and 8) evaluation of ideas.

In 1962 MacKinnon proposed that clarity develops when researchers use one or more of four perspectives in which to operationally define creativity: personality, process, press (situation, context or environment), or product. In this context person is used to describe any information about the individual, such as personality, abilities, and behavior. The term process is applied to motivation, learning, perceiving, thinking and communicating and involves the processes individuals use in being creative (Rhodes, 1961). Press is described as how an individual relates to their environment and in turn that creativity results when certain kinds of forces impact a certain kind of person when they are growing up and developing. Product is described as the outcome of being creative, whether it is an idea, theory, invention, or artifact. All four perspectives are considered creative in nature.

Following Guilford's 1950 address to the American Psychological Association, according to Rhodes (1961), there was a surge of interest in researching creativity. Rhodes (1961) evaluated creativity research and found that there were 40 different definitions for the concept of creativity and that the definitions fell into the four categories, or four P's of creativity, described by MacKinnon (1962). In addition, Rhodes proposed that these four P's overlap, are intertwined and only in the unity and intertwining does creativity occur. This is perhaps the most common structure in studying creativity (Runco, 2004).

### **Torrance's Theory of Creativity**

E. Paul Torrance also acknowledged the four Ps, (Rhodes, 1961) person, process, product, and press as different ways in which to view the development of creativity.

Torrance subscribes to the process focus of creativity, due to his emphasis on the process of “learning, thinking, teaching, problem-solving, creative, development and other processes – even the personality processes” (Torrance, 1993, p. 232). He describes creativity “as the process of sensing difficulties, problems, gaps in information, missing elements, something askew; making guesses and formulating hypotheses about these deficiencies; evaluating and testing these guesses and hypotheses; possibly revising and retesting them; and, last, communicating the results” (Torrance, 1993, p. 233). In addition, Torrance elaborates on his choice of using the process focus of researching creativity, because ultimately the other three areas of personality, product, and press must be addressed within the process method. This goes against some of the criticism of Torrance's creativity research, that there must be an integrated method of studying creativity. Torrance described these methods long before it was popular.

Torrance developed a method of identifying creative potential making it possible to conduct research with everyday people, using “relatively simple verbal and figural tasks that involve divergent thinking plus other problem-solving skills” (Sternberg & Lubart, 1996, p. 680). He believed that creativity occurred in the domain of everyday life and is not limited to examples of extraordinary talent. Torrance's definition of creativity can be grouped in the psychometric category of studying creativity.

According to Torrance (1995), the tasks involved in the *Torrance Tests of Creative*

*Thinking* (TTCT) are “based on a rationale developed from some research finding concerning the nature of the creative process, the creative personality, or the conditions necessary for creative achievement” (p. 90).

Torrance (1995) designed the tasks that make up the TTCT in order to include “as many different aspects of verbal creative functioning as possible” (p. 90). The tasks of the TTCT are evaluated and then quantified for fluency, flexibility, originality, and elaboration (Torrance, 1974, 1995). Fluency is described as the number of related or relevant ideas. Flexibility is the number of different categories or the number of changes in thinking into which the responses can be placed. Originality is the number of statistically infrequent responses that vary from the obvious or common answers and “show creative intellectual energy” (Torrance, 1995, p. 90). Elaboration is described as the amount of detail or number of different ideas in the details of an idea (Torrance, 1995).

There have also been criticisms of this psychometric method of studying creativity. Sternberg and Lubart (1996) argued that the brief instrument is not an adequate measure of creativity. Amabile (1983) criticizes this method of studying creativity because fluency, flexibility, originality and elaboration do not represent the true nature of creativity. However, even with these arguments against Torrance’s methods and theories, the *Torrance Tests of Creative Thinking* is one of the most widely used instruments used to evaluate divergent thinking.

Kirton (1976) offers yet another theory of styles of creativity. He posits that there is actually a cognitive continuum of creativity, with innovators on one end and

adaptors on the other end. Innovators tend to create through working outside traditional systems and produce ideas that are outside of that system or paradigm. Adaptors, on the other hand, tend to work within a system or paradigm in order to improve it and the result is creativity. Kirton (1976) describes that within the continuum of innovators and adaptors; there can be both high and low creative individuals.

### **Creativity and College Students**

There appears to be a gap in both research on creativity and creativity itself, in higher education. There has been a great deal of interest in creativity in children, with less interest in adolescents and still less interest in adults. In fact there have been several studies investigating this lack of creativity in higher education. A review of the literature indicates that research with college students and creativity appears to be minimal. There was only one book available that was specifically related to creative college students, and it was published in 1968. Another important aspect of this limited amount of research is that while it appears to be quite antiquated, due to the year it was published, it seems to be prescient in how it describes the current state of higher education. It appears that the same issues and dilemmas are still present forty years later. The limited research that has been done specifically related to college students and creativity, indicate that some highly creative college students may not complete college, have academic difficulties in college, or change their major with higher frequency (Heist, 1968b).

Several studies look at creativity related to academic performance, divergent thinking skills, critical thinking skills or cognitive development. A brief review of the

literature on creativity and college students indicates that many of the available research can be placed into four categories: critical thinking skills, divergent thinking skills, personal traits and academic success or achievement.

Shallcross and Gawienowski (1989) described a symposium with over 400 creativity researchers present. Several ideas regarding gaps in creativity and higher education were discussed. They included a concern about how to measure creativity accurately in college students, the fact that the general public needs to understand the relationship between cultivating creative potential and promoting national competitiveness and enhancing national prestige, the fact that academic achievement does not equate creativity, and finally that promoting creative thinking is an important function of any institution of higher learning.

Soriano de Alencar (2001) described several obstacles that college students face in expressing creativity. She found that students expressed a need for the time and opportunity to be creative. In addition, students reported that they would be “more creative if the educational context would be more appropriate for the nurturance of creativity, as well as if they have had more opportunities to express their potential, more resources to realize their ideas, and if they have received more recognition for the creative work” (Soriano de Alencar, 2001, p. 138). Freedom and supportive academic environments are important for creativity to flourish (Soriano de Alencar, 2001; Barron, 1997; Cole, Sugioka & Yamagata-Lynch, 1999).

Even in 1968, MacKinnon was reporting that the best predictor of creative achievement in college is creative achievement in high school. He goes on to lament



that admission criteria for colleges rely on grades and standardized test scores, which do not indicate creativity. MacKinnon (1968) continues by concluding that “above a certain minimum level required for mastery of a field, being more intelligent does not guarantee a corresponding increase in creativeness” (p. 106). This is an interesting finding, since many definitions of giftedness include creativity as an important component.

Creative college students may have difficulty academically due to the structure of the college system. In fact, Brown (1962) stated, “creativity is penalized since the creative student is apt to give a highly original meaning to the question which in a machine-scored test or in the presence of a ‘by the book’ teacher will not be scored correctly or appreciatively” (p. 539). It appears that the system of grading and the emphasis on achievement may penalize highly creative students. The students who make the best grades do not appear to have characteristics that are common of many creative students. Trent has described creative people as independent and innovative, playing with ideas and concepts, open to a wide range of experiences, somewhat rebellious, spontaneous, flexible, and “not necessarily the greatest “achievers,” insofar as grade-point average measures achievement” (Heist, 1968a, p. 5).

The high academic achievers have much different characteristics and tend to be conformists, compulsive, rigid, and more insecure than those who make lower grades (Axelrod, 1968). The lack of personal relationships between student and faculty member, the traditional grading system which is ingrained in most college campuses and the highly structured environment of the college environment can harm the creative student more than other types of students. The creative students may become bored with

the inflexibility of the college curriculum and decide to give up or feel their creativity is not being challenged in the academic requirements of college.

MacKinnon (1968) reaffirms the concern that many specialized programs, such as honors seminars, independent study projects and research programs may not be available to the very students who would benefit the most, the highly creative student. This is mainly because the creative students do not always attain the highest grades and these programs are often restricted to those deemed academically talented.

Some of the blocks to creativity can also harm personal growth, fulfillment, and effective coping skills (Barron, 1988; Carson & Runco, 1999; Dowd, 1989; Schubert, 1988). Examples of these blocks can include fear of failure; preoccupation with order and tradition; resource myopia (not recognizing one's own and others strengths); dogmatism or inflexibility; over certainty and persistence in behavior that no longer works; a reluctance to exert influence (to not seem overly pushy; a "don't rock the boat" attitude); a fear of play; desire to not appear foolish; fatigue, burn-out or exhaustion; lack of humor or appreciation of humor; squelching of 'What if?' thinking and fantasizing; and fear of allowing the imagination to roam (Carson and Runco, 1999, p. 185).

Additional problems can lead to blocks in creativity and coping, which can be consistent with what is going on with college students. These additional issues are preoccupation with private worries and insecurities, environmental restraints (e.g., at home, school, or work), movement toward premature closure and a tendency to analyze rather than synthesize (Carson & Runco, 1999). Many college students experience these blocks as a result of the academic requirements, the college environment, and their own

psychosocial development. This is one reason why creativity and psychosocial development were considered together in this study.

The choice of major or discipline may also impact the freedom allowed to students. Heist and Wilson (1968), go on to speculate that highly creative students will be drawn to certain disciplines and not to others. It seems that if the creative needs are not being met by a certain academic discipline, the student will likely change to a different area that better meets their needs or may, in fact, leave the institution altogether. However, Schubert (1988) found that more creative students might be less likely to embrace conformity and social pressure. In addition, Schubert (1988) reports that when coping ability and creativity were investigated utilizing Guilford's creativity tests and the Minnesota Multiphasic Personality Inventory with college undergraduate students, the more creative students were less likely to fail academically or drop out of college. These findings were in stark contrast to Heist's research in 1968 (Heist, 1968b).

Even the participation in honors programs or independent study does not necessarily equate to the freedom and opportunities for expression that the creative student craves and needs. This appeared to be due to "a larger dose of conventional course work – the difference being only quantitative instead of qualitative" (Heist & Wilson, 1968, p. 194). Even the small liberal arts colleges experience attrition of creative students. Heist and Wilson (1968) propose that this may be due to the overt and covert goals the institution has for the students, such as meeting certain academic standards, achieving high grades. However, these concerns may be abating somewhat due to the recent emphasis on educating the innovators of the future.

Carson and Runco (1999) go on to describe several ways that the educational environment can improve creative thinking. Four areas have been described as important in fostering creativity in the college environment; assessment, openness and freedom of choice, classroom activities and a personal relationship between student and faculty (Cole et al., 1999). However, these features may not be present, even in honors program courses. Ideally colleges would expose students to new ideas, theories and philosophies, but the institutions may not be effective due to a lack of emphasis on creative thought, resulting in potential problems and dilemmas for institutions of higher education (Sanford, 1962).

In particular, a positive relationship between teachers and students encourage active learning in the classroom, which in turn can help to foster creativity (Morganett, 1991). In addition, the relationship between teachers and students are very important to the psychosocial development of college students regardless of the context (Pascarella, 1980; Terenzini & Pascarella, 1980, 1991). Problems associated with developing positive relationships between faculty and creative college students result from the expectations that students will possess certain attributes as well as risks the students must take to express creativity in the classroom (Cole et al., 1999).

This research project will use Torrance's definition of creativity. It has several components that fit well with the examination of college student psychosocial development. Examples of these components are a tolerance for ambiguity, problem solving processes, problem-finding abilities, and motivation for creativity (Plucker, Beghetto & Dow, 2004). Torrance also encourages and expands on Wallace's (1926)

use of incubation in the process of solving problems, where “the creator leaves the problem, but continues to consider it subconsciously” (Cole et al., 1999, p. 282). The use of the incubation process may be very useful for college students but not always possible to utilize, due to deadlines and time-constraints.

### **Honors Programs**

Austin (1975) describes “Honors” as “the total set of ways by which an academic institution attempts to meet the educational needs of its ablest and most highly motivated students” (p. 160). Austin (1975) goes on to explain that Honors programs are “a planned set of arrangements to serve the needs of talented students more adequately than if the matter were left entirely to the initiative of interested persons” (p. 160). There is a lack of available literature about people who are academically talented and between the ages of seventeen and twenty-two (Rinn & Plucker, 2004). A review of the literature reveals that much of the research done regarding Honors programs relates to descriptions of different Honors programs, specific components of honors programming, and academic or other intellectual abilities of Honors students (Rinn & Plucker, 2004). In fact, attempts to evaluate Honors programs on their effectiveness on the institutions and students, either while they are in college or after graduation are very rare (Long, 2002; Randall & Spiller, 1985; Reihman, Varhus, & Whipple, 1990). To gain a better understanding of the current dynamics of Honors programs and their significance in institutions of higher education, it is important to develop an understanding of their history.

## **History of Honors Programs**

The foundation of the modern Honors programs lies with the Socratic tradition, the tutorial system of Oxford and Cambridge, and the German seminar approaches to education. It is generally accepted that Frank Aydelotte initiated the Honors study movement in the United States. In 1922 he established an inventive pass-honors program at Swarthmore College. He based it on the Oxford pass/honors system, which emphasized the study of Greek and Latin Classics. As Aydelotte (1944) points out, “exact knowledge of a certain set of books and topics, coupled with the capacity to deal in broad generalities with a wide range of historical and literary material” (p. 23), became the basis of honors study. In some programs traditional grading practices and attendance policies were deemphasized and “the exploratory dimension of the honors experience” was emphasized (Cummings, 1986, p. 20). Aydelotte published his seminal work, “Honors Courses in American Colleges and Universities”, in 1925, which served to extend the honors philosophy to other universities (Austin, 1986). Aydelotte’s work related to the honors philosophy and Pressey’s writings associated with the psychology of education for superior students continued the dialogue on honors education in institutions of higher education (Shushok, 2003). From that time, colleges and universities have initiated their own method of an honors education program (Austin, 1975, 1986).

The initial honors programs were mainly implemented in private, Eastern colleges. According to Cohen (1966), while it was possible to find a few Honors programs at public colleges and universities, it is only since 1957 that a coordinated and

systematic effort expanded the Honors programs to large, public and private universities. The launching of Sputnik, by the Soviet Union, in 1957 brought to light the need for increased emphasis on fostering talent. The result of Sputnik in 1957 and the subsequent fear of the Soviet Union's potential power in the world, made "that year pivotal for the development of honors programs" (Austin, 1986, p. 6). The United States placed renewed emphasis on programs that would promote superior scholarly activity and ultimately work to continue the U.S.'s status as world leader in innovation.

In 1957 Joseph W. Cohen founded the Inter-University Committee on the Superior Student (ICSS), which helped to initiate interest in honors across the United States (Austin, 1975, 1986; Cohen, 1966). Cohen has been deemed the "modern Johnny Appleseed sowing interest in honors across the nation" (Austin, 1975, p. 161). The initial conference steering committee of the ICSS developed philosophical and administrative guidelines for the meaning of "honors" called "The Sixteen Major Features of a Full Honors Program" (Cohen, 1966, p. 30). The importance of this document should be underscored because, although minor changes and revisions have taken place, it still remains the measure to which most honors programs are currently held (Marriner, 2006). The National Collegiate Honors Council (NCHC) succeeded the ICSS, in 1966. The NCHC remains the chief national organization of honors program administrators, faculty, and staff.

The 1960's and 1970's were marked by the civil rights movement and a move toward equality in education, resulted in college administrators shifting towards "experimental college" in an effort to dissuade the idea that honors programs were elitist

(Cummings, 1986). In addition, colleges and universities helped to quiet the elitist charges by responding “that both democratic and educational principles require not that the same programs be offered to all but that all persons have the opportunity to develop their talents to the fullest” (Austin, 1986, p.7). The Honors programs of the 1980’s emphasized improving the quality of education, which helped calm critics and boost support of Honors programs as higher education looked for ways to foster the abilities of superior or gifted students (Cummings, 1986).

The late 1950’s to the 1970’s brought about significant re-evaluation of the value of Honors programs. There was a shift away from the private liberal arts college, which had been the typical setting of Honors programs, to the state universities. In addition, Honors programs became distinct organizational systems and “institution-wide programs for students from all levels and majors” (Galinova, 2005, p. 31). The late 1970’s and early 1980’s saw a large increase in the number of new Honors programs being established in local state and community colleges.

The 1980’s and 1990’s saw increasing numbers of institutions of higher education shifting Honors programs to Honors colleges. The creation of an Honors college, as compared to an Honors program, brought greater visibility, increased autonomy, different academic policies, and private gifts from alumni and benefactors, as well as enhanced influence over policies related to Honors students (Galinova, 2005). In addition, the 1980’s were the start of the “institutionalization of honors programs as a universal organizational structure in American higher education” (Galinova, 2005, p. 51). The “fully developed” Honors program concept was embraced and fully



institutionalized by many in the honors education community, when in 1994, the NCHC Executive Committee revised and approved text listing characteristics of this kind of program (NCHC, 2007).

### **Current Honors Programs**

Honors programs are increasing in popularity and importance in many U.S. institutions of higher education. They are now being seen in nearly all types of college and university, including the local community college as well as Research I University (Austin, 1986; Long, 2002). Most Honors programs appear to be less than twenty years old, and nearly one-third of the programs are less than ten years old (Long, 2002).

Honors programs have been a way for colleges and universities to compete for a tightened pool of academically talented students (Long, 2002). One explanation for this is that these students' achievements bring notoriety and "help to improve an institution's academic atmosphere and differentiate a university from its peer institutions" (Rinn & Plucker, 2004, p. 54). In addition, the influence of the ranking system has increased competition between schools (Long, 2002). As a result, more and more resources are being poured into Honors programs.

Because Honors programs, like colleges and universities, began in response to the differing needs of differing groups of individuals, there are no two programs exactly alike (Bhatia, 1977; Randall & Spiller, 1985). Honors programming can range from general Honors programs that are university wide to experimental Honors programs, with examples of Honors contract courses, Honors seminars, departmental Honors

programs, two-year college Honors programs, and four-year Honors programs being available across the United States (Rinn, 2003). Typical Honors programs utilize advising and counseling as services offered and the most common purpose is “to stretch, strengthen, and stimulate superior students” (Randall & Spiller, 1985, p. 29). Currently, Honors programs have incorporated co-curricular activities and experiences, such as community service, service learning and community building, into the earlier singular academic focus.

The increasing popularity of Honors programs has not been without criticism. Charges of elitism can be found with the creation of an Honors college at the University of Massachusetts, which has resulted in a backlash and rejection by the very students who are eligible to participate (Healy, 2000). Additional criticism results from the cost of the programs, increased number of faculty, difference in mission of public institutions of higher education, and a lack of diversity (Healy, 2000; Long, 2002; Associated Press, 2004).

### **Selection of Honors Students**

According to Robert Kiltgaard (Jenkins-Friedman, 1986), there are four policy decisions that need to be made in selecting students for Honors programs. The first, the purpose of admission relates to whether the goal of the selection of the student is to increase diversity, advance leaders of the future, and encourage achievement of high status careers for the students, foster future creativity, or some other rationale. The second policy decision concern the information that should be collected in screening

students for honors programs. The third policy related decision is the choice of talent characteristics emphasized in the student's selection. Finally, the fourth policy decision in admissions is weight given to different identification data, including psychometric data, behavioral data, and developmental data. If Honors programs are to defend their admission criteria, all four of the policy decisions should be addressed adequately (Jenkins-Friedman, 1986).

Traditionally, selecting and defining honors students relied heavily on standardized test scores, such as the ACT and SAT, and high school grades. However, there have been suggestions that additional methods are needed in order to admit qualified students who may have been underachieving in high school (Austin, 1975). Possible methods include a combination of psychometric (standardized test scores), behavioral (extracurricular activities), and developmental (essays or teacher recommendations) methods (Jenkins-Friedman, 1986). In fact, Jenkins-Friedman (1986) has been critical of admission criteria that rely primarily on intellectual ability because this method systematically denies some of the most gifted students the opportunity to participate in honors education. There have been warnings against the sole use of academic standards or test scores in admission to Honors programs and results in overlooking important criteria such as motivation and possibly discriminating against students who may have the most potential for distinguished achievement (Austin, 1975; Holland, 2001; Jenkins-Friedman, 1986; Renzulli, 1978; Robinson, 1997).

Hoyt (1965) conducted an extensive review of the available literature on traditional measures of academic success and post-college achievement in a variety of

career fields. There was virtually no correlation between academic success and a range of indications of success in the adult world. Further, it was determined there was good reason to believe that academic achievement or knowledge, as well as other types of educational growth, and development are fairly unrelated to each other (Hoyt, 1965).

### **Honors Programs' Relationship to Giftedness**

The literature seems to equate high ability college students with Honors programs, providing descriptions of and a rationale for honors programs (Long, 2002; Rinn & Plucker, 2004). The establishment of honors systems appears to be one way to foster the development of especially gifted and talented students. Gifted programs in college tend to be housed in Honors Programs or Honors Colleges.

It is assumed that many of the participants in Honors programs have participated in gifted education programs at the elementary and secondary school levels. Rinn and Plucker (2004) stated, “gifted college students are typically defined as those students belonging to an honors program or honors college at the collegiate level” (p. 54). In 1972 the Marland Report, produced by the United States Office of Education, included creativity as an area of identification in gifted and talented education. Renzulli (1978) defines gifted characteristics, which one can in turn apply to college Honors students, includes the interaction among three groups of traits – “above-average but not necessarily superior general abilities, task commitment, and creativity” (p. 184). All three groups of traits should be considered when selecting students for special programs.

Selection of creative gifted students into Honors programs is an important consideration. The definition of giftedness has expanded to include creativity as a component, as far as K-12 gifted and talented programs are concerned. However, including creativity in Honors program selection procedures is difficult due to previously addressed concerns, including difficulty in identifying creativity, reliance on one test score to indicate creativity, and a lack of agreed on definition of creativity. Jenkins-Friedman (1986) recommends the use of Renzulli's model of giftedness in selecting students for Honors programs and suggests broadening the selection criteria to include more creative students who may have less prestigious academic records than the traditional honors student. Further, Jenkins-Friedman (1986) highlights the role of motivation, or task commitment, in the success of both creative and Honors students.

McCabe (1991) states, "although high levels of creativity may be associated with high levels of academic performance, this role is not a causative one" (p. 122). And in fact, McCabe's (1991) study indicates that the students with high measures of intelligence and high measures of creativity perform best, especially in English. But, with no accurate method of measuring college student's creativity and academic achievement or SAT scores being the main admission method into Honors Programs, many truly creative college students may not be accurately represented in college Honors Programs. It is also apparent that many Honors programs base admission on standardized test scores, such as the Scholastic Aptitude Test (SAT) or American College Testing (ACT), high school grade point average, extracurricular activities, community service, and recommendation letters (Mathiasen, 1985).

For the purposes of the current study, it is not vital to belabor the concept of giftedness. It is however, important to understand that creativity is an important concept within the definition of giftedness. In addition, because collegiate Honors programs generally rely on some of the same entrance criteria as K-12 gifted programs, creativity may not be assessed fully nor appreciated as an important component of part of Honors programs. A lack of research related to Honors programs and their outcomes as well as characteristics of college level gifted students has been noted in the literature (Long & Lange, 2002; Rinn & Plucker, 2004; Robinson, 1997).

### **Honors Students Compared to Non-Honors Students**

There have been several studies about the characteristics of academically superior, gifted or Honors students. One of the objectives of the current study is to contribute to the literature about the differences between Honors students and non-Honors students. Assumptions about Honors students' advancement in areas outside of academic abilities should be limited, because while these students are advanced in some areas they may not be more mature than their non-Honors counterparts and may not exhibit advanced levels of psychosocial development (Harte, 1994; Shepherd Johnson, 1995).

Kodman (1984) found traits that appear to be characteristic of academically superior students and that these traits are not necessarily viewed as healthy or desirable. He reported that previous studies by Terman (1925) and others are less than perfect and lacking in state of the art personality measures. Personality characteristics that tend to

have negative connotations are: “compulsive, perfectionistic, insecure, immature, obsessional, inadequate, seclusive, and stubborn” (Kodman, 1984, p. 137). Examples of more positive traits include: “frank, kind, aesthetic, clear thinking, idealistic, and sentimental” (Kodman, 1984, p. 138). Honors students seem to be academically motivated and achievement oriented, as well having strong needs for approval and autonomy (Day, 1995; Hickson & Driskill, 1970; Mathiasen, 1985). In addition, Honors students are confident in making decisions, independent, diligent, and desire praise (Mathiasen, 1985).

Studies found that gifted college students were actually less well adjusted in personality factors, than their non-gifted counterparts (Chambers & Dusseault, 1972; Tomlinson-Keasey & Smith-Winberry, 1983). According to Tomlinson-Keasey and Smith-Winberry (1983), some of the lack of adjustment of the gifted college students may be attributable to performance expectations in college. They also note a difference in the development of men and women gifted students, determining that the men gifted students are less well adjusted than the norm. They found that the women students were better adjusted than the norm. This same study also noted a previously noted phenomenon, that women gifted have lower levels of achievement than their male counterparts (Day, 1989; Shepherd Johnson, 1995; Tomlinson-Keasey & Smith-Winberry, 1983). Canter (1979) has hypothesized that the women are hampered by lower occupational and educational aspirations, which may limit performance by the women not participating in or avoiding opportunities for achievement. Many gifted or academically talented college students may experience a downward trajectory, may not

realize their full potential, and women are especially at risk of choosing lower ambitions (Alvarez Harvey, 1986; Robinson, 1997; Shepherd Johnson, 1995). One negative potential for Honors students is ambivalence about success and achievement, therefore avoiding either success or failure (Hoffman, 1974).

Some challenges that women Honors students experience are also present in minority Honors students. While women comprise about half of the Honors students, minority students, including blacks, Hispanics and Native Americans, comprise a very small proportionate number of Honors students (Alvarez Harvey, 1986). This is the case; in spite of the concerted efforts colleges have made to recruit highly talented racial and ethnic minority students. The one exception is the large number of students who join honors programs at historically black colleges, where the programs are available (Alvarez Harvey, 1986).

While previously mentioned research has pointed to significant differences in Honors students and non-Honors students, Shepherd Johnson (1995) did not find significant developmental differences in the academically talented and average ability students. In addition, it was found that the academically talented students were not more academically focused than their peers (Shepherd Johnson, 1995). This seems counterintuitive to what might be expected of this group of students. The one main difference this study found, in the academically talented students and average ability students was grades. The academically talented students had higher grades, while not being more academically focused (Shepherd Johnson, 1995). Research indicates a need for further research of student development theory with subgroups of college populations



and recommends additional research with academically talented college students look at how specific intervention programs, such as Honors programs, affect the student's development (Shepherd Johnson, 1995; Day, 1989; Long & Lange, 2002).

Several studies indicate that there are similarities in personality characteristics of both college Honors students and those who are identified as creative. Day (1995) reports that college honors students need to experience a friendship with faculty, which is also important to creative college students (Axelrod, 1968). In fact, Day (1995) includes creativity itself as a characteristic of Honors students. However, not all Honors students exhibit creative characteristics. In fact, Bednar and Parker (1965) determined that Honors students did not show higher levels of creativity than non-Honors students. The problem of retaining both creative and Honors college students has been restated, and is an area in need of attention (Day, 1995; Heist, 1968b). This appears to make understanding this subpopulation of college students even more important and vital to all constituents of higher education.

### **Current University Honors Program**

The 28<sup>th</sup> edition of the University Honors Handbook describes the Honors program at the university used in the current study. The honors program was initiated in the 1960's, in what was the College of Arts and Sciences. By 1968 all academic colleges were united in the effort to provide a university-wide Honors programs. In addition to the University Honors Program, students may choose to participate in several

academic honors programs offered in some colleges and several departmental Honors Study Sequences (Texas A&M University Honors Program, 2007).

Currently, there are over 300 courses offered, with the honors designation, and more than 2,500 undergraduate students participating. Selection for these Honors programs is determinant on grade point ratio (GPR), high-school rank, SAT/ACT score, or National Merit Finalist, National Achievement Finalist, or National Hispanic Scholar designation. Students are required to maintain a certain grade point ratio for continued participation in the program. The program is fairly flexible as students have the option of meeting the Honors program requirements through honors courses, Course Contracts, Independent Study, the University Undergraduate Research Fellows Program, or to graduate level courses taken as honors credit. As is the case in all Honors programs, not all students who are eligible for participation take part in the Honors program.

### **Summary of the Literature**

This review of the literature provided an overview of some of the most important research that impacts the current study. The history of higher education in the United States provided a better understanding of the evolution of student development theory. Chickering's Theory of College Student Development was described and reviewed in this chapter, in relation to supporting research and criticism of gaps in describing the development of certain groups of college students.

In addition, a survey of the literature describing creativity and the relationship to college students was described. There was a consensus among researchers as to the lack of studies related to creativity and college students.

The available research was evaluated relating to college and university Honors programs. This review confirmed the lack of research conducted with college Honors students, or gifted students, and supports the need for additional research about both Honors students and the outcomes of Honors programs themselves. The question remains whether Honors students are more creative and have higher levels of psychosocial development than Non-honors students.

## CHAPTER III

### METHODOLOGY

The main objectives of this study were to: (1) determine any statistically significant differences in college honors and non-honors students on measures of creative thinking abilities (Torrance, 1974); (2) determine any statistically significant differences in college honors and non-honors students on measures of psychosocial development (Chickering, 1969; Chickering & Reisser, 1993); and (3) explain any relationships between creativity and psychosocial development. In addition to creativity and psychosocial development scores, demographic and academic background data were also collected in order to determine any interaction effects and further inform the research.

Included in the first section of this chapter is a description of the participants, including the selection procedures utilized and their demographic information. The second section provides an explanation of the instruments employed in the current study. The procedures used in collecting the data are described in section three. Section four contains a summary of and procedures involved in the data set preparation. Finally, the methods of statistical analyses are described in the last section of the chapter.

#### **Participants**

The study participants were 298 college students attending Texas A&M University, a large, public, Carnegie classification “Comprehensive Doctoral/Research Extensive” institution located in the Southwestern United States. The University had a

total enrollment of 41,591 during the time the study took place. Participating students were enrolled in one of four different courses in which the testing took place, two of which were in the Department of Educational Psychology and two courses were different sections of a Department of Architecture course. The courses utilized provided access to both honors and non-honors students who represented a wide variety of backgrounds.

Permission to test the students was obtained through the faculty member teaching the course, prior to testing. All participants were asked to complete a consent form indicating their understanding of the purpose of the research study and their voluntary agreement to participate in the study. A copy of the consent form is available in Appendix A.

The initial participant group consisted of 140 Males and 158 Females, with identified ethnicity of 75% Caucasian, 8% Hispanic, 3% Asian, 2% African-American, 1% Bi-racial, .6% Native American and 9% “other” or who did not identify their ethnicity. There were 175 students classified as Honors Program participants and 123 classified as Non-Honors Program participants. The ages of these participants ranged from 17 to 30, with the majority falling in the range of the “traditional” undergraduate student, or 17 to 24 years of age. All University academic classifications were represented, including freshman, sophomore, junior and senior classifications.

During the preparation of the data set, the removal of several cases in the initial sample became necessary. These procedures are described in the Data Set Preparation

section of this chapter. The resulting data set had an “n” of 284. The removal of these cases resulted in some slight differences in the frequencies of participant characteristics. Of the resulting 284 participants, 42.3% (120) were Honors Program participants and 57.7% (164) were Non-Honors Program participants. Participant ages ranged from 18 to 29. Ethnicity classifications included 79.7% White participants, 8.7% Hispanic participants, 4.5% Asian participants and an additional 6.8% making up the “Other” category.

## **Measures**

In order to determine differences in creativity and psychosocial development measures, two formally developed instruments and an additional question form were utilized in the current study. The instruments were selected based on their availability, ease of use, as well as their relationship to the literature, as described in the previous chapter.

### **Torrance Tests of Creative Thinking**

Creative abilities were assessed using the *Torrance Tests of Creative Thinking* (TTCT), Verbal Test, Form B, Activities 4 and 5. The TTCT measures creative thinking abilities and includes two components: figural and verbal with equivalent forms A and B. Activity 4, entitled “Product Improvement of a Stuffed Toy Monkey” is viewed as “one of the most dependable measures” of creative thinking. The activity includes “a high degree of face validity”, which means that when examined by non-experts it

appears to test what it is intended to test, i.e. creative thinking (Torrance, 2000, p. 3). Activity 5 is entitled “Unusual Uses of Tin Cans”. Activities 4 and 5 have been used in concert in several studies of creative thinking.

Designed by E. Paul Torrance, from 1966 to 1974, the tests are based on Torrance’s operational definition of creativity. The tests can be scored by the Scholastic Testing Service, Inc. professional scoring service, with approximately a two to four week turnaround, or individual researchers can score the tests locally. In the current study, the scoring service was used. The tests are appropriate for children aged 5 through graduate students. Conducting educational research is a particular strength of the tests (Treffinger, 1985).

The TTCT are the most extensively researched and widely used instruments available for assessing creative thinking abilities (Treffinger, 1985; Callahan, 1991). Scores on the TTCT “represent only certain creative thinking abilities” (Treffinger, 1985, p. 1634) and are not intended to measure the entire construct of creativity. Test scores of the verbal form are provided on scales of fluency, flexibility, and originality. Fluency is the ability to produce numerous possible solutions to problems. Flexibility is the ability to use a variety of approaches, and originality is the ability to produce uncommon responses (Torrance, Ball & Safter, 1992).

One focus of the reliability of the TTCT is inter/intrascorer reliability of scoring, which assists in explaining whether inconsistencies exist between the scorers of the test. Another focus of reliability encompasses test-retest reliability. Rosenthal, DeMars, Stilwell, and Graybeal (1983) found that when trained scorers are used, interrater or

between scorer reliability coefficients are .90 or higher. Untrained scorers have attained mean reliability coefficients of .94 for originality and .99 for fluency in the verbal tests. Test-retest reliability coefficients range from .60 to .80 (Haensly & Torrance, 1990). Treffinger (1985) indicates that the TTCT exhibits reasonable reliability for use with groups and in research applications.

Validity of the TTCT has been addressed in numerous studies and in a variety of ways. While Chase (1985) suggests that the TTCT is lacking in construct validity, the Research Review for the *Torrance Tests of Creative Thinking, Figural and Verbal Forms A and B* (Torrance, 2000) provides information from numerous studies suggesting construct validity is measured by testing behaviors which are consistent in the literature about creative behaviors. Treffinger (1985) indicates that the TTCT predictive validity “have been positively and significantly correlated with creative achievement criteria in several studies involving periods as short as nine months and as long as 22 years” (1985, p.1633). Further information on predictive validity provided by two longitudinal studies over twenty-two years with a group of elementary school children indicate an overall validity coefficient of .63.

### **Student Development Task and Lifestyle Assessment**

Student psychosocial development data was collected using the *Student Development Task and Lifestyle Assessment* (SDTLA), Form 1.99 (Winston, Miller, and Cooper, 1999b). Based on the work of Chickering (1969) and Chickering and Reisser (1993), the SDTLA is used in understanding and assessing the psychosocial



development of college students. This instrument assesses three of Chickering's seven developmental vectors: 1) Developing Purpose, 2) Developing Mature Interpersonal Relationships, and 3) Moving Through Autonomy Towards Interdependence. The SDTLA was chosen for this study due to its theoretical foundation, the ease of use and the availability of the instrument. The form used in the current study consists of 153 items assessing three developmental tasks; ten subtasks and two scales and answers are provided on a scan-tron form. The Office of Institutional Research at Appalachian State University, which has distribution authority from the test authors, completed scoring.

The SDTLA is an extensive revision of the *Student Development Task and Lifestyle Inventory (SDTLI)* (Winston, Miller, & Prince, 1987) in order to include recent research concerning women, minorities and homosexual students. It is based on principles of human development, specifically those of developmental task achievement occurring in a college setting. Developmental tasks are defined as an interrelated set of behaviors and attitudes that the culture specifies should be exhibited at approximately the same time by a stated age group within a designated context (Winston, Miller, & Cooper, 1999a). For the SDTLA, that context is higher education. If the challenges of a developmental task are not met, students may encounter a lack of continued development, social disapproval or personal adjustment difficulties.

The SDTLA includes measurement of three developmental tasks: (1) Establishing and Clarifying Purpose, (2) Developing Autonomy, and (3) Developing Mature Interpersonal Relationships. Each developmental task is further defined by subtasks. The Salubrious Lifestyle (SL) and Response Bias (RB) scales are also

included in the SDTLA, but may not be influenced by participation in higher education experiences.

The Establishing and Clarifying Purpose Task (PUR) contains four subtasks: Educational Involvement (EI), Career Planning (CP), Lifestyle Planning (LP), and Cultural Participation (CUP). The Developing Autonomy Task (AUT) is composed of four subtasks: Emotional Autonomy (EA), Interdependence (IND), Academic Autonomy (AA), and Instrumental Autonomy (IA). The third task of Developing Mature Relationships (MIR) includes two subtasks: Peer Relationships (PR) and Tolerance (TOL). Winston, Miller, and Cooper (1999) provide the following descriptions of the SDTLA tasks, subtasks, and scales, as explained in the Preliminary Technical Manual:

- A. Establishing and Clarifying Purpose Task (PUR) - Students who attain high achievement on this task (a) have well-defined and carefully explored educational goals and plans and are active, self-directed learners, (b) have integrated knowledge about themselves and the world of work into suitable career plans, making the emotional commitment to and taking the appropriate steps now in order to realize those career goals; (c) have created a personal direction in their lives and made plans for their futures that account for personal, ethical, and religious values, future family plans, and vocational and educational objectives; and (d) display a wide range of cultural interests and actively participate in both traditional and non-traditional cultural events.

1. Educational Involvement Subtask (EI) - Students who have accomplished this subtask have well-defined educational goals and plans, have based their choice of major both on his/her abilities and a compatibility with those abilities, are knowledgeable about the academic resources available, and are actively engaged in the academic life of the college/university.
2. Career Planning Subtask (CP) – Students who have achieved this subtask have an awareness of the working world, an accurate understanding of their individual abilities and limitations, knowledge of the skills required for various occupations, a correct understanding of the emotional and educational demands of different kinds of jobs, and understand the steps needed to achieve the career goals.
3. Lifestyle Planning Subtask (SP) – Achievement of this subtask includes establishing a personal direction and orientation in one’s life, including personal, ethical, and religious values, future relationship/family, and vocational and educational objectives, as well as understanding how these values fit into the overall goals.
4. Cultural Participation Subtask (CP) – Students who have accomplished this subtask are actively involved in a wide variety of activities, including participating in or attending traditional cultural events such as plays, ballets, museums, art exhibits, and classical music concerts, as well as non-traditional forms of expression and ethnic celebrations and performances.

- B. Developing Autonomy Task (AUT) – Students who have achieved this task: (a) are able to meet their own needs and take action on their personal ideas, without the need for continual encouragement from others; (b) can structure their lives and influence their environment in ways that allow them to fulfill their daily needs and meet personal responsibilities without a great deal of direction or support from others; (c) structure their time effectively and create and implement effective study strategies in order to meet academic expectations without direction from others; and (d) recognize the mutual quality of an individual's relationship with his/her community and acts accordingly with responsibility making useful contributions.
1. Emotional Autonomy Subtask (EA) – Students who have realized this subtask do not need continuous reassurance and approval from others, are confident in his/her abilities, trust their own ideas and are confident enough to speak up in groups, even if opposition is present.
  2. Interdependence Subtask (IND) – Students who have high scores on this subtask understand the shared nature of their relationship with his/her community, possessing a concern for others and the community and participation in the community as a whole.
  3. Academic Autonomy Subtask (AA) – Students who have accomplished this task have the ability to deal well with a certain amount of ambiguity,

possess effective study and time management skills, and do not need a great deal of direction regarding their academic endeavors.

4. Instrumental Autonomy Subtask (IA) – Students who have completed this subtask demonstrate responsibility in their daily lives, as well as possess successful time management skills and problem solving skills, and are self-directed, responsible and goal oriented without needing extensive direction or support from others.
- C. Mature Interpersonal Relationships Task (MIR) – Higher achievers on this task: (a) have relationships with peers that are open, honest, and trusting; their relationships reflect a balance between dependence and self-assured independence; and (b) show respect for and acceptance of those of different backgrounds, beliefs, cultures, races, lifestyles, and appearances, without discrimination.
1. Peer Relationships Subtask (PR) – Having accomplished this subtask, students describe their relationships with peers as shifting toward greater trust, independence, honesty, and individuality, not feeling the need to conform to peer pressure or conceal his/her shortcomings, and having the ability to resolve disagreements in a helpful manner.
  2. Tolerance Subtask (TOL) – Students with high achievement on this subtask, maintain a healthy amount of respect for and acceptance of other individuals possessing different backgrounds, beliefs, cultures, races, lifestyles, and appearances.

- D. Salubrious Lifestyle Scale (SL) – This scale measures the degree to which a student practices healthy lifestyle and wellness habits, such as sleeping, eating, exercise, substance use, and stress management techniques.
- E. Response Bias Scale (RB) – A high score on this scale means that the student is attempting to portray himself/herself favorably, perhaps unrealistically.

The response bias scale of the SDTLA identifies unreliable scores of students who provide unusually favorable responses. The test authors have determined a response bias score greater than three as a biased score. It is recommended that these scores not be included in data analyses using the SDTLA (Winston et al., 1999a).

Demographic data obtained from the SDTLA included gender, age, racial or cultural background, current relationship status, academic class standing, location of residence, and international student status. For the purpose of the current study, current relationship status, location of residence, and international student status are beyond the scope of the research and will not be included in the analyses.

Winston et al. (1999a) assessed the reliability of the SDTLA through test-retest and internal consistency measures. Correlation coefficients were computed on the SDTLA tasks, subtasks, and scales. All of these coefficients were statistically significant at  $p < .01$  and ranged from 0.70 to 0.89, indicating moderate to high correlations between scores and therefore adequate test-retest reliability. Internal consistency was estimated using a large group of students,  $n=1822$ , from 20 four-year private, 19 four-year public and three two-year public colleges and universities. The

norms were developed based on this sample, which consisted of approximately 60% Females and 49% males, and ages 17-25. The ethnicity makeup of the sample included approximately 74% Caucasian, 16% African-American, 5% Asian, 2% Hispanic, and 3% Native American or multiracial. Cronbach's alpha, an internal consistency measure of the instrument, was computed and ranged from 0.62 to 0.88. The alpha coefficients of the SDTLA are provided in Table 1. The authors indicate the reliability "is more than adequate for group data" (Winston et al., 1999a, p. 25).

Table 1.  
Student Development Task and Lifestyle Assessment Reliability Estimates

SDTLA Task/Subtask/Scale	Alpha Coefficient
1) Establishing & Clarifying Purpose Task	.81
a) Career Planning Subtask	.84
b) Educational Involvement Subtask	.82
c) Cultural Participation Subtask	.76
d) Lifestyle Planning Subtask	.81
2) Developing Mature Interpersonal Relationship Task	.76
a) Tolerance Subtask	.74
b) Peer Relationship Subtask	.65
3) Developing Autonomy Task	.88
a) Instrumental Autonomy Subtask	.62
b) Emotional Autonomy Subtask	.71

Table 1. Continued

SDTLA Task/Subtask/Scale	Alpha Coefficient
c) Academic Autonomy Subtask	.77
d) Interdependence Subtask	.76
4) Salubrious Lifestyle Scale	.71
5) Response Bias Scale	.72

Validity was estimated in a variety of ways. In one approach, Winston et al. (1999a) used intercorrelations of tasks, subtasks, and scales to estimate construct validity. These intercorrelations yielded validity estimates of 0.10 to 0.73, with seven of the intercorrelations falling below 0.20. This indicates that several of the measures are at least moderately correlated with each other. In addition, the SDTLA was correlated with several other instruments that were developed using similar constructs and development theory background. Correlations of the other instruments with the three tasks included in the SDTLA yielded scores ranging from 0.27 to 0.62. These correlation values indicate a moderate level of estimated construct validity. In 2002 Wachs and Cooper (2002) completed an additional validity study using a longitudinal research method. Using participants who took the SDTLA as incoming freshmen and then again four years later, it was assumed that the students would make gains in specific developmental tasks over the course of their time in college and as they grew older. It was found that the students made gains in all of the tasks and subtasks, except the Salubrious Lifestyle Scale. Therefore it was determined that the SDTLA was sensitive



to measuring the psychosocial development of individuals across the time spent in college.

### **Additional Academic Background Questions**

Participating students were asked to provide additional academic background information, to allow identifying characteristics and factors that significantly contribute to differences in creativity and psychosocial development. The questions were presented to the students as an additional question sheet and answered on the SDTLA scantron answer sheet. A copy of the Additional Academic Background Question form can be found in Appendix B.

This data included a series of questions including whether the participants was currently participating in the Honors Program, whether they participated in Gifted and Talented programs and what level of school that participation took place, whether they had taken a course in creativity and the number of those courses taken, and whether they were a first generation college student. If the student was eligible for the Honors Program, but was not participating in it, they were considered to be a Non-Honors Program student. Overall college grade point ratio (GPR), SAT/ACT scores, highest level of Gifted and Talented Program Participation, number of Creativity Courses taken, High-School graduation rank, and college major data were also obtained, but determined to be outside the purview of the current study, due to the difficulty in obtaining accurate responses. Age was determined to be unnecessary as a demographic variable, as the age range was small and age increases do not necessarily increase creativity levels. This was

due to the fact that age does not have a meaningful impact on creativity scores and that age is not highly correlated with the tasks or subtasks of the SDTLA (Macari, 2003).

### **Procedure**

Institutional Review Board approval was received prior to the initiation of data collection. Students from four courses were asked to voluntarily participate in the study during the spring and summer semesters of 2006. The two courses in the Department of Educational Psychology were titled, “Adolescent Development for Educators” and “Personal Creativity of Gifted”. The additional two courses were two different sections of a Department of Architecture course titled, “Environmental Design: Design Process”. One section of “Environmental Design: Design Process” was classified as an Honors course in the College of Architecture. The other three courses did not have Honors classification. The other three courses did not have Honors classification. The architecture course faculty gave the students a participation point for taking the tests. The education course faculty did not give any extra credit or incentive for participating in the research study. All tests were administered during the regularly scheduled class time.

All of the participants voluntarily took part in the current study. Prior to administering the instruments, a written consent form was completed and obtained from each participating student. After completing the consent form, the TTCT, the SDTLA, and additional academic background questions were handed to each student. The students were asked to complete the instruments using a number two pencil in order for

the scantron answer forms to be scored correctly. The students were asked to write their names on each component of their test packet for the purpose of checking for completeness of all three test components.

The description of TTCT Activity 4 and Activity 5 was read before initiating the test session. Each of the TTCT activities was limited to ten minutes. Following completion of the timed TTCT activities, students completed the SDTLA and the additional academic background questions. The students had unlimited time to complete the SDTLA and the additional academic background question sheet. Total administration time was approximately sixty minutes, with approximately twenty minutes for the TTCT activities and approximately forty minutes for the SDTLA and additional academic background questions. After the three instruments were completed they were collected by the researcher and kept together as one test packet. Test packets remained organized based on the class in which the testing took place.

The instruments were then examined for completeness, including any missing data. Any SDTLA answer sheets that were completed in ink were colored in with pencil over the ink by the researcher in order for the scoring machine to read the answers. An individual identification number was given to each packet of instruments and it was written on each component of the test packet. The instruments were then separated into the TTCT tests and the SDTLA answer sheets, counted and mailed to the appropriate scoring agency. The additional academic background questions were answered on the same scoring sheet as the SDTLA and included with the SDTLA materials.

The TTCT was scored by professional scorers at the Scholastic Testing Service and returned to the researcher three weeks after they were mailed. The TTCT test forms were returned to the researcher along with the resulting data, which was provided in written form and organized by the student's identification number. The TTCT results were then entered into SPSS v. 14 statistical software package, by the researcher.

The SDTLA was scored by the Testing and Measurement Department at Appalachian State University, which provides all scoring for all SDTLA administration and is the holding institution of the instrument. Following scoring, the score sheets were returned in the mail and the results were provided electronically in a SPSS v. 14 statistical software package file. After all of the data was accurately entered, it was analyzed according to the parameters described in the Data Analysis section of this chapter.

### **Data Set Preparation**

The data from the TTCT, SDTLA, and additional academic background questions were merged into one data set by matching identification numbers. Participant names were removed from the data set in order to maintain confidentiality of the participants.

Following the initial review of the data, it was determined that several factors would indicate the removal of some cases from the study. The SDTLA authors and manual "recommend that data from instruments in which three or more response bias scale items are answered in the keyed direction not be used for research or evaluation

purposes” (Winston, Miller, & Cooper, 1999a, p. 31). Therefore, cases with response bias scores of four to six were eliminated from all data samples. There were nine cases that fell into this category.

Five additional cases were removed from the original sample when it was determined that they did not complete both instruments and did not follow directions. The resulting data set had an “n” of 284. The total number of eliminated cases was 14, which was approximately five percent of the overall sample size, and was determined to be an acceptable number of cases to eliminate.

After removing the high response bias cases from the sample, all variables on both the TTCT and SDTLA were examined for kurtosis, with acceptable values set at plus or minus two. The kurtosis level was high for several items on both the TTCT and SDTLA, when first analyzed. The TTCT scales with high kurtosis levels were: fluency national percentile and average national percentile. Square root transformations were performed on these variables, resulting in acceptable kurtosis levels below 2.0 on all TTCT variables. The kurtosis values were high on several SDTLA variables, including the Response Bias scale. Additional square root transformations were conducted on several SDTLA variables. In the resulting SDTLA data, the kurtosis level of the Response Bias scale was zero and the kurtosis level was found to be under the 2.0 threshold for all other SDTLA variables. Skewness of all variables was also evaluated and determined to be at an acceptable level.

Assumptions of independent t-tests are that the scores of the two groups are normally distributed, the individual scores are independent, and the variances of the two

groups are approximately equal or homogenous. Some square-root transformations were necessary to improve the normal distributions of the scores. However, as Glass and Hopkins note, “violation of the assumption of normality has almost no practical consequences in using the two-tailed t-test” and the probability of committing a type-I or type-II error is low (1996, p. 291).

An additional issue to be addressed in the SDTLA was the racial identity or Ethnicity variable. Ethnicity was identified in seven categories, with several categories containing a minimal number of cases. Because there were less than five subjects who identified themselves as Black, Native American or Bi-racial, they were reclassified to be included in the “Other” category of Ethnicity. This resulted in four categories of ethnicity: Hispanic, Asian, Caucasian and “Other”.

Another consideration in analyzing the data was handling missing data. There was less than six percent, or 92 data points, of missing data points on several different variables. This was determined to be an acceptable quantity of missing data. Missing data was found in SDTLA and demographic data variables. The TTCT did not have any missing data points. The missing data was managed through utilizing the computer program NORM (Schafer, 1999). The program uses a system of multiple imputations based on a logarithmic iteration formula in order to replace the missing data. Repeating the imputations several times generates multiple sets of new data with varying coefficients between the data sets. The variability is then added back into the value estimate. This process helps increase accuracy in the random error component of each score (Howell, 2007).

Following the multiple steps involved in preparing the data set to run in NORM, the program was utilized to replace the missing data points. This resulted in three data sets, each with slightly different results for the missing data points, which were then used to perform the statistical analyses. Normality, which is an assumption of the NORM software, was checked and determined to be present.

The final three data sets resulted in a sample of 284 participants with data from the three instruments. Analyses were run on each data set in order to obtain the estimate of the effect for each variable. The mean values of the demographic variables in the three data sets were reported for the demographic frequency analysis computed in the study, which accounts for several values not resulting in whole numbers.

### **Analysis of Data**

SPSS statistical software was used in all statistical analyses. A quantitative, quasi-experimental research study was utilized, due to a lack of random assignment in selecting the sample (Creswell, 1994). The independent variable in the current study was Honors program participation of college students, with the two categories of the independent variable being Honors or Non-Honors program participation. The first set of dependent variables consisted of the fourteen developmental outcomes, which were made up of the three developmental tasks, ten subtasks and one lifestyle task included in the SDTLA.

The second set of dependent variables consisted of the creativity scores included in the TTCT, which include raw scores, standard scores, national percentiles and local

percentiles for the scoring categories of fluency, flexibility, and originality. The average creativity score category includes standard scores, national percentiles, and local percentiles. The TTCT analyses utilized standard scores from the fluency, flexibility, originality and average creativity measures.

Research Question 1 asked whether there was a significant difference between college Honors and Non-honors students on creativity scores as measured by the *Torrance Tests of Creative Thinking* (TTCT) and if interaction effects based on ethnicity, gender, classification and the academic background factors were present. Independent Samples two-tailed t-tests were utilized to answer the first part of the question. The interaction effects were analyzed using Multivariate Analysis of Variance (MANOVA).

Research Question 2 assessed whether there was a significant difference between college Honors and Non-honors students on psychosocial development scores as measured by the *Student Development Task and Lifestyle Assessment* (SDTLA), again utilizing Independent Samples two-tailed t-tests. The second part of Research Question 2 evaluated interaction effects based on ethnicity, gender, classification, and the academic background factors, using Multivariate Analysis of Variance (MANOVA).

Research Question 3 utilized correlation analysis to determine whether significant relationships between creativity scores and psychosocial development outcome measures were present. A significance level of .05 ( $p < .05$ ) was established. Ethnicity, gender, classification, and academic background factors were also addressed



in relation to interaction effects, through the MANOVA performed in Research Questions 1 and 2.

As previously described in the procedures section of this chapter, homogeneity of variance is an assumption of the t-test. Although the samples are not equal in number and the homogeneity assumption is violated in the current study, according to Glass and Hopkins (1996) the sample means would have to be nearly four times different for the risk of committing a Type-I error to be high. They go on to explain that, “when the larger sample is from the population with the larger variance...the t-test is conservative with respect to committing type-I errors” (Glass & Hopkins, 1996, p. 293). In order to reduce a type-I and type-II statistical error, an alpha level of .05 ( $p < .05$ ) was set to determine statistical significance in the t-tests.

After the t-tests were performed with the three data sets, an additional analysis was computed using a formula in the Excel computer program. Only the variables in the SDTLA needed this additional analysis, as the three data sets had slightly different t-test scores as a result of the multiple imputation process. The TTCT had the same t-test scores in the three data sets. This program provided the final results of the t-test analyses. The final t-score was obtained by taking the average of the parameter estimates, or the mean differences, and dividing that by the average standard errors from the three imputed data sets (Schafer, 1999). Several of the variables on the SDTLA had both equal and unequal variances assumed in the mean differences. An average of the appropriate variances was obtained and the resulting mean difference was used in the formula.

Multivariate Analysis of Variance (MANOVA) was conducted to assess the significance of group differences considering the multiple dependent variables included in the academic background and demographic data. The assumptions of Multiple Analysis of Variance (MANOVA) include all of the assumptions for t-tests, as well as sensitivity to outlying scores, linearity and multicollinearity. In order to decrease the incidence of chance findings, increase trust of the results, and decrease the risk of a type-II error, an alpha level of .01 ( $p < .01$ ) was set in performing the MANOVA's.

### **Summary**

The research study was conducted at Texas A&M University, a large, public, four-year, Research I institution. Participants were volunteer students, classified as Honors program and Non-Honors program participants. The data was collected in four regularly scheduled courses, in two different colleges of Texas A&M University. The participants represent all undergraduate classification categories and are representative of varied backgrounds. Prior to performing the analyses, the data set was managed using square root transformations, multiple imputation software for missing data and variable reclassification.

Independent samples t-tests were used to test for significant differences in the Honors and Non-Honors program student groups, on the dependent variables of the TTCT and SDTLA, answering Research Questions 1 and 2. Multivariate Analysis of Variance (MANOVA) was utilized to determine significance of interaction effects on demographic and academic background variables, completing the data analysis of

Research Questions 1 and 2. Correlation analysis was used to answer Research Question 3 regarding relationships, while regression analysis evaluated interaction effects of demographic variables. The final results of the data analysis will be presented in the following chapter.

## CHAPTER IV

### RESULTS

The current chapter presents the statistical analysis and results of the data collected in this study. The first section provides the summary of the data. Section two contains the analysis of Research Question 1, which incorporates the data from the *Torrance Tests of Creative Thinking* (TTCT) and academic background questions. The third section of the chapter details the statistical analyses of Research Question 2, utilizing the data from the *Student Development Task and Lifestyle Assessment* (SDTLA) and academic background questions. Research Question 3, which supplies the analysis of the relationship between the TTCT and SDTLA, is addressed in the fourth section of the chapter. Finally, additional analyses relevant to the study are presented.

#### **Summary of Data**

Data preparation methods, as described in the previous chapter, were utilized to fill in missing data and resulted in three very similar data sets. The analyses involving the first portion of Research Questions 1, 2 and 3 were performed on all three data sets. The analyses that comprised the second parts of Research Question 1, 2, and 3 consisted of using the three data sets and evaluating them separately, for agreement in the findings.

#### **Study Population and Sample**

The sample used in the current study was drawn from students at Texas A&M University and included a total of 284 participants, with 120 Honors program

participants and 164 Non-Honors program participants. As Table 2 illustrates, 55.3% (157) of the students were female and 44.7% (127) were male. The sample consisted of mainly White participants (79.7%), with Hispanics found to be 8.7%, Asians accounting for 4.5% and an additional 6.8% making up the “Other” category. Each of the classification categories were relatively equally represented, with the sample containing 20.7% (58.66) freshmen, 22.3% (63.33) sophomores, 20.5% (58.33) Juniors, 31.8% (90.33) Seniors and the remaining 4.7% (13.33) reporting their classification as “Other”.

A majority of participants, 62.6%, reported they had participated in Gifted and Talented programs (GT) at some level of Elementary or Secondary education. Participants reported their highest academic level of GT participation. GT participation was shown to include 12.4% participating at the Elementary school level, 12.4% in Middle school, and 75.4% in High school. There were 27.8% reporting they were first generation college students and 72.2% not in the first generation college student category. Participants reported 79.6% having taken at least one creativity class and 20.4% reported not taking a creativity class. The number of creativity classes taken ranged from 1 to 5 or more.

Table 2.  
Participants Demographic Characteristics (N=284)

Characteristic		N	Percentage
Group	Honors	120	42.3
	Non-Honors	164	57.7
Gender	Female	157	55.3
	Male	127	44.7
Ethnicity	Caucasian	226.33	79.7
	Hispanic	24.66	8.7
	Asian	13.66	4.8
	Other	19.33	6.8
Classification	Freshman	58.66	20.7
	Sophomore	63.33	22.3
	Junior	58.33	20.5
	Senior	90.33	31.8
	Other	13.33	4.7
First Generation College Student	Yes	79	27.8
	No	205	72.2
GT Participation	Yes	177.66	62.6
	Elementary	22	12.4
	Middle	22	12.4
	High	134	75.4
	No	106.33	37.4
Creativity Class Participation	Yes	226	79.2
	1 Class	197	87.2
	2 Classes	15	6.6
	3 Classes	7	3.1
	4 Classes	1	.4
	5 or more	6	2.6
	No	58	20.4

The ages of the participants mainly fell into the traditional college student range, with 98.9% (281) ranging between 18 to 24 years old, and the remaining 1.1% (3) being over 24 years old. Age frequencies are presented in Table 3.

Table 3.  
Participants Age Frequencies

		N	Percentage	Average	Age Range
Age	24 and Under	281	98.9	20.33	18-24
	Over 24	3	1.1	26.3	25-29
	Overall	284	100	20.39	

### Research Question One

Research Question One asks, "Is there a significant difference between college Honors students and Non-Honors students on creativity measures of the *Torrance Tests of Creative Thinking* (TTCT) and are those interaction effects based on age, ethnicity, gender, classification, area of major and academic background factors?" The first part of the question was answered using two-tailed independent sample t-tests to determine significant differences in college Honors students and Non-Honors students on fluency, flexibility, originality and average creativity standard scores. The independent variable was group participation in Honors programs. The dependent variables were the creativity outcomes measures. An alpha level of 0.05, ( $p < .05$ ), was established in order to determine statistical significance in the t-tests.

The t-tests suggest clear, statistically significant differences between the mean scores of Honors and Non-Honors students in fluency, originality, and average creativity

standard scores. Fluency t-test results are presented in Table 4. The means of the fluency standard scores were significantly higher for Non-Honors students ( $M = 12.5976$ ) than the Honors students ( $M = 8.10591$ ). This indicated that the Non-Honors students were able to provide a larger number of distinctly different responses on the TTCT. The degrees of freedom for fluency standard scores were 279.984. The complete t-test results are available in Appendices C and D.

Table 4.  
Fluency t-test Results

	Group	N	Mean	SD	t	p
Fluency Standard Score	Honors	120	72.2583	8.10591	2.782	.006
	Non-Honors	164	75.5976	12.10218		

( $p < .05$ )

Table 5 illustrates the t-test showing clearly significant differences in the average means of Honors and Non-Honors students on originality scores. The Non-Honors students mean scores ( $M = 15.1232$ ) were statistically significantly higher than the Honors students mean scores ( $M = 11.8183$ ). Originality scores refer to the novelty or infrequency of responses based on norms groups of the TTCT. Degrees of freedom for the originality standard scores were determined to be 280.751. These results indicate that the Non-Honors students provided more unique responses than their Honors student counterparts.



Table 5.  
Originality t-test Results

	Group	N	Mean	SD	t	p
Originality Standard Score	Honors	120	73.9917	11.8183	2.491	.013
	Non-Honors	164	77.9756	15.12320		

( $p < .05$ )

Statistically significant differences of the average mean scores were determined in the average standard scores of creativity t-tests. The results of the t-test for the average standard creativity score are contained in Table 6. The average standard score of creativity is the sum of fluency, flexibility and originality scores. The means of the average standard score were significantly higher for the non-honors students than the honors students. This indicates that the non-honors student's sum of fluency, flexibility and originality scores were higher than the honors student's scores.

Table 6.  
Average Standard Scores of Creativity t-test Results

	Group	N	Mean	SD	t	p
Creativity Average Score	Honors	120	70.5417	7.94825	2.121	.035
	Non-Honors	164	72.9329	11.04654		

( $p < .05$ )

The second part of Research Question 1 was answered using Multivariate Analysis of Variance (MANOVA) to examine any interaction effects of selected demographic and academic background factors. MANOVA uses one procedure to evaluate the significance of group differences in multiple dependent variables (Tatum,

2002), as well as identifying “the independent variables which differentiate a set of dependent variables the most (Garson, 2008).” The dependent variables include both creativity and psychosocial development outcome measures. As previously stated in Chapter III of the current study, age, area of major, overall college grade point ratio (GPR), SAT/ACT scores, highest level of Gifted and Talented Program Participation, number of Creativity Courses taken, and High-School graduation rank were not included as variables in the multivariate analysis.

The Wilks Lambda multivariate test was given in order to test overall differences among groups. The groups included the demographic and academic background variables utilized in the MANOVA. Ethnicity was defined as Caucasian, Hispanic, Asian, and “Other”. Classification is defined as freshman, sophomore, junior, or senior as determined by the number of semesters in college reported by each participant. The Classification category of “Other” was removed from the analysis, as its definition was unclear. Participants identified themselves as Honors students or Non-Honors students and gender was defined as male or female. This data also included first generation college student, Gifted and Talented program participation, and creativity class participation. An alpha level of .01 was set to determine statistical significance in the MANOVA computations, in order to increase trust in the results that differences were actually present and due to the large number of dependent variables.

Again, as in the previous analyses, the three data sets were utilized in the MANOVA. However, they were simply reviewed for agreement in this portion of the analysis, as there was no feasible manner in which to combine the MANOVA results as

a true average result of the three sets. The results of the multivariate analysis were presented utilizing this agreement of the three data sets and numeric values represent those of one data set. Additionally, Garson (2008) provided supplementary interpretation and data presentation information.

A cross-tabs analysis was completed on all combinations of demographic variables used in the current study in order to determine pair-wise interactions and the number of sample participants in each group. All categories of the demographic variables must be present, with a minimum sample size of “n = 5”, in order to be utilized in the MANOVA. As a result, it was determined that there was not enough data available in each cell to use Ethnicity and Classification as interaction effects.

The MANOVA Wilks Lambda results revealed significant omnibus F main effect differences among the demographic and academic background variables, gender ( $p = 0.000$ ; partial eta-squared = .2), classification ( $p = 0.000$ ; partial eta-squared = .13), Honors program participation ( $p = .000$ ; partial eta-squared = .173), ethnicity ( $p = 0.000$ ; partial eta-squared = .12), and Classification by Gender ( $p = .002$ ; partial eta-squared = .114). Within the significant test results, the effect sizes were medium to large. The other demographic and academic background variables did not yield significant omnibus F scores. Complete MANOVA main effects scores are included in Appendix E.

In addition, upon further review, univariate between-subjects tests consistently showed that classification was statistically significantly related to fluency ( $p = .011$ ; partial eta-squared = .043). However, this relationship was small. There were no other

statistically significant relationships between demographic variables and the dependent variables of the creativity scores.

Post hoc comparisons between groups using Sidak Test, with the homogeneity of variances assumed, and Games-Howell, with the homogeneity of variances not assumed, were completed. Post hoc tests were completed on the Ethnicity and Classification variables only. While the tests of between-subjects effects revealed a statistically significant relationship between classification and fluency, the post hoc tests did not confirm differences between any of the classification groups and fluency. The three data sets did not agree, and in fact only one data set indicated a statistically significant difference on the Games-Howell post hoc test. This difference was between Sophomore's and Senior's with Fluency as the dependent variable ( $p = .014$ ), with Senior's having a higher Fluency mean score than the Sophomore's. Upon careful review of the post hoc data, there were no significant differences in Ethnic groups or the remaining Classification levels in the creativity measures.

The results of the second part of Research Question One indicate that only Classification was related to Fluency at a statistically significant level. However, post hoc tests did not confirm those significant results. Therefore, of the demographic and academic background variables, only Classification created slight interaction effects on the statistically significant differences found in Honors and Non-Honors students on measures of creativity.

## Research Question Two

Research Question Two asks “Is there a significant difference between college honors students and non-honors students on psychosocial development scores from the *Student Development Task and Lifestyle Assessment (SDTLA)* and are there interaction effects based on age, ethnicity, gender, classification, area of major and academic background factors?” The first part of the question was answered using two-tailed independent samples t-tests to determine significant differences in college honors students and non-honors students on scores of the three tasks, ten sub-tasks, and one scale utilized in the SDTLA outcomes measures. An alpha level of 0.05, ( $p < .05$ ), was used to determine statistical significance.

The data was reported in previously converted individual SDTLA T-scores, with a mean of 50 and the standard deviation of 10 being set for each individual T-score (Winston, Miller, & Cooper, 1999a). According to the test authors, a score within one-half standard deviation of the mean score should be considered largely equal to the mean, which would equal scores of 45-55. The square root of each of the SDTLA mean scores was taken, in order to deal with the kurtosis levels in the data preparation process. If the square root of the normed population mean, which is 45 to 55, is taken then the resulting mean is 6.71 to 7.42. Therefore, a mean score of 6.71 to 7.42 in the current study would be mostly regarded as equivalent to the normed population mean.

Evaluation of the mean scores indicates that all psychosocial development averaged mean scores of both the Honors and Non-Honors program students were within the norm group population sample range. This indicates that while the Honors students

obtained higher scores, they did not score higher than the normative population sample and therefore does not suggest advanced personal and social development among Honors students as compared to the Non-Honors students. Both Honors and Non-Honors students scored within the normal developmental range, as indicated by the SDTLA.

The t-tests revealed there were statistically significant differences between the average mean scores of Honors and Non-Honors student groups on all fourteen developmental outcomes of the SDTLA. The t-test results for all SDTLA scores are presented in Table 7. The average means of all the SDTLA scores were statistically significantly higher for the Honors students than the Non-Honors students. This suggests that the Honors student's possess more advanced personal and social development compared to the Non-Honors student's participating in the current study.

Table 7.  
SDTLA t-test Results

	Group	N	Average Mean	Average SD	t	p value
Career Planning	Honors	120	7.347	.65498	-4.48442	.00001
	Non-Honors	164	6.9763	.70809		
Lifestyle Planning	Honors	120	7.3303	.62843	-3.58132	.0004
	Non-Honors	164	7.0369	.73452		
Instrumental Autonomy	Honors	120	7.3643	.54546	-5.0149	.0000
	Non-Honors	164	6.9719	.77054		

Table 7. Continued

	Group	N	Average Mean	Average SD	t	p value
Cultural Participation	Honors	120	7.0155	.80829	-2.25801	.02471
	Non-Honors	164	6.8057	.74597		
Peer Relationships	Honors	120	7.0688	.77208	-2.39953	.01707
	Non-Honors	164	6.8301	.87245		
Tolerance	Honors	120	7.0604	.70619	-2.68018	.00791
	Non-Honors	164	6.811	.81976		
Emotional Autonomy	Honors		7.0054	.73939	-2.97296	.003206
	Non-Honors	164	6.7071	.92924		
Salubrious Lifestyle	Honors	120	7.4226	.65814	-4.46571	.000012
	Non-Honors	164	7.0424	.73066		
Academic Autonomy	Honors	120	7.5501	.64110	-8.37775	.00000
	Non-Honors	164	6.8261	.81007		
Interdependence	Honors	120	7.1697	.64749	-4.72849	.000004
	Non-Honors	164	6.7904	.6768		
Educational Involvement	Honors	120	7.2156	.66850	-5.06846	.000000
	Non-Honors	164	6.7793	.76628		
Est. and Clarity of Purpose	Honors	120	7.2754	.63905	-5.18105	.000000
	Non-Honors	164	6.8473	.74389		
Developmental Autonomy	Honors	120	7.3278	.61401	-6.98241	.000000
	Non-Honors	164	6.7438	.79446		

Table 7. Continued

	Group	N	Average Mean	Average SD	t	p value
Mature Interpersonal Relationships	Honors	120	7.0406	.80912	-2.94059	.003547
	Non-Honors	164	6.7408	.8754		

( $p < .05$ )

In the second part of Question Two, MANOVA was used to analyze any interactions of selected demographic and academic background factors. MANOVA uses one procedure to evaluate the significance of group differences in multiple dependent variables (Tatum, 2002), which focus on the psychosocial development outcome measures in this research question. As previously stated in Chapter III of the current study, age, area of major, overall college grade point ratio (GPR), SAT/ACT scores, highest level of Gifted and Talented Program Participation, number of Creativity Courses taken, and High-School graduation rank were not included as variables in the multivariate analysis.

The Wilks Lambda multivariate test was used in order to test overall differences among groups. The groups included the demographic and academic background variables utilized in the MANOVA. Ethnicity was defined as Caucasian, Hispanic, Asian, and "Other". Classification is defined as freshman, sophomore, junior, or senior as determined by the number of semesters in college reported by each participant. The Classification category of "Other" was removed from the analysis, as its definition was unclear. Participants identified themselves as Honors students or Non-Honors students



and gender was defined as male or female. This data also included first generation college student, Gifted and Talented program participation, and creativity class participation. An alpha level of .01 was set to determine statistical significance in the MANOVA computations, in order to increase trust that differences were actually present in the results and due to the large number of dependent variables involved in the analysis.

Again, as in the previous analyses, the three data sets were utilized in the MANOVA. However, they were simply reviewed for agreement in this portion of the analysis, as there was no feasible manner in which to combine the MANOVA results as a true average result of the three sets. The results of the multivariate analysis were presented utilizing this agreement of the three data sets and numeric values represent those of one data set.

A cross-tabs analysis was completed on all combinations of demographic variables used in the current study in order to determine pair-wise interactions and the number of sample participants in each group. All categories of the demographic variables must be present, with a minimum sample size of “ $n = 5$ ”, in order to be utilized in the MANOVA. As a result, it was determined that there was not enough data available in each cell to use Ethnicity and Classification as interaction effects, as there were no Asian students who were Juniors.

The MANOVA Wilks Lambda results revealed consistently significant omnibus F main effects among the demographic and academic background variables, Gender ( $p = 0.000$ ; partial eta-squared = .191), Classification ( $p = 0.000$ ; partial eta-squared = .151),

Honors program participation ( $p = .000$ ; partial eta-squared = .173), Ethnicity ( $p = 0.000$ ; partial eta-squared = .124), and Classification by Gender ( $p = .002$ ; partial eta-squared = .114). Within the significant test results, the effect sizes were medium to large. The remaining demographic and academic background variables of Creativity Class participation, Gifted and Talented Program Participation and First Generation College Student did not yield significant F scores on the dependent variables of the psychosocial outcomes measures. Appendix E contains the complete MANOVA main effects scores. The results of the MANOVA indicate that these remaining demographic and academic background variables did not interact with the dependent personal and social development outcomes measured by the SDTLA.

Univariate between-subjects tests revealed some inconsistently statistically significant relationships between Ethnicity and the dependent variables of the SDTLA. All three data sets indicated a statistically significant relationship between Ethnicity and Lifestyle Planning (LP) ( $p = .000$ ; partial eta-squared = .072).

Some inconsistencies were also present regarding Classification. Classification showed relationships of consistent statistical significance on eight of the fourteen development outcomes measures of the SDTLA. Each of the following personal and social development outcomes showed a significant relationship with Classification, on all three data sets: Emotional Autonomy (EA) ( $p = .001$ ; partial eta-squared = .063), Salubrious Lifestyle (SL) ( $p = .000$ ; partial eta-squared = .079), Academic Autonomy (AA) ( $p = .000$ ; partial eta-squared = .104), Interdependence (IND) ( $p = .000$ ; partial eta-squared = .114), Educational Involvement (EI) ( $p = .000$ ; partial eta-squared = .146),

Establishing and Clarifying Purpose (PUR) ( $p = .000$ ; partial eta-squared = .084), Developing Autonomy (DA) ( $p = .000$ ; partial eta-squared = .139), and Mature Interpersonal Relationships (MIR) ( $p = .006$ ; partial eta-squared = .048). Honors program participation consistently indicated statistically significant relationships with Career Planning (CP) ( $p = .000$ ; partial eta-squared = .058), Lifestyle Planning (LP) ( $p = .002$ ; partial eta-squared = .037), Instrumental Autonomy (IA) ( $p = .000$ ; partial eta-squared = .054), Academic Autonomy (AA) ( $p = .000$ ; partial eta-squared = .114), Establishing and Clarifying Purpose (PUR) ( $p = .001$ ; partial eta-squared = .043), and Developing Autonomy (DA) ( $p = .000$ ; partial eta-squared = .058).

Gender also showed some inconsistencies between the three data sets. Consistent relationships of statistical significance with Gender were present on Emotional Autonomy (EA) ( $p = .001$ ; partial eta-squared = .043) and the Salubrious Lifestyle Scale (SL) ( $p = .008$ ; partial eta-squared = .028). The interaction of Classification and Gender yielded consistent results on all three data sets. The statistically significant results in the relationship of Classification and Gender were with the developmental outcome of Interdependence (IND) ( $p = .005$ ; partial eta-squared = .055) and Developing Autonomy (AUT) ( $p = .006$ ; partial eta-squared = .048). Most effect sizes of the significant relationships were within the medium to large range.

Post hoc comparisons between groups using the Sidak Test, with the homogeneity of variances assumed, and Games-Howell, with the homogeneity of variances not assumed, were completed. Post hoc tests were completed on the Ethnicity and Classification variables only. Upon careful review of the post hoc data, there were

several statistically significant differences in groups that were also present consistently in the three sets of data.

While a statistically significant interaction effect between Peer Relationships (PR) and Classification was not present, the post hoc test of Games-Howell did indicate a consistently significant difference between Freshmen and Senior's ( $p = .008$ ) on this dependent variable. Both post hoc tests showed consistently statistically significant differences in Freshmen and Junior's ( $p = .005$ ) and Freshmen and Senior's ( $p = .003$ ) on the Emotional Autonomy (EA) dependent variable. The Salubrious Lifestyle (SL) dependent variable also yielded consistent differences, with both post hoc tests, between Freshmen and Senior's ( $p = .000$ ) and Sophomore's and Senior's ( $p = .002$ ). Academic Autonomy, Interdependence, Educational Involvement, and Developing Autonomy also showed consistently statistically significant differences between groups of Freshmen and Junior's and Freshmen and Senior's. These results can be viewed in Table 8.

Table 8.  
Post hoc Tests of Significant Classification Differences

			Sidak Post hoc Test	Games-Howell Post hoc Test
Emotional Autonomy	Freshmen	Junior	.005	.003
		Senior	.003	.003
Academic Autonomy	Freshmen	Junior	.001	.002
		Senior	.000	.000
Interdependence	Freshmen	Junior	.000	.000
		Senior	.000	.000
Educational Involvement	Freshmen	Junior	.001	.001
		Senior	.000	.000

Table 8. Continued

			Sidak Post hoc Test	Games-Howell Post hoc Test
Developing Autonomy	Freshmen	Junior	.000	.000
		Senior	.000	.000

( $p < .01$ )

While the dependent variable Establishing and Clarifying Purpose demonstrated consistent statistically significant results with Classification as an interaction effect, there were inconsistent results in the differences between the groups of class standing. The consistent differences were present between Freshmen and Senior's ( $p = .000$ ), on both post hoc tests. Mature Interpersonal Relationships and Classification did not yield consistent significant results as interaction effects, but there were consistent differences found between Freshmen and Senior's ( $p = .009$ ), on both post hoc instruments.

The post hoc tests of differences in the Ethnic groups yielded much less consistent results, as did the results involving Classification groups. Consistently statistically significant differences were present between groups of Caucasian and "Other" students on Lifestyle Planning (LP) ( $p = .000$ ), using the Sidak post hoc test. There were no other differences in Ethnicity on psychosocial development outcome measures, as determined by the post hoc tests.

The results of the second part of Research Question Two, indicate that Gender, Classification, Ethnicity, Honors program participation and Classification with Gender were multivariately related to the psychosocial development outcome measures of the SDTLA. The univariate between-subjects tests further indicated consistently significant

interactions of several demographic and academic background variables. The post hoc tests helped to confirm several of these differences.

### **Research Question Three**

In Research Question Three it is asked, “Is there a significant relationship between creativity scores and psychosocial development scores and are there interaction effects based on age, ethnicity, gender, classification, area of major and academic background factors?” Correlation analysis was used to determine any relationships between the four creativity measures and fourteen psychosocial development outcomes scores. In addition, demographic and academic background factors were examined to determine if they created interaction effects in the results.

The Pearson correlation analyses were performed using the three data sets, resulting in three sets of correlations. The three sets of correlations were then averaged using an excel formula, the Multiple Imputation of Standard Error Correlation. The formula results presented an average of the three correlations, the standard error for the computation (which is the Fisher’s Z-transformed correlation), the correct t-test for the average transformed correlation and the probability that the correlation is zero. This allowed for determining whether the averaged correlations were significant by their difference from zero. Results of the correlation analysis between the SDTLA and TTCT are provided in Table 9. Appendix F contains the complete correlation tables.

The strength of correlation is commonly determined as 0.0 to 0.3 as not correlated, 0.3 to 0.6 moderately correlated, and 0.6 to 1.0 highly correlated. Although

significance levels were set at both 0.05 and 0.01, this does not necessarily indicate a moderate or high level of correlation. Careful review of the data reveals several significant correlations at the 0.05 and 0.01 level, indicating relationships between several TTCT and SDTLA variables. However, none of the significant correlations met the criteria of being moderately or highly correlated. This demonstrates that while some relationships were present, however they did not meet the criteria for a significantly large or even moderate relationship, therefore rendering no truly meaningful correlations.

Establishing and Clarifying Purpose (PUR) was slightly correlated with all four creativity measures at both the  $p < 0.05$  and  $p < 0.01$  significance level. Cultural Participation (CUP) also slightly correlated with all four creativity measures, with all values being significant at the  $p < .01$  level. In addition, Tolerance (TOL) and Lifestyle Planning (LP) were slightly correlated with at least one measure of creativity.

Fluency was significantly correlated with Establishing and Clarifying Purpose (PUR) (.1437,  $p < .01$ ) and Cultural Participation (CUP) (.2524,  $p < .01$ ). Flexibility was significantly correlated with Establishing and Clarifying Purpose (PUR) (.1683,  $p < .01$ ), Cultural Participation (CUP) (.2403,  $p < .01$ ), and Lifestyle Planning (LP) (.1387,  $p < .05$ ). Originality was significantly correlated with Establishing and Clarifying Purpose (PUR) (.1427,  $p < .05$ ), Cultural Participation (CUP) (.277,  $p < .01$ ), and Tolerance (TOL) (.1687,  $p < .05$ ). The Average Standard creativity score was significantly correlated with Establishing and Clarifying Purpose (PUR) (.1557,  $p < .05$ ), Cultural Participation (CUP) (.2587,  $p < .01$ ) and Tolerance (TOL) (.1493,  $p < .05$ ).

Table 9.  
Correlation Analysis of SDTLA and TTCT

		Fluency Standard Score	Flexibility Standard Score	Originality Standard Score	Average Standard Score
Establishing and Clarifying Purpose Standard Score Square Root	Average Correlation	.1437*	.1683**	.1427*	.1557*
Career Planning Standard Score Square Root	Average Correlation	.0083	.0607	-.03	.0047
Educational Involvement Standard Score Square Root	Average Correlation	.0397	.073	.0633	.0613
Cultural Participation Standard Score Square Root	Average Correlation	.2524**	.2403**	.277**	.2587**
Lifestyle Planning Standard Score Square Root	Average Correlation	.1277	.1387*	.1003	.132
Developing Mature Interpersonal Relationships Standard Score Square Root	Average Correlation	.0853	.0363	.1123	.0977
Tolerance Standard Score Square Root	Average Correlation	.1297	.0933	.1687**	.1493*
Peer Relationships Standard Score Square Root	Average Correlation	-.0243	-.073	-.023	-.026
Developing Autonomy Standard Score Square Root	Average Correlation	.067	.079	.0837	.0873
Instrumental Autonomy Standard Score Square Root	Average Correlation	.0997	.0717	.0627	.085
Emotional Autonomy Standard Score Square Root	Average Correlation	.0673	.0637	.1173	.094
Academic Autonomy Standard Score Square Root	Average Correlation	-.016	.0263	-.0087	.0183



Table 9. Continued

		Fluency Standard Score	Flexibility Standard Score	Originality Standard Score	Average Standard Score
Interdependence Standard Score Square Root	Average Correlation	.062	.0813	.0707	.0707
Salubrious Lifestyle Standard Score Square Root	Average Correlation	-.0613	.0247	-.096	-.047

\*\* =  $p < .01$

\* =  $p < .05$

The second part of Research Question 3 demonstrated whether there were interaction effects based on age, ethnicity, gender, classification, area of major and academic background factors associated with the creativity and psychosocial development correlations. After completing the MANOVA, as described in Research Question 1 and Research Question 2, it became apparent that this part of Research Question 3 had already been evaluated through the use of the MANOVA. The interaction effects were evaluated through the use of this statistical analysis and no further analysis was necessary to indicate interaction effects.

## CHAPTER V

### SUMMARY, DISCUSSION AND RECOMMENDATIONS

This study started with a discussion of higher education and its impact on both creativity and psychosocial development. Of particular importance was the influence of Honors programs on these outcome measures. Considering the increasing importance that institutions are placing on Honors Programs and also the growth in both the number of programs offered as well as the amount of financial and other resources being infused into Honors Programs, it was important to assess their contribution to student's creativity and personal, social, and emotional development. As a result, the purpose of this study was to determine if there were significant differences in Honors and Non-Honors program participants on measures of creativity and psychosocial development. Additionally, the purpose was to investigate significant relationships between creativity and psychosocial development. The final consideration of this study was to assess if demographic and academic background variables had interaction effects in the analyses.

#### **Summary of Findings**

The current research study used a sample of 284 college students, from Texas A&M University. The subjects voluntarily participated in the study and completed informed consent forms prior to the test administration. The testing was conducted in four course sections, during the 2006 spring and summer semesters. The sample consisted of 120 Honors and 164 Non-Honors program participants. Data was collected

using the *Torrance Tests of Creative Thinking* and the *Student Development Task and Lifestyle Assessment*. The resulting data from the two testing instruments was scored and analyzed using t-tests, MANOVA and correlations.

### **Research Question One**

In answering Research Question One, this study found that in fact Honors and Non-Honors students did differ significantly in the creativity measures of the TTCT. The Non-Honor students scored significantly higher than the Honors students on three of the four creativity measures, from the TTCT. Non-Honors students scored significantly higher on the fluency, originality and average standard scores of creativity.

According to the TTCT scoring manual (Torrance, 1990), fluency scores indicate the production of a large amount of ideas using words, originality indicates the ability to create ideas that are different from the obvious or usual, and average standard scores are possibly the overall best indicator of creative strength (Torrance, 1990). The differences of the groups studied must be put into context as to the overall strength of the creative abilities. Using the scoring manual and the mean standard score for each creativity metric, the national percentile is obtained. While the Non-Honors students mean score was significantly higher on the three measures of creativity, both student groups mean scores were below the fourteenth percentile of the national percentile.

This information is particularly important in viewing the average standard score of creativity. The national percentile of Non-Honors students was seven and the national percentile of Honors students was six. For both groups, this falls into the Weak (0-16%)

category, with the average standard score falling into the bottom 16 percent. Therefore, while the Non-Honors student's average standard scores of creativity were statistically higher than the Honors students, neither group appeared to possess especially high creativity scores.

In addition to the differences found in Honors and Non-Honors students in creativity, most of the demographic and academic background variables did not interact with the measures of creativity. Only classification was found to have an interaction with fluency scores. However, the post hoc test results were mixed and failed to confirm the statistically significant interaction of any particular classification level with the creativity measure of fluency. These results imply that gender, ethnicity, First Generation college student, GT participation, and creativity class participation did not have a relationship with the creativity scores.

In light of the MANOVA analysis, whether a student took a creativity course or participated in GT programs did not appear to have an interaction effect with creativity scores. The relationship between participating in GT programs and creativity courses and creativity scores may not be completely indicative of the impact of these programs on overall creativity scores. A pre-test to assess creativity levels prior to the participation in these programs would need to be done. However, it is interesting that the students who had participated in these types of programs did not appear to have higher creativity scores, nor did their mean scores rise above the level of 'weak' as far as their scores compared to the normative sample scores (Torrance, 1990).

## **Research Question Two**

The results of this study indicated that the Honors and Non-Honors students possess statistically different scores in the measures of personal and social development, as measured by the SDTLA. The Honors students had statistically significant higher values of psychosocial development on all fourteen-outcome scores of the SDTLA, from their Non-Honors student counterparts. These fourteen scores include three tasks, ten subtasks, and one scale. These findings suggest that the Honors students were more highly developed on the personal and social development tasks measured by the SDTLA. While the significance in the differences of scores is an important finding, it must be placed into context of the normative data. Neither Honors nor Non-Honors students in this sample scored outside the range of what was considered to be “normal” scores of the developmental measures. This appears to indicate that neither group should be considered “highly” developed, as far as their SDTLA scores.

After the results of the MANOVA were obtained and evaluated, it could be seen that Gender, Classification, Honors program participation, Ethnicity, and Classification by Gender did have statistically significant interaction effects on the psychosocial variables of the SDTLA. Upon further review, the interaction effects focused on were related to Gender and Classification.

Caucasian student’s interaction scores were significantly higher than those of students in the “Other” category, which was made up of African American, Native American, Bi-racial, and “Other”, on the Lifestyle Planning variable. It may be unclear as to the actual significance of these differences, due to the wide difference in the sample

size of each group. One possible explanation of this difference may be that the ethnic groups that make up the “Other” category have not had as much exposure to the areas of lifestyle planning, such as future educational and vocational objectives or have not clearly thought out how their current activities relate to expectations of their future lives.

While the normative data of the SDTLA indicated significant differences between men and women, so much so that different standard scores were computed for the instrument, the current study indicated significant differences in interaction effects on only two variables. The male students had higher interaction scores on the Emotional Autonomy Subtask (EA) and female students had higher scores on the Salubrious Lifestyle Scale (SL). Accomplishing the EA Subtask is described by needing less approval and continuous reassurance from other’s, greater confidence and trust in own ideas, feelings, decision-making, and voicing differences of opinion in large groups, and possessing constructive relationships with those in authority (Winston et al., 1999a). The fact that being male was a larger interaction factor on this variable appeared to fit with the overall indication that males have higher overall mean scores in EA. The female student’s higher interaction scores on the SL Scale appear to indicate that being female has a greater impact on whether a student consistently practices healthy lifestyle choices; including alcohol and tobacco use, eating and exercise habits, and sleep patterns (Winston et al., 1999a).

The SDTLA normative data indicates significant differences in all Tasks, Subtasks, and Scales in Classification levels, with increases between each successive academic year. The current study found significant interactions on several psychosocial

outcome measures, at the level of classification. The data from this study and the normative data appeared to correspond, in that the interaction value of the development measures did seem to decrease over the college years. This seems to show that the classification level interacts at lower levels, as the student progresses in class status.

Overall, Classification had significant levels of interaction with eight of the fourteen social and personal development outcome variables, including the PUR Task, EI Subtask, AUT Task, AA Subtask, EA Subtask, IND Subtask, and MIR Task, and the SL Scale. The normative data show differences between some classification levels and thirteen of the fourteen variables. This appears to indicate fairly significant changes that took place over the course of the student's college career. This also fits with the expected progression of increased development over the years of college (Chickering, 1969; Chickering & Reisser, 1993).

There was a significant difference between freshmen and seniors in the Peer Relationships Subtask (PR). The freshmen had significantly higher interaction scores on this variable than the seniors. This appeared to indicate that being a freshman had a greater impact on the ability to develop meaningful and respectful relationships than the senior's scores (Winston et al., 1999a). This pattern also played out in the other variables with significant interaction differences in freshmen and seniors, freshmen and juniors, or sophomores and seniors. The freshmen had greater levels of interaction on the Developing Autonomy Task (AUT), Emotional Autonomy Subtask (EA), Academic Autonomy Subtask (AA), Interdependence Subtask (IND), and Educational Involvement Subtask (EI), than both juniors and seniors. The significant differences in interaction

levels were present between freshmen and seniors as well as sophomores and seniors on the Salubrious Lifestyle Scale (SL).

The fact that the Honors Program participation had interaction effects was not unexpected, as there were significant differences in all SDTLA variables between the Honors and Non-Honors students. The higher values of statistically significant interaction effects of Honors program participation were found in the Establishing and Clarifying Purpose Task (PUR), Career Planning Subtask (CP), Lifestyle Planning Subtask (LP), Developing Autonomy Task (AUT), Academic Autonomy Subtask (AA), and Instrumental Autonomy Subtask (IA). The PUR task is made up of four subtasks, two of which had higher significant interaction effects and include the CP and LP subtasks. The AUT task, which is made up of four subtasks, included two of the subtasks with the higher interaction effects.

Regarding the PUR Task, the Honors students appear to have higher levels of interaction in regards to delineated and examined career goals, a personal course for their lives that incorporates their values, family plans and educational goals, and active interest in many different cultural activities (Winston et al., 1999a). By possessing higher CP Subtask interaction scores, it would seem to indicate Honors programs influence greater wisdom of the world of work and the requirements of chosen future occupation (Winston et al., 1999a). Higher LP Subtask interaction scores appear to demonstrate that Honors students have an increased level of direction in issues of a personal, family, ethical, religious, vocational and educational nature (Winston et al., 1999a). The Honors student's higher AUT Task interaction scores appear to indicate



that Honors programs may affect a greater level of independence, time-management skills, study skills, and responsibility, in their students (Winston et al., 1999a). Higher AA Subtask interaction scores seem to demonstrate that the Honors students were more goal and achievement oriented, responsible, and had better overall study habits than the Non-Honors students (Winston et al., 1999a). Finally, higher IA Subtask interaction scores appear to reveal the ability to demonstrate responsibility, effective time management and self-sufficiency, which was seemingly revealed by the Honors students SDTLA scores (Winston et al., 1999a).

These results appear to indicate that many of the characteristics associated with the description of Honors students are, in fact, correctly applied. The high levels of independence, academic and occupational goal orientation, responsibility, study habits, and time management would all appear to depict characteristics of Honors students and it could be surmised, could contribute to their academic achievement. However, it is unknown from the current study whether these students already possessed these characteristics, prior to their Honors program participation, or if the Honors program influences and actually helped to develop these characteristics. This conundrum is a bit like the chicken and the egg question, which came first? However, the purpose of the research question was to determine interaction effects not causation.

Classification and Gender, as a combination, resulted in significant interaction effects of both the Developing Autonomy (AUT) Task and Interdependence (IND) Subtask. This finding indicates that when Classification and Gender are considered together, their combination creates a significant interaction effect on college student's

ability to be independent, self-sufficient, time efficient, respectful, and responsible. In addition, the combination of Classification and Gender generates a significant interaction effect with the level of reciprocal participation with the community and institution (Winston et al., 1999a).

### **Research Question Three**

The correlation analysis, of the current study, yielded no significantly important relationships between the creativity measures of the TTCT and psychosocial development outcome scores of the SDTLA. The results indicate that the Cultural Participation Subtask (CP) seemed to show the highest relationship with any of the creativity measures, however the relationship was not moderate or high in value. This appears to point towards no significant relationship between the creativity and psychosocial development instruments.

It was thought that the CP Subtask would show significant correlation levels. This was due to the fact that this subtask is associated with an appreciation of and participation in cultural or artistic endeavors as well as spending time pursuing activities of special interest. An additional social or personal development measure, thought to possibly have a relationship with the creativity scales, was the Tolerance Subtask (TOL). This was considered a plausible relationship because the TOL subtask includes respect and acceptance of differences in others, in addition to valuing unconventional beliefs or ideas. However, the correlational analysis did not produce significant relationships in any component of the two instruments.

**Discussion**

The higher creativity scores of the Non-Honors students were not completely unexpected, due to the previously mentioned literature stating the characteristics of creative individuals as well as the lack of correlation between creativity and achievement measures. Non-Honors students obtaining significantly higher creativity scores is not surprising, due to the fact that creativity was not a component of admission into the Honors Program, and entrance into the program was based highly on achievement factors. Interestingly, neither the participation in GT programs nor taking a creativity course appeared to have interaction effects with any of the four measures of creativity. This seems to infer that participation in these activities may not have an impact on the strength of creativity scores.

**Limitations of the Study**

Several limitations of the study must be addressed, as the implications of the findings are considered. Selection bias or convenience sampling is one such limitation. The students who volunteered to participate self-selected into the study. Because random sampling was not feasible in the selection of the study participants, some differences shown in the results may have been due to the sample itself. These students may not have been a true representation of both Honors and Non-Honors students. The students were also taken from just four courses in two different colleges of the University. How representative were these students of all college students? Another

limitation is the relative homogeneity of the sample. The participants were overwhelmingly Caucasian and of traditional-age.

Another limitation of the study had to do with the instrumentation. The *Abbreviated Torrance Test for Adults* (ATTA) should have been utilized as the creativity instrument, instead of the TTCT. The students would have been able to complete the entire instrument, instead of merely completing two of the tasks on the Verbal Form of the TTCT. While the two tasks that were used in the study do provide representative creativity scores, taking the entire ATTA instrument would have given a more thorough picture of creativity and greater accuracy in the creativity scores.

While the SDTLA does provide extremely reliable test-retest correlations, it does only provide scores on three of the seven vectors of psychosocial development in Chickering's (1969) original and Chickering and Reisser's (1993) later revision of the theory. However, this was one of the best instruments available as the validity and reliability are high. There are no instruments available that currently assess all seven of Chickering's vectors.

An additional limitation of the current study has to do with the study design. A one-shot test design was used. Perhaps a better indicator of both creativity and personal and social development would have been a longitudinal study design. This would have provided additional data to determine changes over time, of the same sample, giving a more comprehensive determination if Honors programs actually impact a student's creativity and psychosocial development.

A lack of generalizability is another possible limitation of the current study. Only one school was used. If additional Universities were used it would increase the possibility of generalizing the results as well as making it possible to compare and contrast different regions of the country.

### **Topics for Future Research**

This study directs attention to the need for continued research addressing several topics. Additional research needs to address the needs of the creative college student. Additionally, research into the impact of Honors Programs on student outcomes is vital to understanding their impact and also for the continued justification for increasing funding and using the programs to attract students to an institution. Longitudinal studies, using both 2-year and 4-year Honors Programs would help add to the body of knowledge in Honors education effectiveness. Longitudinal studies that continue for several years post-graduation would also be helpful in understanding the long-term social, personal, and educational outcomes of Honors Programs. With regards to the relationship of creativity and Honors Programs, comparing programs that include creativity as a component of the application procedure to those programs that simply utilize achievement based measures for acceptance into an Honors Programs, would help illuminate if the use of creativity measures makes a difference in the overall creativity of the students.

As a result of the outcomes of this study, it may be necessary to evaluate the importance and methods of teaching creativity courses, in light of the fact that taking a

creativity course was not an interaction variable of creativity scores with these groups of students. In addition, because the participation in GT programs was not an interaction variable in either creativity or psychosocial development measures, longitudinal research into whether these programs should or are impacting creativity and psychosocial development may yield important information about Gifted and Talented programs.

Research with a larger sample of ethnically diverse students would provide additional information as to how different ethnic groups are impacted by Honors Programs. In addition, it was noticed that there might be a difference in racial and ethnic identification of the students participating. Further research into these areas of demographic classifications should be explored. The inclusion of additional choices of ethnicity would be increasingly important, as there are increasing numbers of international students attending institutions of higher education in the United States.

An additional topic for further research includes religious affiliation as a demographic variable. This would be important to determine if in fact there are any differences in different religions in creativity and psychosocial measures. In addition, this may provide important information in working with varied groups of students.

As an aside, after the administration of the instruments in one of the architecture courses, several female students from a branch campus in another country, who were the first allowed by their government to attend courses in the United States. These students mentioned that several of the questions did not fit with their culture and religious teachings and therefore they did not have answers to the questions. They also mentioned that they did not fit into any of the ethnic groups given in the demographic information.

This poses an opportunity for researchers to gain a greater understanding of both different cultures and different religions, as related to creativity and social development.

### **Synthesis**

This study provides opportunity for greater understanding of both Honors and Non-Honors students in relation to creativity and personal and social development. There are still many opportunities for further research into both the students that participate in as well as the programs and institutions that provide the Honors Programs. In looking at the percentage of students who are the top achievers, to what extent is it a problem that they did not score high on creative measures? Is it a systemic issue that needs to be addressed at a level higher than that of the individual Honors Programs? Are the highly creative students going to other kinds of schools or into other kinds of programs? What about the high achieving students participating in programs that do not have a system in place to reward creativity, i.e. Pre-Law, Pre-Medicine, etc. How does the emphasis on innovation in science and mathematics incorporate creativity into the educational system? Do Honors Programs create enough additive creativity, innovation, and achievement enough to warrant the continuation of massive financial and personnel support? Undoubtedly, the expenditure of increasingly limited resources and the continued growth of Honors Programs continue to expand without a complete understanding of the programs' impact on student outcomes. It is clear that many questions remain and continued research is warranted.

Continued research into these types of questions could have far reaching implications, not only to Honors Programs, but to policy decisions as well. The policies impacted could be not only in the higher education arena, but the elementary and secondary education systems.



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APPENDIX A  
CONSENT FORM

The Relationship between Creativity and Psychosocial Development among  
College Honors and Non-honors Students

I have been asked by Amy Dupré, from Texas A&M University, to participate in a research study that investigates the relationship between creativity and psychosocial development test scores among college honors and non-honors students. The purpose of this study is to determine whether there is a difference between honors and non-honors students on creativity and psychosocial development measures. This will increase understanding of college students who participate and do not participate in honors programs, as well as the impact of honors versus non-honors education in higher education.

I understand that the study is during the spring of 2006 and will involve approximately 200 students from Texas A&M University. If I agree to be in this study, I will be asked to complete two pencil and paper testing instruments, including two subtests of the *Torrance Tests of Creative Thinking*, Verbal Form B and the *Student Development Task and Lifestyle Assessment*. The total administration time should be approximately one hour, for both instruments. Multiple testing times will be available, so I will not need to make a separate trip to campus for the testing, unless I choose to do so.

I understand that participation in this study is voluntary and that there will be no compensations or risks. I understand that my responses in this study are confidential. An ID code will be assigned to me for both instruments. The records of this study will be kept private. I understand that the information gathered will be used for a dissertation and may be used for articles in professional journals and presentations. No identifiers linking me to the study will be included in any sort of report that might be published. Research records will be stored securely and only Amy Dupre' will have access to the records. My decision whether or not to participate will not affect my current or future relations with Texas A&M University. If I decide to participate, I am free to refuse to answer any of the questions that may make me uncomfortable. There are no consequences if I decide not to participate or choose not to respond to questions. I must be 18 years old or above to participate. There are no personal benefits or risks to participating in this study.

*I understand that this research study has been reviewed and approved by the Institutional Review Board-Human Subjects in Research, Texas A&M University. For research-related problems or questions regarding subjects' rights, I can contact the Institutional Review Board through Dr. Michael W. Buckley, Director of Research Compliance, Office of Vice President for Research at (979) 458-4067 (mwbuckley@tamu.edu).*

## CONSENT FORM, Continued

I have read and understand the above information. I have asked questions and have received answers to my satisfaction. I have been given a copy of this consent form for my records. By signing this document, I consent to participate in the study.

Subject's Printed Name \_\_\_\_\_

Subject's Signature \_\_\_\_\_ Date \_\_\_\_\_

I agree to conduct and report this study according to the described terms.

Signature of Investigator \_\_\_\_\_ Date \_\_\_\_\_

For more information about this study, you may contact:

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## APPENDIX B

## ADDITIONAL ACADEMIC BACKGROUND QUESTIONS

## Additional Questions

154. Are you now or have you been enrolled in a creativity class?

1 = No

2 = Yes

155. If you answered yes to the previous question, how many creativity classes have you taken?

1

2

3

4

5 or more

156. Are you a first generation college student?

1 = No

2 = Yes

157. Did you participate in gifted and talented education programs in school?

1 = No

2 = Yes

158. If you answered yes to the previous question, which level? (Indicate the highest Level in which you participated)

1 = Elementary School

2 = Middle School

3 = High School

For 159 through 162, please write in the answer on the line.

159. SAT/ACT Score \_\_\_\_\_

160. High School Rank \_\_\_\_\_ out of \_\_\_\_\_

161. Overall college Grade Point Ratio \_\_\_\_\_

162. College Major \_\_\_\_\_

163. Are you an Honors Student?

1 = No

2 = Yes



## APPENDIX C

*TORRANCE TESTS OF CREATIVE THINKING*

## T-TEST RESULTS TABLE

	Group	N	Mean	SD	t	p
Fluency Standard Score	Honors	120	72.2583	8.10591	2.782	.006
	Non-Honors	164	75.5976	12.10218		
Flexibility Standard Score	Honors	120	65.1917	5.63944	.860	.391
	Non-Honors	164	65.8415	7.08921		
Originality Standard Score	Honors	120	73.9917	11.8183	2.491	.013
	Non-Honors	164	77.9756	15.12320		
Creativity Average Score	Honors	120	70.5417	7.94825	2.121	.035
	Non-Honors	164	72.9329	11.04654		

(p &lt; .05)

## APPENDIX D

*STUDENT DEVELOPMENT TASK AND LIFESTYLE ASSESSMENT*

## T-TEST RESULTS TABLE

	Group	N	Average Mean	Average SD	t	p value
Establishing and Clarity of Purpose Task Square Root	Honors	120	7.2754	.63905	-5.18105	.000000
	Non-Honors	164	6.8473	.74389		
Educational Involvement Subtask Square Root	Honors	120	7.2156	.66850	-5.06846	.000000
	Non-Honors	164	6.7793	.76628		
Career Planning Subtask Square Root	Honors	120	7.347	.65498	-4.48442	.00001
	Non-Honors	164	6.9763	.70809		
Lifestyle Planning Subtask Square Root	Honors	120	7.3303	.62843	-3.58132	.0004
	Non-Honors	164	7.0369	.73452		
Cultural Participation Subtask Square Root	Honors	120	7.0155	.80829	-2.25801	.02471
	Non-Honors	164	6.8057	.74597		
Developmental Autonomy Task Square Root	Honors	120	7.3278	.61401	-6.98241	.000000
	Non-Honors	164	6.7438	.79446		
Emotional Autonomy Subtask Square Root	Honors		7.0054	.73939	-2.97296	.003206
	Non-Honors	164	6.7071	.92924		

*STUDENT DEVELOPMENT TASK AND LIFESTYLE ASSESSMENT*

T-TEST RESULTS TABLE, Continued

	Group	N	Average Mean	Average SD	t	p value
Interdependence Subtask Square Root	Honors	120	7.1697	.64749	-4.72849	.000004
	Non-Honors	164	6.7904	.6768		
Academic Autonomy Subtask Square Root	Honors	120	7.5501	.64110	-8.37775	.00000
	Non-Honors	164	6.8261	.81007		
Instrumental Autonomy Subtask Square Root	Honors	120	7.3643	.54546	-5.0149	.0000
	Non-Honors	164	6.9719	.77054		
Mature Interpersonal Relationships Task Square Root	Honors	120	7.0406	.80912	-2.94059	.003547
	Non-Honors	164	6.7408	.8754		
Peer Relationships Subtask Square Root	Honors	120	7.0688	.77208	-2.39953	.01707
	Non-Honors	164	6.8301	.87245		
Tolerance Subtask Square Root	Honors	120	7.0604	.70619	-2.68018	.00791
	Non-Honors	164	6.811	.81976		
Salubrious Lifestyle Scale Square Root	Honors	120	7.4226	.65814	-4.46571	.000012
	Non-Honors	164	7.0424	.73066		

(p &lt; .05)

## APPENDIX E

## MANOVA RESULTS TABLES

## Multivariate Tests Table – Data Set 1

	Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	Observed Power
Intercept	.000	68304.071	18.000	235.000	.000	1.000	1.000
Ethnicity	.673	1.847	54.000	701.024	.000	.124	1.000
Classification	.613	2.319	54.000	701.024	.000	.151	1.000
Honors	.827	2.729	18.000	235.000	.000	.173	.998
First Generation College Student	.913	1.250	18.000	235.000	.223	.087	.826
GT Participation	.915	1.211	18.000	235.000	.253	.085	.810
Creativity Class	.879	1.793	18.000	235.000	.027	.121	.956
Gender	.809	3.091	18.000	235.000	.000	.191	.999
Class * Gender	.695	1.683	54.000	701.024	.002	.114	1.000
Honors * Gender	.946	.740	18.000	235.000	.768	.054	.536
First Generation College Student * Gender	.955	.615	18.000	235.000	.887	.045	.442
GT * Gender	.947	.727	18.000	235.000	.781	.053	.527
Creativity Class * Gender	.938	.857	18.000	235.000	.632	.062	.617

(p &lt; .01)

Multivariate Tests Table – Data Set 2

	Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	Observed Power
Intercept	.000	67263.415	18.000	235.000	.000	1.000	1.000
Ethnicity	.660	1.939	54.000	701.024	.000	.129	1.000
Classification	.614	2.312	54.000	701.024	.000	.150	1.000
Honors	.837	2.535	18.000	235.000	.001	.163	.996
First Generation College Student	.902	1.416	18.000	235.000	.125	.098	.882
GT Participation	.923	1.094	18.000	235.000	.359	.077	.756
Creativity Class	.888	1.643	18.000	235.000	.051	.112	.934
Gender	.814	2.989	18.000	235.000	.000	.186	.999
Class * Gender	.717	1.533	54.000	701.024	.010	.105	1.000
Honors * Gender	.941	.815	18.000	235.000	.682	.059	.589
First Generation College Student * Gender	.959	.561	18.000	235.000	.925	.041	.400
GT * Gender	.951	.671	18.000	235.000	.838	.049	.485
Creativity Class * Gender	.935	.935	18.000	235.000	.577	.065	.646

(p &lt; .01)

Multivariate Tests Table – Data Set 3

	Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared	Observed Power
Intercept	.000	67423.197	18.000	234.000	.000	1.000	1.000
Ethnicity	.719	1.515	54.000	698.044	.012	.104	1.000
Classification	.630	2.172	54.000	698.044	.000	.143	1.000
Honors	.833	2.598	18.000	234.000	.001	.167	.996
First Generation College Student	.899	1.458	18.000	234.000	.106	.101	.893
GT Participation	.910	1.282	18.000	234.000	.201	.090	.838
Creativity Class	.895	1.522	18.000	234.000	.083	.105	.909
Gender	.812	3.003	18.000	234.000	.000	.188	.999
Class * Gender	.703	1.625	54.000	698.044	.004	.111	1.000
Honors * Gender	.943	.793	18.000	234.000	.708	.057	.573
First Generation College Student * Gender	.956	.596	18.000	234.000	.901	.044	.427
GT * Gender	.952	.653	18.000	234.000	.855	.048	.471
Creativity Class * Gender	.935	.906	18.000	234.000	.572	.065	.649

(p &lt; .01)

## APPENDIX F

TTCT AND SDTLA CORRELATION TABLE

		Fluency Standard Score	Flexibility Standard Score	Originality Standard Score	Average Standard Score
Establishing and Clarifying Purpose Standard Score Square Root	Average Correlation	.1437*	.1683**	.1427*	.1557*
Career Planning Standard Score Square Root	Average Correlation	.0083	.0607	-.03	.0047
Educational Involvement Standard Score Square Root	Average Correlation	.0397	.073	.0633	.0613
Cultural Participation Standard Score Square Root	Average Correlation	.2524**	.2403**	.277**	.2587**
Lifestyle Planning Standard Score Square Root	Average Correlation	.1277	.1387*	.1003	.132
Developing Mature Interpersonal Relationships Standard Score Square Root	Average Correlation	.0853	.0363	.1123	.0977
Tolerance Standard Score Square Root	Average Correlation	.1297	.0933	.1687**	.1493*
Peer Relationships Standard Score Square Root	Average Correlation	-.0243	-.073	-.023	-.026
Developing Autonomy Standard Score Square Root	Average Correlation	.067	.079	.0837	.0873
Instrumental Autonomy Standard Score Square Root	Average Correlation	.0997	.0717	.0627	.085
Emotional Autonomy Standard Score Square Root	Average Correlation	.0673	.0637	.1173	.094
Academic Autonomy Standard Score Square Root	Average Correlation	-.016	.0263	-.0087	.0183
Interdependence Standard Score Square Root	Average Correlation	.062	.0813	.0707	.0707
Salubrious Lifestyle Standard Score Square Root	Average Correlation	-.0613	.0247	-.096	-.047

\*  $p < .05$ , \*\* $p < .01$

## VITA

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