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Creative Thinking In Male And Female Vietnamese, Filipino, And Anglo-American College Undergraduate Students, As Measured By The Torrance Tests Of Creativity

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Creative Thinking in Male and Female Vietnamese,
Filipino, and Anglo-American College Undergraduate Students,
as Measured by the Torrance Tests of Creativity

A Dissertation
Presented to
the Faculty of the Graduate School
University of the Pacific

In Partial Fulfillment
of the Requirement for the Degree
Doctor of Education

by
Peter Chu-Quang-Minh

August, 1980

Creative Thinking in Male and Female Vietnamese,
Filipino, and Anglo-American College Undergraduate Students,
as Measured by the Torrance Tests of Creativity

Abstract of Dissertation

Purpose: The purpose of this study was to examine (a) the degree of creative thinking of Vietnamese, Filipino, and Anglo-American college undergraduate students as measured by the Torrance tests of Thinking Creatively with Pictures (TCWP), form A, and Thinking Creatively with Words (TCWW), form A; (b) the degree of creative thinking between males and females in the three groups of students tested; and (c) the differences, if any, between the TCWP scores and the TCWW scores of the Vietnamese, Filipino, and Anglo-American college undergraduate students tested.

Procedure: A sample of 15 males and 15 females in each ethnic group was randomly selected from the total Vietnamese, Filipino, and Anglo-American college undergraduate students who enrolled in one university and two colleges in Northern California in the Spring semester of the 1979-80 academic year. The TCWP and the TCWW were administered to students in each group; the T-scores were used in the data analyses. Ex post facto design was used in this study because it was not possible to manipulate the independent variables, namely, ethnicity and sex. The level of significance for rejecting the null hypotheses was set at .05. Statistical techniques used in this study were the two-way ANOVA and the Pearson product-moment correlation.

Conclusions: The findings of this study indicated that: (a) the Filipino college undergraduate students scored higher on figural Fluency than the Vietnamese college undergraduate students; (b) females had higher figural Fluency scores than males; (c) the Anglo-American college undergraduate students scored higher on figural Flexibility than the Filipino college undergraduate students; (d) males had higher figural Originality scores than females; (e) the Anglo-American college undergraduate students scored higher on figural Elaboration than either the Filipino or the Vietnamese college undergraduate students; (f) there was no correlation between the TCWP scores and the TCWW scores on the factors of Fluency and Flexibility, but a moderate positive correlation was found in the Originality scores among the three ethnic groups tested.

Recommendations: (a) additional studies should be conducted using samples of other ethnic groups such as Chinese, Laotian, Korean, and Japanese to verify findings in this study and to further examine cultural differences and the influence of specific cultural traditions; (b) an in-depth study, isolating specific cultural elements in the Vietnamese, Filipino, and American cultures should be undertaken to determine which traditions, mores, and values have the greatest influence on creativity.

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Chapter I

The Problem and Definition of Terms

I. Introduction

Creative thinking is one of the most valuable characteristics of the human being and perhaps one of the most difficult to be investigated. It is one of the most valuable characteristics because creative thinking expresses the uniqueness or originality of a person's thinking and actions. It is also one of the most difficult abilities to study because "a person can behave creatively in an almost infinite number of ways" (Torrance, 1974).

Though many authors such as Galton (1869), Terman (1925), and Cox (1926) may be considered pioneers in developing the understanding of creativity, Guilford (1965) can be credited with conducting the earliest programmatic investigation of the concept. He proposed that intellectual ability could be understood in terms of distinct intellectual operations which are convergent production and divergent production. The former is the generation of information from given information in which conventionally the best answers are emphasized. The latter is the generation of information in which quality and variety of answers are emphasized. Divergent production shows fluency, flexibility, originality, relevance, quality, and discipline (Meeker, 1974).

Getzels and Jackson (1962), in identifying creative children, devised a number of techniques and based their research program on these techniques. For example, children were asked to give as many definitions as possible

for common words such as "bolt" or "bark." Creative ability was inferred from the number of associations and the number of categories into which definitions could be grouped.

Torrance (1965) reviewed and further investigated the problem of creativity in young students. Based on Guilford's factors, Torrance has devised what are called the Torrance Tests of Creative Thinking (TTCT). These tests purport to measure the factors of Fluency, Flexibility, Originality, and Elaboration.

Because of the complexity of the process of creativity, many definitions have been stated by a variety of authors. These definitions all have some common characteristics such as originality or uniqueness; the outcome of a creative work is something new but this newness usually takes root in old experiences.

As for the relationship between creativity and intelligence, Guilford (1967) concluded from his research that, though high IQ may be seen as a necessary condition for high divergent production, it is not a sufficient one. Getzels and Jackson (1962) and Wallach and Kagan (1965) have compared and contrasted characteristics of IQ and creativity in children. After elaborate studies, the first two authors concluded that (a) the intelligence quotient and creativity are uncorrelated at higher levels of intelligence; (b) high-creativity students are less known and liked by their teachers than high-IQ students; (c) high-creativity students are socially non-conforming and more independent than high-IQ students; and (d) highly-creative students are also less success-oriented than high-IQ students.

The main difference between creativity and problem solving resides in the fact that creativity calls for originality while problem solving

does not. In the latter, prior to the findings of the investigator, someone already knows the right answer for the problem; the answer is already there, just unknown to the person who is solving the problem. In the former, on the contrary, a new and unique combination of existing elements will produce what does not exist in many minds or thoughts prior to the thinking and doing of the actor himself.

An additional difference between creative thinking and critical thinking is noted by Russell (1956) who asserted that critical thinking involves reactions to others' ideas or to one's own ideas whereas creative thinking involves producing new ideas; that is, creative thinking tends to achieve something which does not coincide with previously determined conditions.

To investigate the creative personality, two approaches are under consideration. The first one is the holistic approach of which Maslow was generally recognized as its first representative. He stressed that the creative person must be considered holistically rather than atomistically, functionally rather than taxonomically, dynamically rather than statistically. Holistic creativeness "stressed first the personality rather than its achievements" (Maslow, 1968, p. 145). The second approach is the specific traits one. In this approach, a number of characteristics are considered as differentiating the highly creative person. Hirsh (1931) enumerated six personality traits of the creative person while Torrance (1962) compiled a list of eighty-four creative features, including positive and negative ones. Some of these traits or features are making mistakes, oddities of habits, keeping unusual hours, persistence, courage, sincerity, introversion, altruism, constructiveness, originality, and speculation.

An author who has dealt with relationship between culture and creative thinking is Yacorzynski (1954). He stated that the evidence for the belief that creativity --the desire for self-expression-- is the all-prevalent urge of man "is limitless in scope" (p. 181). The human being is capable of adjusting himself/herself to his/her environment or to the culture and progressing toward his/her full development. To say it differently, culture exerts some limits upon a human being's behavior and feelings, but when a person accepts his/her culture, he/she may expect that this acceptance becomes a way for him/her to attain his/her self-expression or his/her creative urge in his/her own cultural direction. If culture varies from society to society, then creativity will also vary from culture to culture with different degrees. In the next few paragraphs, some distinguishing features of Vietnamese, Filipino, and Anglo-American cultures will be briefly presented.

For thousands of years the Vietnamese have been greatly influenced by Confucianism which stressed a close relationship between members of the cultural group. Traditional rural society was usually restricted to the village surrounded by a thick living bamboo hedgerow. Regional differences were great because of a lack of communication between self-sufficient and isolated villages. A typical Vietnamese tends to feel comfortable only when he is a part of his/her large family circle. Smile for all occasions, that is the Vietnamese way. Most of the Vietnamese are very familiar with these words of the famous poet, Nguyen-Du:

Within us each there lies the root of good:

The heart means more than all talents on earth

(translated by Huynh Sanh Thong, 1973)

The Vietnamese culture tends to foster loyalty, family cooperation, and

social conformity rather than adventurous performance, individual competition, and diversity in thinking. With regard to the Vietnamese educational system, it might be seen as fostering rote learning because "Vietnamese students are accustomed to having their teachers deciding everything for them" (Duong, 1975, p. 4). In addition, Vietnamese students --at least up to the 1930's--learned "only Chinese, not Vietnamese, history" (Tran, 1978, p. viii).

The Filipino culture shares many cultural traits with the Vietnamese culture. Though the Philippines comprises more than seven thousand islands and has a long history of numerous waves of immigrations, its common cultural characteristics are relatively simple (Catapusan, 1940). Obedience to authorities is considered a universal good. The Filipinos are peaceful, law abiding, and loyal to the groups of which they are members. Suppression of individuality is evident in this culture (Bulatao, 1963; Hollnsteiner, 1963; Guthrie, 1966). Most parents have the right to control all aspects of their children's behavior. Young persons are usually expected to think and to behave as all others of their age do. Sechrest (1969) found that the Filipino sees his/her identity in his/her family connections rather than as an individual in his/her own right. He/she is very dependent on the decisions of others because he/she is sometimes excessively eager to please authority figures, especially family figures.

When talking about the Filipino educational system, Bulatao (1969) pointed out that rote learning was considered as the best method of transferring knowledge and conduct. What a student was asked for was not how to analyze the problem, depending on his own judgement, but rather, how to faithfully repeat what he/she was told by his/her teacher. In

addition, a person is rarely welcomed because of his/her original way of life, most frequently he/she is accepted because of his/her conformity to customs and traditions set by his old generations.

With regard to American culture, Rogers (1961) viewed it as fostering conformity and stereotypes; that is, students in this country are taught how to "complete" their education rather than how to become freely creative and original in their thinking. In Rogers' words, "To be original, or different, is felt to be 'dangerous'" (p. 348). According to Jacob (1956), college experience is to "'shape-up' his values so that he can fit comfortably into the ranks of American college alumni" (p. 6). There are other ways of looking at American culture, however.

The Constitution of the United States, written in 1787, states: "We the people of the United States, in order to form a more perfect union, . . . and secure the blessings of liberty to ourselves and our posterity, do ordain and establish this Constitution for the United States of America". Liberty and freedom, moreover, were definitely linked to democracy which was seen as "a social process for achieving man's highest goals" (Tanner & Tanner, 1975, p. 219). In addition, the American culture welcomes the thoughts presented by people such as Galton (1869) and Lombroso (1891). In doing so, this culture has motivated researchers who devoted their time and energy to the study of intelligence and creativity such as Terman (1925), Cox and her colleagues (1926), and Guilford (1956). Parson (1977) stated that "the creative-innovative aspect of the educational system [in the United States] has increased its momentum" (p. 191). With Getzels and Jackson (1962), Torrance (1965), and a variety of other authors, American society and culture may be seen as leading in the area of nourishing creative process.

Another factor to be considered in this work is the relationship between sex and creative thinking. There are relatively few studies in this field and different definitions of creativity lead to different outcomes. Girls have been found to be inferior to boys in some creative aspects but also superior in some others. They were lower than boys in their ability to "break set" or restructure a given problem, in a variety of intellectual activities and in realizing their creative output and occupations (Macobby, 1966). On the contrary, girls were superior to boys in performing divergent tasks, and in getting better grades throughout their school years (Maccoby, 1966). Creative women mathematicians showed more simplification and integration in life than creative men mathematicians did (Maccoby, 1966; Treambly, 1964; Klausmeier & Wiersma, 1964; Helson, 1976). This study proposes to find out if any differences in creative thinking exist in male and female Vietnamese, Filipino, and Anglo-American college undergraduate students.

II. The Problem

Many approaches to the study of creativity have been made over the years. The definition of creativity itself has been difficult to develop and obtain agreement on. One persistent question has been the effect of various environmental factors on the development of creativity. Different cultures stress different values, and emphasize different behaviors as being "correct." Some of these values may result in more convergent types of thought and behaviors while others may result in divergent thought processes and behaviors. Artists and creative people develop in all cultures, however, and there is little research data available that show culture and creativity are related. Is there a relationship between culture and creativity? If so, does it differ in its effect on the two

cultures, that is the Anglo-American culture and the Oriental culture? To say it differently, are there any differences in creative thinking between the male and female Anglo-American college undergraduate students and the male and female Vietnamese and Filipino college undergraduate students?

III. Purpose and Significance of the Study

Purpose of the Study

It was the purpose of this study (a) to investigate and compare the degree of creative thinking of Vietnamese, Filipino and Anglo-American college undergraduate students as measured by the TTCT; (b) to examine the correlation of creative thinking between males and females in all these three groups of students; and (c) to determine the differences, if any, of the two sub-tests of the TTCT among Vietnamese, Filipino, and Anglo-American college undergraduate students.

Significance of the Study

Though many researchers have investigated creative thinking, this study is the first attempt to determine empirically the creative thinking of Vietnamese college undergraduate students who are now living in the United States. It is also the first time in the history of educational research that an attempt has been made to compare creative thinking among the Vietnamese, Filipino, and Anglo-American college undergraduate students. The results of this study may enable educators and lay people to better understand Vietnamese, Filipino and Anglo-American college undergraduate students, regarding their creative thinking abilities as defined by Torrance and examined by the TTCT. It is recognized that some writers feel that the Vietnamese in the United States are "marginal people" and not representative of all Vietnamese; however, the students in the study are representative of Vietnamese living in the United States. As such, the

findings of this study are important in providing information which can be used to help them in adapting to the United States culture.

IV. Research Methodology

This study is concerned with test score analyses in an attempt to investigate the degree of creative thinking in the three groups of students and between males and females in these groups; consequently, the research methodology was that of ex post facto design. In ex post facto research, the investigator takes things as they are. As Sax (1968) stated, it is experimental because an attempt is made to infer causal relationship; it is also descriptive in the sense that the researcher has no direct control of experimental conditions. To say it in other terms, in its approach to a problem, ex post facto is neither completely experimental nor is it completely descriptive.

The ex post facto design is defined by Kerlinger (1964) as a design in which the independent variable(s) have already occurred and in which the investigator starts with the observation of dependent variable(s); then he examines the independent variables in retrospect for their possible relations to and effects on the dependent variable(s). These variables are factors already present in the studied population. It is the researcher's responsibility to determine which variables exert the greatest impact upon a particular factor being researched, and whether there is a causal relationship among them.

The ex post facto design has an inherent weakness which is its inability to point out accurately and to interpret thoroughly causality (Kerlinger, 1964). In this study, one cannot say definitely what the relationship between creative behavior and students identified as Vietnamese, Filipino, or Anglo-American is from a causal perspective; that is, did being Filipino cause one group to respond in a particular way or was some

other variable interacting to "cause" them to respond differently from the other two groups?

In discussing the limitations of ex post facto interpretations, Kerlinger (1964) stated that it had three major weaknesses which are (a) the inability to manipulate independent variables, (b) the lack of power to fully randomize, and (c) the lack of thorough control, hence the risk of improper interpretation. However, he also pointed out some of the values of this design by saying that many important variables in educational research are not manipulable, such as creativity, intelligence, aptitude, home background, parental upbringing, teacher personality, and school atmosphere. Though many important social scientific problems and educational research problems lend themselves to controlled inquiry of the ex post facto design, they do not lend themselves to experimentation. The ex post facto research design is the appropriate method of educational research for this study because the dependent variable, creativity, is one which is difficult to manipulate experimentally but which does exist ubiquitously in all humans, thus deserving study.

V. Assumption and Limitation

Assumption

The assumption upon which this study was based was that male and female Vietnamese, Filipino, and Anglo-American college undergraduate students who enrolled in the University of the Pacific, Stockton, the San Joaquin Delta College, Stockton, and the Modesto Community College, Modesto, California, have a normal creative potentiality and capacity as compared to all other male and female Vietnamese, Filipino, and Anglo-American college undergraduate students who enroll in all other colleges and universities in the United States.

Limitation.

The investigation was also based upon limitations which were those set by including in the study only those male and female Vietnamese and Filipino college undergraduate students who are now living in the United States; and only those male and female Anglo-American college undergraduate students who are white and non-Spanish speaking.

VI. Definitions of Terms Used

The following definitions of terms have been used throughout this study:

1. Vietnamese college undergraduate students: Those Vietnamese students who are engaged in study toward a Bachelor's degree and who were born in Vietnam; are now living in the United States, and are still speaking their mother language at home.
2. Filipino college undergraduate students: Those Filipino students who are engaged in study toward a Bachelor's degree, and who were born in the Philippines; are now living in the United States, and are still speaking their mother language at home.
3. Anglo-American college undergraduate students; Those Anglo-American students who are engaged in study toward a Bachelor's degree and who are white, non-Spanish speaking, and were born in the United States. Moreover, English must be their mother language.
4. Creativity: The behavior measured by the TTCT, figural form A and verbal form A. Torrance defined creativity as "a 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, 1974b, p. 8).

5. Fluency: A sub-test of the TTCT which measures "the production and association of many ideas in a given period of time" (Torrance, 1965, p. 298).
6. Flexibility: A sub-test of the TTCT which "enables a person to keep out of ruts by jumping readily from one train of thought to another in thinking of new uses for devices or products" (Torrance, 1965, p. 303).
7. Originality: A sub-test of the TTCT which "involves the production of clever or uncommon responses to specific situations" (Torrance, 1965, p. 75).
8. Elaboration: A sub-test of the TTCT which measures the ability "to develop, embroider, embellish, carry out, or otherwise elaborate ideas" (Torrance, 1965, p. 75).
9. Divergent thinking: A creative behavior measured by the TTCT, figural form A and verbal form A. If a student's answers to the test items cover many different categories of drawing and writing as set by Torrance (1972, 1974a), his answers will be classified as divergent. Guilford (1967) defined divergent production (thinking) as "the generation of information from given information where the emphasis is upon variety and quantity of output from the same source" (p. 214).
10. Convergent thinking: A creative behavior measured by the TTCT, figural form A and verbal form A. If a student's answers to the test items are restricted to a few categories of drawing and writing as set by Torrance (1972, 1974a), his answers will be classified as convergent.

Guilford (1967) defined convergent production (thinking) as "the generation of information from given information, where emphasis is on a single response in terms of commonly accepted criteria" (p. 214).

11. Conformity: A tendency of a student tested to answer as other students do. It is a disposition of "trying to live according to what was meaningful to other people" (Rogers, 1961, p. 169).
12. Culture: Symbolic patterning of attitude and behavior as manifested in the way the Vietnamese, Filipino, and Anglo-American college undergraduate students, in particular, and people in general, respond to stimuli. Culture is basically a form or pattern or way of life, even a culture trait is an abstraction (White, 1972).

VII. Research Hypotheses

The statement of the problem related earlier to this chapter is now restated in the form of research hypotheses tested in this study. The hypotheses listed below are restated in chapter IV in the null form.

H_1 : There will be a difference in creativity between Anglo-American college undergraduate students and Vietnamese and Filipino college undergraduate students as measured by the Torrance test of Thinking Creatively with Pictures (TCWP).

H_2 : There will be a difference in creativity between Anglo-American college undergraduate students and Vietnamese and Filipino college undergraduate students as measured by the Torrance test of Thinking Creatively with Words (TCWW).

H_3 : There will be a difference in creativity between males and females within the three groups of students tested.

H₄: There will be a correlation between the TCWP scores and the TCWW scores in all the three groups of students tested.

VIII. Summary

This chapter includes an introductory statement to the dissertation, states the problem, specifies the significance of the research, outlines the assumptions and limitations of the study, and defines those terms deemed important to the hypotheses developed.

Four additional chapters are included in the study. Chapter II reviews the literature related to this study. This chapter includes the concept of creativity, the impact, if any, of culture on creative thinking, the relationship between sexes and creative thinking, and measurements of creativity.

Chapter III describes the design and the selection of the samples, selection and administration of the instruments, description of the instruments, the research methodology and the statistical procedures. Chapter IV describes the findings of the study regarding the degree of creativity in the three groups of students and in the two sexes in each group. This chapter also describes the correlation between the TCWP and the TCWW scores in the three sub-groups. Chapter V contains the conclusions based upon the investigation and recommendations for further study.

Chapter II

Review of the Literature Related to this Study

The literature reviewed for this study is organized under four main headings: (a) the concept of creativity, (b) culture and creative thinking, (c) sex and creative thinking, and (d) measurement of creativity. There is a dearth of research, however, in areas regarding cross-cultural creative thinking, the relationship between creative thinking and sex, and also in the area of creativity measurement.

I. The Concept of Creativity

Under this heading the three following points will be presented: development and definitions of creativity; creativity in regard to some other intellectual capacities; and finally, the creative personality.

Development and Definitions of Creativity

Over the centuries, hundreds of articles and books have been written about creative people, their personalities, their works, and their lives. Sophocles with Oedipus, Homer with The Iliad, Rousseau with Emile, and numerous other authors are worthy of being classified creative because of the originality and uniqueness of their works. As early as 1869, Galton, in his Hereditary Genius, completed research regarding the frequency of eminence among nearly 1,000 British men who had lived between 1786 and 1868. His subjects included statesmen, soldiers, writers, poets, artists, scientists, and ministers. Based upon his study, he concluded that intellectual or creative abilities were largely inherited.

In 1891, Lombroso, an Italian scientist, published The Man of the Genius, in which he concluded that genius is an aberration from the normal and similar to other mental aberrations. His work has had the unlucky effect of perpetuating the belief that giftedness and creativity are indications of emotional instability (Martindale, 1971; Lichtenstein, 1971). Despite evidence to the contrary, this concept of the unusually bright or creative person being aberrant remains widespread.

In 1926, Cox and her colleagues, using developmental norms as a guide, estimated the IQs of famous men such as Washington (IQ: #135), Mozart (#155), Voltaire (#180), Liebnitz (#190), or Goethe (#200). She also developed a series of character ratings. Statistical analyses of character ratings for 300 geniuses yielded a trait profile characteristic of youthful geniuses who achieved eminence. They were of positively valued traits, including sense of humor, self-esteem, trustworthiness, impulsive-kindness, and unconventionality. Maslow (1970) identified many of these same traits with creative people in his later studies.

In regard to the identification of gifted children, Terman (1925) undertook a massive study of more than 1,500 gifted children selected from a total school population of about 250,000 southern California children. These children were studied from many perspectives. In addition to extensive psychometric testing, anthropometric measurements were taken as well as medical, family, and educational histories. Subjects of the original study have been followed throughout their lives. Based upon Terman's findings, Suran and Rizzo (1979) confirmed that identification should include some combination of (a) group and individual intelligence testing, (b) educational achievement, (c) family history, and (d) observation of physical, social and personality characteristics. What was

discovered by Terman, though not directly dealing with creativity, may be regarded as a major contribution in investigating talented people whose creative works are highly evidenced in many instances.

Additional important research dealing with the identification of creative children was represented by the work of Getzels and Jackson (1962). The two investigators devised a number of techniques for identifying creativity and based their research program on these techniques. They asked children to give as many definitions as possible for common words such as "bolt" or "bark." Creative ability was inferred from the number of associations and the number of categories into which definitions could be grouped. They also used Guilford's tests and required children to think of as many uses as possible for an object, such as uses for a toothpick or a brick. Those who produced many and unusual uses for these objects were viewed as creative.

Guilford (1956) can be credited with being the earliest programmatic investigator of creativity. Through elaborate experimental procedures, he devised a model of intellectual functioning in which different abilities were identified and reduced to specific components. Guilford proposed that intellectual ability could be understood in terms of distinct intellectual operations. These include convergent and divergent production. "Convergent production is in the area of logical deductions or at least the area of compelling inferences" (Guilford, 1967, p. 171). Divergent production, on the other hand, is a type of thinking in which considerable searching about is done, and a number of answers will do (Guilford, 1959).

Meeker (1974) explained Guilford's structure of intellect and contended that convergent production is the generation of information from

given information, where achieving conventionally best answers is emphasized. In addition to this, convergent thinking involves thinking toward one right answer, or toward a relatively uniquely determined answer (Guilford, 1959). The term "convergent thinking" derives from the fact that intellectual operations converge on a predetermined correct answer, such as arriving at the solution of an arithmetic problem, completing a logical syllogism, or discovering components of a chemical solution.

In contrast to convergent production, divergent production is the generation of information where a variety and quality of the answers are emphasized. Divergent production should show fluency, flexibility, and originality, as well as quality, relevance, and discipline (Meeker, 1974). Divergent thinking does not lead to a single, correct solution; rather, it opens up novel ways of conceiving the world, identifies new problems, and leads in directions that could not be predicted prior to the thinking itself.

If Guilford has been seen as the founding architect of "divergent production" in the field of creativity, Maslow (1970) could be credited as the first "mental health theoretician" of creativity, because Maslow viewed creativity as an outcome of good mental health and progress toward self-actualization. According to him, the creativeness of the self-actualized person seems to be similar to the naive and universal creativeness of unspoiled children. Maslowian creativeness, as an expression of healthy personality, is projected out upon the world or touches whatever activity the person is engaged in. In this sense, there can be creative clerks, or shoemakers, or carpenters. Creative work, according to Maslow, is that in which the creative person reveals his direct way of looking at

life, his freshness and "naivete" in contacting the world. He describes freshness in appreciation by emphasizing the fact that the self-actualizing person rejects being rubricized, so that the unique aspects of his attention, perception, learning, and thinking are most prominent.

Torrance (1965), one of the leading researchers in creativity, reviewed and further investigated the problem of creativity. He has collected valuable data about creative potentialities of the youngster and about the factors in the scholastic system that hinder creativity; and he has made valuable suggestions about promoting whatever creative tendencies the young student happens to have (Torrance, 1962, 1965, 1969; Torrance & Myers, 1972). He has also devised what are called the Torrance Tests of Creative Thinking. The test scores a testee receives are related to Guilford's factors of Fluency, Flexibility, Originality, and Elaboration.

Torrance (1965) related Fluency to the production and association of many ideas in a given period of time. Flexibility in thinking was defined as enabling a person to keep out of ruts by jumping readily from one train of thought to another in thinking of new uses for devices or products. Originality was defined as the production of clever or uncommon responses to specific situations while Elaboration reflected the testee's ability to develop, embroider, carry out, or otherwise elaborate ideas.

With regard to the relationship between creativity and fantasy, Torrance (1965) stated that such a relationship has become the main objective of psychological investigation, and empirical evidence supporting the intuitive insight of poets and artists is increasing considerably. Since the tests of creativity call for unconventional or unique responses, rather than "right" answers, it would appear that the person who has a

rich fantasy life would be at an advantage. As a matter of fact, fantasy life may exist everywhere in every people; creativity, therefore, can be seen as a ubiquitous characteristic of human beings, though with different degrees in different people. According to Wing (1967), "creativity knows no social, ethnic, religious, or geographical boundaries" (p. 183). To conclude his study regarding self-actualizing people, Maslow (1970) wrote that creativeness is "a universal characteristic of all the people studied or observed. There is no exception. Each one shows in one way or another a special kind of creativeness or originality or inventiveness that has certain peculiar characteristics" (p. 170). Reviewing Maslow's study, Gallagher (1975) reached the same conclusion when he stated that Maslow's study "must be the basis for a more universal science of psychology" (p. 244). Arieti (1976) contended that creativity may occur at anywhere and at any age of life; "We must remember that creativity is recommended for all ages" (p. 379). In the same line of thought, Guilford (1967) stated that "the range of creative performances in daily life is very great" (p. 162).

In summary, creativity appeared in the history of human evolution thousands of years ago. A programmatic investigation of creativity, however, is still in its infancy though creative ability factor can be seen as knowing "no social, ethnic, religious, or geographical boundaries".

Definition of Creativity

As previously presented, the thinking process called creativity is a complex one. Because of its complexity, creativity has been defined and redefined hundreds of times from many different viewpoints. It might be said that the defining of creativity seems impossible for the present time (Callahan, 1978). In 1960, Smith described creativity as "sinking

down taps into our past experiences and putting these selected experiences together into new patterns, new ideas or new products" (p. 4). McKinnon (1963) elaborated on this definition and stated that creativity involves a response that is novel or at least statistically infrequent. But novelty or originality of thought and action is not sufficient. If a response is to lay claim to being a part of the creative process, it must be adaptive to reality; that is, it must serve to solve a problem, or fit a situation. True creativity involves an evaluation and elaboration of the original insight, a sustaining and developing of it to the full.

With respect to Guilford's Structure of the Intellect Model (Guilford & Merrifield, 1960), it might be expected that all operations of the intellect are involved to some degree in creative thinking. Divergent thinking and the ability to effect transformations of information are dominant aspects of creative thinking with the ability of fluency, flexibility, elaboration, redefinition and evaluation playing an important role.

Marksberry's (1963) classification of creativity included producing unique communication, solving problems, and deriving sets of abstract relations. Her classification indicated that creative products may result through the conscious use of most areas of the school curriculum, that is, she defined creativity in terms of school setting.

Rogers (1959) and Barron (1969) defined creative process in terms of its novelty. Novelty, however, does not mean making something out of nothing. To be creative, therefore, is to be able to bring something new into existence by the reshaping of something old. Moreover, these two authors stated that social value should be excluded from the judgement of a creative product because such a value is frequently subject to

modification and fluctuation.

In contrast to Rogers and Barron who insisted on the product aspect of a creative activity, Wallach and Kogan (1965) stressed the cognitive angle in a creative process. In their thoughts, creativity is "the ability to generate many cognitive associates and many that are unique" (p. 64). They also saw creativity as "a unitary and pervasive dimension of individual differences in its own right" (p. 65).

Wallas (1926) was the first author who elaborated on the four basic steps in the creative process. Later, these steps were reexamined and reformulated by Guilford (1957), Taylor (1959), and Marksberry (1963). They are (a) a period of preparation, (b) a period of incubation, (c) a period of inspiration, insight, or illumination, and (d) a period of verification, elaboration, perfecting and evaluation.

Torrance (1974b) defined creativity as:

a 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 deficiencies: testing and retesting these hypotheses and possibly modifying and retesting them; and finally communicating the results (p. 8).

Torrance contended that this definition described a natural human process. At each stage of the process, strong human needs are involved. People are uncomfortable when tension is aroused because of some disharmony or incompleteness, and they want to relieve the tension. Since inadequacy exists in conventional behaviors, people try to avoid the commonplace and incorrect solutions by investigating and making guesses. They are still uncomfortable until the hypotheses or guesses have been

tested, modified, and retested. People will not feel quite comfortable until they can tell somebody of their discovery. This definition has the advantage of describing the whole creative process, but it is somewhat complicated.

Through the above definitions of creativity, some specific components may be identified as follows: uniqueness or originality; the outcome of a creative work is something new; this newness takes its root in the past or old experiences; and the creative process is individualized but the result of the creativity is subjected to social tendencies, one of which is that of communicating what has been created to other persons.

Creativity in Regard to Some other Intellectual Capacities

In this section creativity is compared to other intellectual capacities such as intelligence, problem solving, and critical thinking.

Creativity and intelligence. The relationship between creativity and intelligence has been investigated by a number of researchers. Guilford (1967, p. 167) collected some of these investigations and put them together in a table which is reproduced in Table 1. After presenting his reflections with regard to the table, Guilford concluded that although high IQ is not a sufficient condition for high divergent production (DP) ability, it is almost a necessary condition.

Getzels and Jackson (1962, pp. 52-53) showed a contrast between the high-IQ and the creative student's performances in story-telling ability. For example, the students were shown a picture of a man sitting in an airplane as if he were returning home from some trip, and were asked to make up a story about the picture. Some examples of their answers were as follows:

The high-IQ subject. Mr. Smith is on his way home from a successful

Table 1

Some Representative Correlations between Traditional Intelligence-test
Scores and Assessments of Creative Potential and Performance

Investigator	Type of Subjects	Intelligence Test	Creative Assessment	Correlations
Torrance (1962)	Elementary grades	Stanford-Binet	DP-test composite*	.16, .17
		Otis		.32
		Kuhlman-Anderson		.26
		California TMM		.24
Yamamoto (1964)	High School	Lorge-Thorndike	DP-test composite	.30
Torrance (1962b)	Graduate students	Miller Analogies	DP-test composite	-.02, .11
Torrance (1962b)	Graduate students	Ohio State PE	DP-test composite	.10
D. W. Taylor (1960)	Engineers	Terman Concept Mastery	Ratings	.20, .07
MacKinnon (1961)	Architects	Terman Concept Mastery	Ratings	-.08
	Scientists		Ratings	-.07
Ripple and May (1962)	Seventh grade	Otis	DP-test scores	.11-.73
Razik (1963)	College	Ohio State PE	DP-test scores	-.04-.37
Guilford and Hoepfner (1966)	Ninth Grade	California TMM	45 CP-test scores	-.04-.70 (M=.32)
		C-Z Verbal Comprehension		-.15-.52 (M=.21)

* DP stands for divergent production.

business trip. He is very happy and he is thinking about his wonderful family and how glad he will be to see them again. He can picture it, about an hour from now his plane landing at the airport and Mrs. Smith and their children all there welcoming him home again.

The high creative subject. This man is flying back from Reno where he just won a divorce from his wife. He couldn't stand to live with her anymore, he told the judge, because she wore so much cold cream on her face at night that her head would skid across the pillow and hit him in the head. He is now contemplating a new skid-proof face cream.

Note that the high-IQ subject seems to be more cautious while the high-creative subject is freer in his interpretation and presents a more unusual story which deals with a more controversial and unfavorable theme: divorce, in addition to adding some ironic humor for good measure.

Gallagher (1975) reviewed Getzels and Jackson's findings and commented that the high-IQ student revealed a very close relationship between the values he wants for himself and those that teachers would like. In contrast, the high-creative student saw little relationship between his own values and the values that he thought society and his teacher prefer.

The study by Getzels and Jackson created a great deal of interest, and many similar studies soon followed. One of the more important was carried out by Wallach and Kogan (1965), who compared the performance of 151 fifth-graders, the entire school population of a suburban middle-class school on measures of creativity and intelligence. Their research revealed the following:

High creativity - high intelligence: these students can exercise within themselves both control and freedom, both adult-

like and childlike kinds of behavior. They are popular, confident, able to concentrate well on what they are doing, and show great insight.

High creativity - low intelligence: they are in angry conflict with themselves and their school environment. They have low opinions of themselves and are harassed by feelings of unworthiness and deficiency. They work best, however, when they see no stress put on them.

Low creativity - high intelligence: these children are oriented to school achievement, to conformity. School failures are perceived as catastrophic, so that they must always strive for good grades in order to avoid possible pain, physical as well as psychological.

Low creativity - low intelligence: Basically befuddled, these children engage in numerous defensive measures, ranging from useful adaptations such as intensive social activities to regression such as passivity or the development of psychosomatic symptoms.

In summary, as Getzels and Jackson (1962) suggested, there is only a slight overlap of intelligence and creativity: (a) the intelligence quotient and creativity are uncorrelated at higher levels of intelligence; (b) high-creativity students are less known and liked by their teachers than high-IQ students; (c) high-creativity students are socially non-conforming and more independent than high-IQ students; (d) highly creative students are also less success-oriented than high-IQ students.

Creativity, problem solving, and critical thinking. In 1910, Dewey

proposed a process in problem solving, including five stages: (a) a difficulty arises, (b) the difficulty is clearly stated and defined, (c) various solutions are suggested, (d) consequences are weighed, and (e) a solution is accepted. In somewhat the same vein of thought, Wallas (1926) proposed four steps in originating creative production. These were: (a) preparation, in which necessary information is gathered; (b) incubation which is characterized by unconscious works of the mind; (c) illumination, that is, some "inspired" solution flashes and gives a cue to the whole situation; and (d) verification, by which situations are examined and elaborated. Rossman (1931) proposed seven steps in creative production which included: (a) difficulty or need felt; (b) problem formulated; (c) information gathered; (d) possible solutions stated; (e) solutions scrutinized and selected; (f) new ideas shaped; (g) new ideas tested and approved. These concepts elaborated above by the three authors are summarized in Table 2.

Though many similarities exist in problem solving and in creativity, the main difference seems to be that creativity requires some originality while problem solving does not. In the problem solving, someone, the textbook, or the teacher, or the inventor knows the right answer for the problem. In creativity, on the contrary, a new and unique combination of existing elements will produce a product that is not wholly predictable by either teacher or student when the process begins (Gallagher, 1975).

To conclude, one can agree with Hilgard (1959) that problem-solving belongs to the cognitive approach, while creative thinking belongs to the personality approach. The first approach tends to emphasize learning in which a higher-order product emerges, although not necessarily a highly-

Table 2

Steps in Creative Production and in the Solution of a Problem as
Seen by Wallas, Rossman, and Dewey, Showing Differences and Similarities

Wallas	Rossman	Dewey
	Difficulty of need felt	Difficulty arises
	Problem formulated	Difficulty stated and defined
Preparation, by gathering information	Information gathered	
Incubation, by working unconsciously		
Illumination, by seeing possible solutions	Solutions stated	Solutions suggested
Verification, by examining and elaborating on solutions	Solutions scrutinized and selected	Consequences weighed
	New ideas shaped	
	New ideas tested and approved	Solution accepted

original one. The second approach tends to stress elements of uniqueness, novelty, and creative imagination.

As for the relationship between creative thinking and critical thinking, Russell (1956) stated that critical thinking involves reactions to others' ideas or to one's own ideas, whereas creative thinking involves producing new ideas. Creative thinking tends to achieve something which does not coincide with previously determined conditions.

To demonstrate slight differences between creative thinking and critical thinking, Smith (1966, pp. 54-57) used an illustration which may be summarized as follows: A junior high school class was about to make plans for the Junior Prom, but they had only \$25 to use for decorations. The art teacher promised to provide two rolls of wide, white mural paper and a large supply of purple construction paper. The faculty advisor held a brain-storming meeting and posed the problem: with these materials, what original ideas do you have that you could use to come up with a theme and some exciting decorations for our Junior Prom? Soon the ideas began to come; students proposed a variety of uses of materials available in decorating and in fantasizing a theme for the prom. Different themes called for different decorations: Dances Around the World required pictures of Australia, Spain or Vietnam; Japanese Cherry Blossoms required trees and blossoms; and It's Raining Violets required bouquets of violets and pictures of Spring.

In this illustration, imagination, originality, flexibility and fluency of thinking, relatedness of ideas, and uniqueness of planning are evidence of creative thinking. But once the ideas are listed, the evaluation of each idea involved critical thinking. In this phase, facts must be weighed, judgments passed, and decisions made.

In summary, though creative thinking shares many traits with problem-solving and with critical thinking, it has unique elements that differentiate it from either. One may conclude with Smith (1966) that "creativity is a type of problem-solving stretched along a continuum from very simple thinking and learning to very complex thought processes" (p. 57).

Creative Personality

Two approaches have been taken to the study of the creative personality. One is holistic or the study of the creative person's personality in its totality; the second approach is the study of the specific traits of the creative person's personality.

The holistic approach. Maslow is recognized as the most representative researcher advocating this approach (1959, 1970, 1972). According to Maslow, creative people are self-actualizing persons; those persons who live through "peak experiences." These experiences are invasive moments in which the person feels his whole life totally changed and he lives more profoundly "in the realm of Being; poetry, esthetics, symbols, transcendence, 'religion' of the mystical, personal, noninstitutional sort" (Maslow, 1970, p. 165); his life changes mostly in the realm of love (Maslow, 1970, pp. 181-202). Because of his/her originality, a person who wants to become creative through an easy route is similar to one who is "looking for some secret button to push, like switching a light on and off" (Maslow, 1972, p. 291).

Maslow thought that the creative person was one who had to be considered holistically rather than atomistically, functionally rather than taxonomically, dynamically rather than statically. There is no single prescription for the pursuit of creativeness, in the same way as there is no single way to eliminate prejudice. As an illustration,

Maslow described his colleague, Jones (1960) who conducted a group therapy course with high school students in an attempt to deal with racial discrimination and ethnic prejudice. Although Jones did not mention racial discrimination or prejudice during the entire academic year, the students showed mutual understanding and cooperation at the end of the class. In the same way, Maslow felt that creativity should be dealt with in a roundabout fashion; that is, a student does not become creative because he/she is told, "Be creative!". Rather, he/she needs a whole dynamic atmosphere in which creativity is functionally fostered.

In 1968 in Toward a Psychology of Being, Maslow summarized his thoughts regarding self-actualizing creativeness. He asserted that such creativeness "stressed first the personality rather than its achievements" (p. 145). It stressed characterological qualities like spontaneity, integration, self-acceptance, boldness, and courage. Maslow's position that there is no special "button" for creativity and that the creative person must be considered holistically and dynamically is an appealing one; however, it raises problems when one wants to apply it in real life because it does not offer any practical direction, particularly in educational pursuits.

The specific traits approach. The second approach, as mentioned earlier, is the study of the specific traits of creative personality. According to Hirsh (1931), the creative person stands out because of six special personality traits: he is (a) bashful, (b) oversensitive, (c) sincere, (d) melancholy, (e) fond of solitude, and (f) values friendship.

Torrance (1962) surveyed a large number of studies and compiled a list of characteristics that aimed at differentiating highly creative persons. His list included many traits, most of them positive, but a

few negative as well. Negative traits, for example, are lacking business ability, making mistakes, regressing occasionally, keeping unusual hours, bashful outwardly, oddities of habits, and a fault-finder; positive traits can be seen as courageous, never bored, persistent, resolute, sincere, introversive, willing to take risks, attempting difficult jobs, having deep conviction and strong affection, defying conventions of health, and feeling whole parade to be out of step. Some other traits are similar or related to intelligent capacities such as speculative, self-starter, thorough, naive or unsophisticated, unwilling to attempt anything on mere say so, not interested in small details, differentiating value-hierarchy, always baffled by something, and attracted to the mysterious. Socially, Torrance included in his list many traits which may be seen as related to others. Some of these are altruistic, discontented, constructive in criticism, not hostile or negativistic, receptive to ideas of others, defying conventions of courtesy, not fearing to be thought "different," shunning power, spirited in disagreement, desiring to excel, and primitive or uncultured.

Torrance (1962) believes that creativity required unconventional thinking and considered creativity antithetical to conformity. He differentiated between a talented conformist who may become a brilliant enhancer or manipulator of the ideas of others, and an equally talented non-conformist who may make imaginative breakthroughs to new knowledge. Sensitivity and independence were equally important to a creative person, while the former was seen in Western culture as a feminine virtue, the latter a masculine. Thus, Torrance believed that the creative boy

may appear more effeminate than his peers and the creative girl more masculine than other girls. He also found that the highly creative student is often psychologically estranged from others because he is accused of having wild and silly ideas. In addition to traits by Torrance, Smith (1966) added that the creative student is able to summon up a great deal of humor and playfulness. He tends to work in isolation and is often uncooperative, at times greedy and ego-centered.

Taylor (1961) found that creative people are more independent in judgement, stable, self-accepting, radical, emotionally sensitive but bold, introverted, autonomous, dominant and self-assertive, open to the irrational, interested in unconventional careers, unconformist, feminine in characteristics, complex as a person, and adventurous.

In general, Taylor's attributes substantiated and supported Torrance's earlier research. Additional research also supports their theories. MacKinnon (1962, 1967) concluded from his studies that highly creative persons have self-images quite different from those of less creative persons. He pointed out that highly creative architects described themselves as individualistic, determined, industrious, enthusiastic, and inventive. In contrast, relatively less creative architects often saw themselves as dependable, sincere, responsible, clear thinking, tolerant, and understanding. To say it in other terms, creative architects stress their individuality, industry, determination, enthusiasm, and inventiveness, while less creative architects emphasize their virtue, good character, and their rationality and concern for others.

The most striking trait of the creative person, however, according to MacKinnon (1967), is his courage. "Courage" defined by MacKinnon was similar to the same trait found in Maslow's (1964, 1968) self-actualizing

people: It is personal courage, the courage to be oneself in the fullest sense, to develop one's abilities, to grow as much as a person can to actualize all one's potentialities. The creative person cannot be seen as either a conformist or a nonconformist because he does not care what others say about him; he is genuinely independent. Because of this, he may be accused of being socially irresponsible.

In brief, a creative person may show a variety of positive personal traits such as altruism, courage, and adventurousness; he may also have a number of negative traits such as making mistakes, being a fault-finder, showing oddities of habits and rebellious-like behavior.

Summary from the Concept of Creativity

In summary, over the centuries, hundreds of scholars have investigated one of the highest human potentialities: creativity. The development and definition of creativity has been scrutinized. Researchers have been divergent in their definitions of creativity. Guilford can be identified as the earliest programmatic investigator of creativity with his concept of divergent and convergent thinking. Getzels and Jackson are noteworthy for their development of elaborate techniques in studying creativity. Torrance can be considered one of the leading researchers in the field because of his research regarding the creative potentialities of young people and regarding the influence in the scholastic system that hinders their creativity; he has made valuable suggestions about promoting whatever creative tendencies the young student happens to have.

Creativity is defined as a process, a complex one. Though scholars do not unanimously agree upon a definition of creativity, the majority include components such as Originality, Flexibility, Fluency, and Elaboration.

With regard to the relationship between creativity and intelligence, Getzels and Jackson suggested that there is only a slight overlap of these two intellectual factors. As for the matter of problem-solving and creative thinking, Hilgard stated that the former tends to emphasize learning in which a higher-order product emerges, while the latter stresses elements of uniqueness, novelty and creative imagination. The difference between critical thinking and creative thinking lies in the fact that the former involves reactions to one's own ideas or to ideas of others while the latter does not.

The creative personality appears to be positive as well as negative. Whether negative or positive, personal traits of creative people tend to be more original, more estranged from those of common people. This study will investigate the degree of creative thinking of male and female Vietnamese, Filipino, and Anglo-American college undergraduate students; it will investigate the traits of Fluency, Flexibility, Originality, and Elaboration, and determine any differences in these traits that may be attributed to their different cultures.

II. Culture and Creative Thinking

In this section, three themes will be studied: development and definitions of culture; culture and creative thinking; and creative thinking with regard to the Vietnamese, Filipino, and Anglo-American culture.

Development and Definitions of Culture

With the exception of human beings, what a member of a species learns is lost when it dies. If a female magpie, for example, learns how to say "Hi, friend!", it is not apparent that she will be able to

teach her offspring to repeat that same greeting. This phenomenon is not true of the human being. As Murdock (1965) stated, most of man's behavior acquired by any individual has previously been learned and found adaptive by other persons in his society and then he, in turn, transmits what he learns and discovers to the next generation. The interaction between society and its members produced what is far beyond the capacities of each member if counted separately. "The term 'culture' is applied to such systems of acquired and transmitted behavior" (Murdock, 1965, p. 6).

Since human beings are endowed with freedom while culture is the product of man himself, it may be appropriate to say that culture changes with the varying and cumulative experience of the individual in his social group. To term it differently, culture is in evolution. Like other kinds of progress, social progress is divergent. Each differentiated product results in a new set of products. Culture, in a way, provides the technology for appropriating nature's energy and putting it to service; it also provides the social and ideological means of implementing the process. Generally, a culture adjusts itself to other cultures of its environment. Thus perceived, culture undergoes adaptive, phylogenetic development (Gamst & Norbeck, 1976).

Murdock (1965) also viewed culture as the product of learning, including the factor of heredity. The differences, observable among different cultures, were the cumulative product of mass learning under diverse geographic and social conditions. Fear, hunger, security and other basic drives, as well as acquired motivations, pushed human beings to behave and work. With repeated success in action, responses in a particular way became habits and gradually adapted to appropriate situations. Persons of the same age group or sex, members of the same

social class, tribe or occupational group usually resembled one another in their social habits, though diverging behaviorally from persons in other categories.

Social habits, also in Murdock's view, fall into two major classes which may be termed customs and collective ideas. Customs were comprised of modes of behavior such as ceremonies, etiquette, and the techniques of manipulating material objects. Thus perceived, customs were observable. Collective ideas were inferred from their expression in language and included such things as practical knowledge, social values, and religious beliefs. They were not directly observable. Collective ideas also included a set of mutual expectations such as anticipations of how others would respond to one's own behavior; mostly they included a body of the sanctions, for example, social punishments and rewards that could be expected from deviation and conformity.

Though the person who followed the custom was not original in his thought or habit, the one who introduced the custom or the cultural changes was original because this cultural change began with the process of innovation, the formation of a new habit by a single individual; this habit was subsequently learned or accepted by other members of his society. Because innovation and invention take place in most cultural change processes, at least some degree of creativeness is always present in such a process (Murdock, 1965).

The Whittings (1975) studied children of six cultures which were located in Taira, Japan; Tarong, Philippines; Khalapur, India; Nyansong, Kenya; Juxtlahuaca, Mexico; and Orchard Town, USA. After long and elaborate research, they concluded that differences in learning environments produce differences in social behavior. The children of each culture were

indistinguishable in some respects but unique in others.

Regarding creativity in the process of cultural change, it is appropriate to review the opinions of Yacorzynski (1954). In his thought "the evidence for the belief that creativity - the desire for self-expression - is the all-prevalent urge for man's behavior is limitless in scope" (p. 181). According to Yacorzynski, the desire for self-expression is present in all human acts. The human being is capable of adjusting himself to any environment; in some environments the human may progress toward his full development. Though man must integrate himself to his environment, this integration is necessary only so that he will enjoy more freedom to express his creative urge. This urge is evident in the way children express themselves: it is this desire which motivates them to understand their environment and to develop language because words sound good to them.

Though people who introduced custom and culture may be considered original in their thoughts as previously noted, those who retain these customs and culture are usually considered culture-bound (Rogers, 1961). Once a person becomes enculturated, set in certain attitudes and behaviors, and in certain ways of life, how can he/she become unique or quite different from others? This is seemingly the reason why Maslow's (1970) self-actualizing people resisted enculturation; they always tended to transcend their particular culture.

In summary, the process of development of culture is a slow and cumulative one. Culture can be said to be original in its initial stages but soon it is regarded as becoming old-fashioned and routine. This leads to another question: What is culture?

Definition of Culture

As early as 1871, Tylor defined culture as being "that complex whole which includes knowledge, belief, art, morals, law, custom, and any other capabilities and habits acquired by man as a member of society" (cited in White, 1972, p. 38). Actually, during the past century, anthropologists have formulated hundreds of definitions of culture. Kroeber and Kluckhohn (1952) observed that most of these definitions are similar and that they may be reduced to a few categories. Gamst and Norbeck (1976) cited the two most outstanding categories which may be called idealistic and realistic.

In the idealistic category, culture is seen as an organization of norms of behavior that exist in the minds of people who live in a certain culture, and who transmit these norms to future generations. Thus conceptualized, cultures are couched in terms of configurations of behavioral rules or "laws" which are not observable. Because culture in this category is considered as unobservable or abstract, it is viewed also as unreal.

In the realistic category, culture is defined in terms of natural phenomena which are observable and amenable to scientific study. Conceived as such, culture is as "concrete" as magazines, mathematics, or even as a cow. According to this point of view, culture may be regarded as existing distinctly and independently from knowledge of all these observable phenomena.

From a functional viewpoint, culture is identified as man's way of maintaining life. To maintain life, man has created symbols (Cassirer, 1976). To say it differently, culture is seen as depending upon the unique ability of a human being to create symbols. Symbols keep the

human being in some conformity but they are also the sign of the creative mind of man himself.

Better to understand culture, Linton (1954) distinguished it from social systems though some people consider these two terms interchangeable. According to Linton, a society is an organized aggregate of individuals. A social system, according to long-established usage, is a collection of roles and status in terms of which all members of a society are organized together. Thus viewed, a social system is not identical to culture; rather, it is one component of a total culture, because a culture is the accumulation of learned behavior which included all organized ideas, habits, and conditioned emotional responses, including creativity. All these elements, in turn, are transmitted to and implemented by the future members of a particular society.

In summary, culture changes from society to society, therefore, creativity as one of man's unique abilities, should also manifest differently in each particular society and culture. Accordingly, creativity should also change from culture to culture. It is the purpose of this study to determine whether this assumption is true in terms of Vietnamese, Filipino, and Anglo-American college undergraduate students.

Culture and Creative Thinking

There is a paucity of research concerning culture and creative thinking. Because of the relationship between creativity and intelligence, opinions and research regarding culture and intelligence will be presented first, then the relationship between culture and creative

thinking will be reviewed.

Culture and intelligence. Rosenthal and Jacobsen (1968) studied self-fulfilling prophecies in the classroom. According to the theory of self-fulfilling prophecy, once the teacher knows the IQ score of a student, he/she will adjust his/her teaching to this IQ level. In so doing, the teacher fulfills the prophecy. Rosenthal and Jacobsen told some teachers in a California elementary school at the beginning of the school year that certain students in their classes had shown an outstanding potential for intellectual growth. Actually, these students were randomly selected. Yet these students, at the end of the school year, made remarkable gains on IQ tests and their scores were much higher than those of other students in the same class. Based on the results of this study, many educators came to believe that expectancies influence the way teachers, parents, and peers interact with children. Different cultures give different expectancies, therefore, culture may be seen as being among the factors which contribute to the development of intelligence in a person.

In 1958, Strodbeck presented a most provocative study of cultural values by comparing family and cultural values of 79 Jewish families and 43 Italian families in an eastern city in the United States. The Italian families did not increase the number of their members in the upper-middle and professional classes from one generation to another whereas the Jewish families doubled their incidence in these classes in just one generation. Certain values were highly stressed in Jewish families, such as:

- An individual can improve himself through education and one should not readily submit to fate.
- An individual should receive credit for completing assigned work rather

than the collective group.

- An individual should be willing to leave home to make one's future, to find one's own way in life.
- The father and the mother shared equal power in managing the family and in educating children.

As for Italian families, values and philosophies of life tended to be:

- An individual's being successful did not depend on one's own striving; rather chance and luck played the major role in most situations.
- The family rather than the individual should receive credit for achieving short-term and life-term goals.
- Children were family-centered; they were instructed to stay close to their parents as much as possible.
- There was a greater tendency to believe in the dominance of the father; the mother played a secondary role in all respects of family life.

To conclude, Strodbeck stated that cultures which foster great opportunity for developing individual intelligence and capacities can produce more achievers than cultures which insist on the importance of family-centered life.

Gallagher (1975) described a ten-year longitudinal study and concluded that, according to the result of the study, some children apparently increased their IQ scores as they grew older, while other children consistently seemed to decrease their IQ scores. Because of the differences, these two groups of children were carefully examined to find out what elements differentiated them. Though many factors were examined, motivation in everyday life was regarded as the most important one. Children in families or schools in which they were highly motivated

systematically gained increasingly higher IQ scores; that is, different social environments or different cultures provided different degrees of motivation which in turn encouraged children either to develop his/her intelligence or to simply maintain it at the same level.

Lesser, Fifer, and Clark (1965) studied the influence of culture upon the mental abilities of children. They administered four intelligence tests to 320 Chinese, Jewish, Puerto Rican, and Black children from New York City. The results of their study showed that (a) the Chinese children scored higher in reasoning, number, and space, but lower on the verbal part of the tests; (b) the Jewish children scored higher on the verbal part, lower on reasoning, number, and space; (c) the Puerto Rican children scored higher on reasoning, number and space, but lower on the verbal part; and (d) the Black children scored higher on the verbal, and lower in reasoning, number, and space. In short, this study seems to indicate that a person's culture does influence his mental abilities.

Frierson (1965) studied the same traits in four groups of children: two average samples, one of upper socio-economic status and the other of lower socio-economic status; and two gifted samples. Various tests of interest and personality were administered to these samples and information about their family life was also collected. Some of the study results suggested that the lower-status gifted children were more likely to aspire to higher-status occupations, to read the news sections of the newspaper, to play musical instruments and to be more interested in action, while the upper-status gifted spent more time and showed more interest in reading.

In summary, intelligence is different from culture. It is also different from creativity, as shown by Getzels and Jackson's (1962) study

and previously presented in this chapter. As with many other personality intellectual traits, however, intelligence is influenced to some degree by the cultural environment in which it is developed.

Culture and creative thinking. Though culture may foster creative thinking as previously noted, it may also hinder the process of such thinking (Rogers, 1961). To put this deduction in other words, creative thinking is not independent of the culture in which it is developed. It is known that intelligence is influenced by culture; similarly, creative thinking, to a certain degree, is a product of culture. Because of the close relationship between culture and creativity, if people want to be inventive, advanced, or original, to be abreast of the many changes in this world, they must make new and original adaptations to their environment. A generally "culture-bound people cannot cope with the multiplying issues and problem" (Rogers, 1961, p. 348) that are facing civilization today. To be creative, a person needs to be in a creative culture, a culture which does not urge people toward stereotyping, toward conformity. "Conformity" in this culture-bound sense is different from conformity in Kluckhohn's sense. This author wrote:

Today's kind of "conformity" may actually be a step toward more genuine individuality in the United States. "Conformity" is less of a personal and psychological problem, less tinged with anxiety and guilt.... If one accepts outwardly the conventions of one's group, one may have greater psychic energy to develop and fulfill one's private potentialities as a unique person. I have encountered no substantial evidence that this "conformity" is thoroughgoingly "inward" (cited in Lipset & Lowenthal, 1962, p. 71).

Conformity, as seen by Kluckhohn, may be considered as identical to social and linguistic conventions which help people better to solve their ordinary and daily problems so that they can concentrate their minds and energy on more important works. For example, conformities in language, in signs of traffic regulation, and in the way people greet each other may be regarded as fostering human activities and thinking. Conformity, however, as defined in the earlier chapter, may also be seen as hindering genuine individuality because it restricts a person's activities and thinking. Understood as such, conformity seems not to foster creative thinking and is rejected by American education. In Lipset's words:

Daniel Bell has argued that the growth in education [in the United States], among other factors, has reduced conformity. He comments that "one would be hard put to find today the "conformity" Main Street exacted of Carol Kennicott thirty years ago. With rising educational levels, more individuals are able to indulge in a wider variety of interest," such as serious music, good books, high level FM radio, and the like (Lipset, 1962, p. 171).

For Smith (1966), "Conformity is necessary to some degree in order for a society to exist, but excessive conformity and restricted approaches to learning are true enemies to creative development" (p. 35). At the Foundation for Human Research in Ann Arbor studies (Lungdington, 1958) researchers have found different kinds of conformity in people and that creative people tended to conform less than non-creative people even under social and cultural pressure.

In short, the way of life of a people influences the way of their thinking. In other words, there is a relationship between culture and

creative thinking and this relationship is usually regarded as depreciative. After strongly affirming that creativity is a universal characteristic of all the people studied or observed for their self-actualization, Maslow (1970) contended that self-actualizing people are endowed with resistance to enculturation. They may accept culture in numerous ways, but "in a certain profound and meaningful sense they resist enculturation and maintain a certain inner detachment from the culture in which they are immersed" (Maslow, 1970, p. 192). The relationship between self-actualizing, creative people and their much less healthy culture is depicted by Maslow as follows: these people are willing to accept apparent conventionality in the clothes they wear, the language they speak, the food they take; but they are not really conventional, certainly not smart or fashionable. They tend to accept most states of affairs they do not consider of primary concern to them as individuals. Hardly any of Maslow's self-actualizing subjects can be called authority rebels in the conventional sense. Though they often show bursts of indignation with injustice, they do not frequently show active impatience or chronic discontent with the culture.

An inner feeling of detachment from the culture is displayed by almost all subjects studied by Maslow, particularly when they were in discussions of the American culture as a whole, in various comparisons with other cultures. They very frequently seemed to be able to stand off from their own culture as if they did not belong to it. This detachment was proven in the fact that they could select from American culture what is good by their choices and reject what they thought to be bad. In brief, "they weigh it, assay it, taste it, and then make their own decision" (Maslow, 1970, p. 173).

To conclude, Maslow, in an attempt to answer the question of whether it is possible to be a good or healthy man, hence a creative man, in an imperfect culture based his arguments on his own observations. He stated that it is possible for healthy people to develop in American culture as long as this culture remains tolerant of their inner autonomy and their outer acceptance, that is, of detached withholding from complete cultural identification.

Torrance and Sato (1979) studied the nature of creative thinking of the Japanese on the occasion of the "recent emergence of Japan as 'Number One' in many areas of creative achievements" (p. 216). The two authors stated that the Japanese lead all other countries in the number of inventions and patents each year and emphasized the breakthrough nature of many of their scientific contributions, and their business and industrial innovations. The subjects of Torrance and Sato's study were 200 education majors enrolled in departments of education in eight universities in Japan and 200 education majors enrolled at the University of Georgia and the State University College at Potsdam (New York). The instrument used in this study was the figural portion of the Torrance Tests of Creative Thinking. Based on this study, the two authors concluded that the United States sample excelled the Japanese sample only on the creative ability factor of Fluency. The Japanese students scores significantly higher than their United States counterparts on all of the other variables such as Flexibility in processing, Flexibility in content, Originality, and Elaboration. Torrance and Sato called the Japanese "elaborators" (p. 220). It should be noted that Japanese traditional culture stresses the importance of free time and space which are

perceived as the valid interval or meaningful pause (Lee, 1964). According to Lee, "Such perception is basic to all experience, and specifically to what constitutes creativity and freedom in the framework of Japanese culture" (p. 56).

It should also be noted that the Japanese have adopted a democratic system subsequent to World War II. "The fact that the Japanese people have eagerly and readily welcomed Western civilization since the Meiji period is an indication of the value they place on the free play of initiative" (Doi, 1969, p. 339). Thus, differences between the way the Japanese and the American students responded to the tests of creativity might result from differences between the two cultures and from the fact that the Japanese have "eagerly welcomed Western civilization since the Meiji period."

In summary, culture plays an important role in the process of development of intelligence and creative thinking. To be creative, a person should be in a creative culture, that is, a culture which fosters the development of psychic energy to fulfill one's potentialities as a unique person. This study proposes to determine if Vietnamese, Filipino, and Anglo-American cultures differently fostered creative thinking in undergraduate students currently enrolled in colleges and universities in the United States.

Creative Thinking with regard to Vietnamese, Filipino, and Anglo-American Cultures

Creative thinking with regard to Vietnamese cultures. Creative thinking as part of Vietnamese culture has not been studied much and is not well understood. Geographically, the climate in Vietnam determines vegetation and animal life, the seasonal changes of economic activity, the state of people's health, the clothes they wear, the food they eat.

Uppermost among these factors is the fact that, because of its geographical location, Vietnam has been exposed to the Chinese culture. Another important geographical component of Vietnam is her 1,400 mile coastline. This adds considerably to the food supply of the country and makes many Vietnamese expert sailors. However, it is also a hazardous route by which much of the country is exposed to devastating typhoons off the South China Sea, and pirates and sea-faring traders who were frequently the advance guard of conquerors. During the eighth century, for example, the Javanese attempted to invade Vietnam three times by naval attacks and caused her severe damage. In the fourteenth century, the Mongols used the east coast in an effort to dominate the whole Indochinese peninsula; and in the nineteenth century, the French began their exploitation of the Indochinese peninsula by way of naval attacks along the coast of Vietnam. As a matter of fact, geographical aspects of a country profoundly affect its people's way of life. This very way of life creates its own customs and culture. Culture, in its turn, performs considerable influence on creative thinking.

The Vietnamese are suspicious of others, especially foreigners, and tend to feel comfortable only in their large family circle; nevertheless, the Vietnamese are sociable and are uncomfortable with physical loneliness. A traditional rural society was usually restricted to the village surrounded by a thick living bamboo hedgerow. Regional differences were great due to lack of communication between self-sufficient and isolated villages (Kirk, 1971).

Vietnamese civilization has been regarded as having its roots in the North of Vietnam. The Northerner is reputed to be overly ambitious and aggressive in all his pursuits. He is proud of his intellectual

superiority and is contemptuous of those from other regions, especially the Southerners who are viewed as excessively easygoing. Confucian tradition and the cultural heritage are best maintained in central Vietnam. It was in this part of the country that the imperial court held sway, and there the emperors' tombs are still revered. Men in central Vietnam make poor businessmen but respect intellectual pursuits. Life is austere and Western ways are slow to take hold. However, men from the central area are proud of their land, and even a peasant woman wears her Sunday ao dai to sell half-hatched duck eggs at the market. The Southerner lives in a land which has been continuously and successfully conquered by Vietnamese pioneers in a "march South" that is still going on even today. Because of the strong French economic and cultural influence in this region, the Southerner is recognized as being more open to Western ideas, less rigid and inhibited by traditional ways of doing things (Kirk, 1971).

Putting aside these differences, for thousands of years, the Vietnamese have been greatly influenced by Confucianism which stresses close relationships with one another. A male is instructed to keep the Three Relations of a Man's Duty (King and Subject; Father and Son; Husband and Wife) and the Five Common Rules (Benevolence, Righteousness, Civility, Knowledge, and Loyalty). A female has her own patterns of attitudes and behaviors which are the Three Follows (to follow the advice of one's parents while a maiden; that of one's husband while a wife, and that of one's children when a widow), and the Four Virtues (Proper Employment, Proper Demeanor, Proper Speech, and Proper Behavior). These teachings, though still remaining as ideal, have suffered many changes and young people do not consider them as seriously as their parents did

(Duong, 1975).

The customs and the lives of the Vietnamese have been tremendously changed under the impact of a long war and the subsequent socio-economic upheavals. Traditionally, soldiers and merchants were low on the social scale; the peasants ranked higher, the mandarins and scholars were the most respected class. French colonial policy, however, has overturned many of these ancient values and beliefs. Enormous power is entrusted to military mandarins. A new and growing class of Vietnamese petty bourgeois appeared under the French rule. The whole culture and value systems were disrupted (Buttinger, 1972; Huynh, 1979).

With regard to the Vietnamese educational system, it might be seen as fostering rote learning. Duong (1975), in an attempt of helping American teachers better understand their newly arrived students, wrote:

Since Vietnamese students are accustomed to having their teachers deciding everything for them, including telling them what they should do in class, they may naturally expect their American teachers to do likewise. To be on one's own, to be allowed to take certain initiative in one's studies, however exciting this may be, may also be confusing and even threatening to someone who has not been trained to enjoy such freedom. To assist the Vietnamese students to make a smooth transition from their own school system to a completely new one, it is advisable that their new teachers initially assume an authoritative role to guide the students and to acquaint them with the new classroom procedures until they feel more at home with their new environment (p. 4).

In the field of literature and history researches, though many Vietnamese are proud of their four thousand years of civilization, the first Vietnamese authors who used the scientific method in investigating Vietnamese literature and history appeared only in the 1930's. Dương-Quang-Hàm (1979), the most famous Vietnamese literature researcher said in 1941 that:

Ai cũng biết rằng hiện nay [1941] không có quyển sách nào chép về văn-học, lịch-sử nước ta [một cách khoa học], không nói gì những sách tham khảo tinh tường cho các học giả dùng, ngay đến những sách tóm tắt các đại cương cho học sinh dùng cũng không có (p. iii).

Everybody knows that presently [1941] there are not any books recording [scientifically] Vietnamese literature and history; no profound reference books for scholars, even no summaries and outlines for students in their daily learning (translated by the investigator).

In the 1930's, Trần-Trọng-Kim, the first Vietnamese historian who used scientific methods in his investigation, wrote:

Sử của mình đã không hay, mà người của mình lại không mấy người biết sử.... Bất kỳ lớn nhỏ, hễ ai cấp quyển sách đi học thì chỉ học sử Tàu, chứ không học sử nước nhà. Rồi thơ phú văn chương gì cũng lấy điển tích ở sử Tàu, chứ chuyện nước mình thì nhất thiết không nói đến (1978, p. viii).

[Vietnamese] history is not bright and very few Vietnamese know their history.... Whether young or adult, anyone who goes to school learns only Chinese, not Vietnamese, history.

Moreover, poems and prose are inspired by Chinese allusions and history while Vietnamese literary and historic events are totally ignored (translated by the investigator).

In summary, above is a sketch of factors which have contributed to and influenced Vietnamese culture. Geography, history, climate, and education have played an important role in establishing that culture which tends to foster loyalty, family cooperation, social conformity, and rote learning rather than adventurous performances, individual competition and diversity in thinking. As presented earlier, there is a relationship between culture and creative thinking; if Vietnamese culture is different from American culture, it is probable that differences will also be found in creative thinking between the students of these two cultures.

Creative thinking with regard to Filipino culture. On a map, the Philippines appear as part of an island chain extending southward from the eastern part of Asia and forming a guardian line protecting Asia's eastern shore. The whole country consists of more than 7,000 islands with a total area of 114,400 square miles. The famous Portuguese navigator, Ferdinand Magellan, had discovered that land in 1521 and brought it under the Spanish government's supervision.

Prior to the European discovery, the Negrito culture was widely diffused in this archipelago. The Negritos, however, were driven into the wilder portions of the Islands by Malay invaders, and less than twenty-five thousand presently exist in the Archipelago (Catapusan, 1940). In the ninth century, the Indonesians penetrated Sulu; in about 1375 the Javanese came to the Islands. During the early part of the fourteenth century, the Moros occupied most parts of the south. The next invaders were the Chinese. The Chinese traders and merchants,

however, came to the Philippines beginning with the tenth century and continuing on for centuries. The white men's invasion composed the fifth and sixth invasions, being made chiefly by the Spaniards and the Americans, respectively. According to Catapusan, the Spanish had tremendous influence "in civilizing the primitive Filipinos, and also in shaping the destiny of the Filipino nation" (p. 7). As for the Americans, Catapusan considered them, for almost three decades, as the greatest guides, supervisors, and directors in numerous Philippine national affairs.

The population of the Islands is subdivided into at least 47 ethnographic groups, speaking 87 different dialects. Four of them, however, are principal dialects which are Visayan, Ilocano, Bikolano, and Tagalog. The Tagalog is mostly found in Manila and in the provinces surrounding it. Because of the lack of transportation and communication in their early history, the people in the Islands not only spoke many dialects, but they also segregated themselves from each other and sometimes were widely isolated. Living in such a dissociated manner, people tended to develop localized feelings.

The majority of the inhabitants of the Archipelago are of Malayan extraction, though they have been modified through infiltrations with other people such as Negritos, Indonesians, Chinese, and to a limited extent, Spaniards and other Europeans. A Filipino today may be considered as an intermediate hybrid of the Mongoloid, Negroid, and Caucasoid race (Catapusan, 1940). He is fundamentally Malay in race, Animistic in religion, family centered in sociology, paternalistically despotic in political tendency, and hunting, or agricultural in economics (Bulatao, 1969).

In matters of customs, the Filipinos are regarded as simple, docile, peaceful, patient, industrious, law-abiding, and obedient to authorities (Catapusan, 1950; Caudill & Tsung-Yi, 1969). Catapusan repeatedly emphasized the simplicity of the Filipinos. Social life in the Islands is personal, warm, and intimate. Ethnocentrism of the Filipino increases their loyalty to the group and binds them together solidly. The Filipino's self-esteem is extremely important to him, and for him there is a constant risking of it in situations that would be regarded as trivial or impersonal in other societies (Sechrest, 1969). Sechrest concluded that interpersonal relations in the Islands "are characterized by a superficial aura of good will and an underlying strain and lack of openness" (p. 313).

Bulatao (1965) observed that it is very important to a Filipino to keep his personal modesty and a proper sense of hiva. This term denotes a sense of valuing an individual's recognition of his proper position with respect to others and of his capacity to experience shame when he disregards that position. He should not be boastful, and not attempt to rise above his peers in any way. Lynch (1965) noted that if a Filipino rises discriminately above others, he will find himself the object of serious attempts to cut him back to his proper position and level.

Suppression of individuality is evident in the Filipino culture (Bulatao, 1963; Hollnsteiner, 1963; Guthrie, 1966). Most parents have the right to control all aspects of their children's behavior. Young people are usually expected to think and to behave as everyone else his age does. Deviations in thought and action are severely condemned. Guthrie (1941) studied interpersonal attitudes of American and Filipino college women, and found that Filipino women agreed less frequently to items like "I

like to have people watch me do the things which I do well"; and "I argue with zest for my point of view against others." They, on the contrary, relatively more often endorsed such items as "I feel lonely and homesick when I am in a strange place"; "I often seek the advice of older persons and follow it"; and "I prefer to accept suggestions rather than insist on working things out my own way" (Guthrie, 1961, p. 167).

As for the need of belongingness, Sechrest (1969) found that the Filipino sees his identity in his family connections rather than in his own right as an individual. Bulatao (1964) also observed that the hiya system makes a Filipino sometimes excessively eager to please authority figures, mostly family figures. Hiya is seen by Bulatao as a painful emotion a person experiences when he has to deal with an authority figure or with society inhibiting self-assertion in a situation he perceives as dangerous to his own ego.

Regarding the educational system in the Philippines, Bulatao (1969) observed that the system was based mainly on rote learning. Filipino students tended to give back by rote, without analysis, what had been taught. To illustrate his viewpoint, Bulatao stated that the Filipino high school students usually do much more poorly than the American in reasoning while better in spelling.

In summary, some inconsistencies exist in the Filipino culture because of the many differences attributable to their historical and geographical background. This culture motivates loyalty to one's own group, family-bound relationship, suppression of individuality, and rote learning. The Filipino culture, viewed as such, shares many cultural traits with the Vietnamese culture and differs from the American culture.

Because of this difference, it may be expected that the Filipino College undergraduate students should also differ from the Anglo-American college undergraduate students in their creative thinking process.

Creative thinking with regard to Anglo-American culture. Wagner (1975) asserted that American culture is "its science, art, and technology, the sum of achievement, inventions, and discoveries that define our idea of 'civilization' the productiveness or creativity of our culture is defined by the application, manipulation, reenactment, or extension of these techniques and discoveries" (p. 22). This culture and its trends were viewed by Rogera (1961) in terms of a dearth of creativity. He stated that American schools educate students to be conformists or stereotypes; they are taught how to "complete" their education rather than how to become freely creative and original in their thinking. In the same vein of thought, Jacob (1956) stated that the college experience is "to socialize the individual, to refine, to polish, or 'shape-up' his values so that he can fit comfortably into the ranks of American college alumni" (Jacob, 1956, p. 6). According to Baltzell (1962), middle-class values in the United States have permeated the whole social structure. "We are now witnessing, as never before, the democratization of plutocracy on America" (p. 271). Thus, he saw democracy as being antithetical to divergent thinking or creativity. In agreement with Baltzell, Riesman (1967) studied changes in American society and concluded that American people have learned to look like those others with whom they have been brought up, with whom they have learned "cooperation, tolerance, and restraint of temper" (p. 328).

Other investigations seemed to be in disagreement with what was stated by the above authors. Astin (1968), in extensive research done

when he was the director of the Office of Research of the American Council on Education, came to the following conclusion, "Although we have not documented all of the relevant environmental differences, those that we have been able to identify emphasize the great quantitative and qualitative diversity of environmental stimuli that can confront the entering college student" (p. 142; emphasis added). To say it in other terms, what was found by Astin in college student life was not conformist or stereotype. The American college alumni were not assigned "to socialize" the individual; rather, students in this country are challenged by "the great quantitative and qualitative diversity of environmental stimuli."

In 1973, Bouchard conducted a study on the impact of the introductory year program at the College of the Pacific on students' intellectual orientation. After a whole year of investigation, he concluded that "freshmen reported at the end of their school year that they found more than they expected in diversity, warmth, and friendliness of students. They also found more tolerance for divergent views and access to cultural offerings than they expected" (p. 151).

If Bouchard studied students' intellectual orientation in one university, Parsons (1977) analyzed the central problem of modern societies. After making a number of comparisons with students in the past and in other countries, Parsons stated that in the United States the proportion of youth receiving higher education has been edging upward. "The creative-innovative aspect of the educational system has increased its momentum" (p. 61). The work of the American school is thus not regarded as the imposition of a single value system but a clarification of alternatives.

The Preamble of the Constitution of the United States (1787) says "We the people of the United States, in order to form a more perfect union, ... and secure the blessings of liberty to ourselves and our posterity, do ordain and establish this Constitution for the United States of America". Thus, liberty or freedom--hence diversity in thoughts and actions--has been emphasized in this country for more than 200 years.

Taking root in democracy, that is, in liberty and freedom. American culture insisted on a creative-innovative aspect of education, mobility, and change at a time when the Vietnamese and the Filipino cultures stressed family relationships. As described earlier in this chapter, the American culture welcomes the thoughts presented by people such as Galton (1969) and Lombroso (1891). This culture has motivated researchers who devoted their time and energy to the study of intelligence and creativity such as Terman (1925), Cox and her colleagues (1926), and Torrance (1974b). As early as 1941, moreover, Mearns had already presented thoughts regarding "Discovering the Child as Artist," and "Learning, Discipline and the Free Spirit." Mearns insisted not only on individual creativity, but also on the way the parent contributes his/her part in fostering a creative environment in the home. Later, Guilford (1956) was credited with the earliest programmatic investigation of creativity. Divergent thinking and convergent thinking are two major components of the intellect in Guilford's model, and these concepts have played an important part in promoting creative thinking in this country. With Getzels and Jackson (1962), Torrance (1965), and a variety of other authors, American society and culture may be seen as leading in the area of nourishing creative process. This study will attempt to determine the differential effects of these three cultures on college age students as measured by creativity tests developed in the United States

To summarize, the Vietnamese culture may be seen as sharing many cultural characteristics with the Filipino culture. These two cultures,

however, both differ from the American culture. If creative thinking is influenced by cultures in which people live, differences may be expected to exist in the way the Anglo-American, Filipino, and Vietnamese college undergraduate students respond to the Torrance Tests of Creative Thinking. The next section of this chapter will review literature regarding creative thinking in different sexes.

III. Sex and Creative Thinking

Two topics will be reviewed in this section, first, the notion of sex differences and, second, the relationship between sex and creative thinking.

The Notion of Sex Differences

Sex differences have been investigated by many authors, including biologists, social scientists, psychologists, and humanists. Such differences are evident in the composition of the evolution of specific sex-determining chromosomes. Shaw (cited in Yussen & Santrock, 1978) diagrammed the differences and pointed out that every person inherits 23 chromosome pairs. Twenty-two of these pairs are nonsexual chromosomes; the twenty-third pair determines the person's sex. This last pair, the so-called sex chromosome consists of an X and a Y chromosome. The female has two large X chromosomes, that is, genetic constitution XX. The male has only one X chromosome and one male-determining Y chromosome which is much smaller than the X, that is, the male has genetic constitution XY. When searching medical literature, particularly the John Hopkins Hospital case records covering the period from 1930 to 1963, Washburn, Medearis, and Childs (1965) found sex differences in susceptibility to infections. One might expect greater resistance to infectious diseases in females while males are more susceptible. Biological sex differences

lead to functional sex differences and may result in sex differences in behavior.

Recently, Money and the Hampsons (Money, 1961; Hampson, & Hampson, 1961; Hampson, 1955) made extensive studies regarding gender role. On the basis of clinical observations and psychological evaluations of pseudohermaphroditic patients, these authors hypothesized that the gender role is entirely the result of a learning process which is independent of gonadal, chromosomal, or hormonal sex. To say it differently, gender role is created by environmental conditions during early childhood. Their methods of study consisted of spontaneous topics of discussion, reports on erotic practices, replies to direct and indirect inquiry, play preferences and recreational interests, demeanor and deportment, interviews, and projective tests (Hampson, 1955; Money & Hampson, 1955). Comprehensive clinical impression was used as the basis for determining whether responses were either feminine or masculine. Most of the patients in these studies conformed to their assigned sex role, that is, a person with male hormones who had been raised as a girl would frequently engage in activities that were common to girls, want to dress like a girl, and marry a man. In another study, Hampson and Hampson (1961) found that some children who were reared in a sex contradicting their predominant external genital appearance established a gender role entirely in agreement with assigned sex. In short, based on their studies, Money and the Hampsons believed that the human being is neutral at birth, psycho-sexually speaking.

Such a concept has been criticized. Diamond (1965) investigated experimental as well as clinical cases dealing with anatomic, genetic, endocrine, and behavioral factors and concluded that humans are predis-

posed at birth to a female or male gender orientation. According to Diamond, sexual behavior and the gender of an individual are not neutral at birth. He, however, added immediately that sexual predisposition is only a potentiality setting limits to a pattern upon which ontogenetic experiences exercise great impacts. Environment, society and culture formulate and establish some gender role to which an individual tends to adjust and conform his/her flexible sexual disposition.

In agreement with Diamond, Beach (1965) contended that sex differences are conceivable at least in the functional characteristics of the female and male brain. Such differences are evident at birth and exert influence upon the acquisition of social behavior tendencies, including the gender role.

One of Freud's (1949) basic assumptions was that human behavior is related to sexual or reproductive processes. Though female and male may equally develop themselves through the five stages, namely the oral stage (from birth to one year of age), anal stage (from two to three), phallic stage (from four to six), latency stage (from seven to twelve), and genital stage (from thirteen to nineteen), their sex differences are clearly distinguishable beginning with stage three, the phallic stage. It is during this period, Freud (1962) thought, that girls and boys become strongly aware of their sexual differences. Even their psychological complexes are different: Oedipus complex in boys and Electra complex in girls.

In line with Freud's thoughts, Erikson (1968) divided human development in eight stages. Each stage involved conflicts that the person may resolve with one of two emotional outcomes which are either positive

and healthy or pessimistic and unhealthy. These stages with their conflicts may be summarized as follows: oral sensory stage: basic trust vs. mistrust; muscular-anal stage: autonomy vs shame, doubt; locomotor-genital stage: initiative vs. guilt; latency stage: industry vs. inferiority; puberty and adolescent stage: identity vs. role confusion; young adulthood stage: intimacy vs. isolation; adulthood stage: generativity vs. stagnation; and finally, maturity stage: ego identity vs. despair. In analysing these developmental stages, Erikson claimed that sexually psychological differences take root from anatomical differences between females and males. In most of cases, females show themselves more passive and inclusive while males more aggressive and intrusive. To support his arguments, Erikson observed children in play and noticed that girls tended to construct low buildings with fences around them while boys built tall edifices without fences (Erikson, cited in Maccoby, 1966; Yussen & Santrock, 1978).

It has been said that sex differences can be real and unreal as well. The problem raised is that of how to detach the real from the unreal, or fact from myth. Maccoby (1966), and Maccoby and Jacklin (1974) examined thousands of research articles, which compared the performance of females and males to determine whether differences do exist. Their findings can be grouped in three categories and summarized as follows:

Unreal or mythical differences between sexes:

Girls are more suggestible than boys are.

Girls are more auditory, boys more visual.

Girls are more influenced by heredity, boys by environment.

Girls are more social than boys are.

verbal and fantasy aggression.

The United Church of Christ, in a book published in 1977, distinguished the traditional from the new theory of sex roles and stated that, according to Bem's study, there was considerable evidence that traditional sex typing is unhealthy. For example, the traditional theory said that if persons are high on masculinity, then they must be low on femininity and on anxiety; Bem (1975) found that high masculinity, may also correlate with high anxiety in adult life and low-acceptance. Based on the findings of Money, Bem, Maccoby and Jacklin research, Pleck (1976) concluded that the new and the old psychology of sex roles agree that men and women differ on certain psychology traits; the new psychology, however, found these differences smaller, less biologically based, and less socially different from the old understanding.

In summary, though sex differences are frequently biased, many of these differences can be seen as real, including biological, physical, psychological, and intellectual differences. How these differences affect creative thinking in male and female Vietnamese, Filipino, and Anglo-American college undergraduate students is one purpose of this study.

Sex and Creative Thinking

If creativity is defined as the individual's ability to "break set" or restructure a given problem, especially a perceptual one, there is a tendency for males, including boys and men to be superior (Maccoby, 1966). "Breaking set" is understood as tasks used to measure analytic ability. This term is employed to refer to the ability to respond to a stimulus situation without being drastically influenced by the background

or the field in which it is presented. Thus conceived, this analytic ability is identical to Witkin's "field independence." The results of tests such as the Rod and Frame Test and the Embedded Figures Test show girls score substantially and consistently lower than boys (Witkin, Dyk, Fateron, Goodenough, & Karp, 1962).

If creativity is understood as divergent thinking, as apart from convergent thinking (Guilford, 1956), the findings appear also to favor boys. When asked to think of ways for improving toys to make them more interesting, by the third grade, boys are superior to girls. On the contrary, according to Treambly (1964), and Klausmeier and Wiersma (1964), girls and women receive better scores on a battery of divergent tasks which are used to measure the variety of ideas produced to solve problems presented orally to all test-takers.

With regard to achievement, Maccoby (1966) pointed out that girls receive better grades than boys throughout the school years. But after graduation from school, women achieve substantially less than men in most aspects of intellectual activity such as scientific achievement, number of articles and books published, and artistic productivity. A follow-up study of gifted children demonstrated that while gifted girls did not tend to realize their potential in their creative output and occupations, gifted boys notoriously did. It should be noted that these differences between males and females might be due to the patriarchal culture and the sexism of American culture --as well as of Vietnamese and Filipino cultures-- in general. With women's liberation, things are changing rapidly (Gallagher, 1975).

Helson (1976) studied creativity in 44 women mathematicians who had obtained the Ph.D. in mathematics between 1950 and 1960. Her elaborate research allowed her to conclude that the traits most characteristic of

creative women would seem to be these: (a) flexibility both in mathematical work and in general attitudes; (b) rebellious independence, narcissism, introversion, and a rejection of outside influence; (c) strong symbolic interests and a marked ability to find self-expression and self-gratification in directed research activity.

Though many of these traits might be ascribed to a creative person, regardless of sex, they appeared more clearly in creative women mathematicians than they did in creative men mathematicians (Helson & Crutchfield, 1970). In creative men mathematicians, conventional attitude and behavior were essential while in creative women mathematicians the most obvious traits were their flexibility and their marked ability to find self-expression. These women also attained to a considerable degree, a simplification and integration of life.

Commenting on Helson's findings, Rothenberg and Hausman (1976) contended that many traits are common to both creative women and creative men. There are, however, some differences; while creative men were considered as having high scores on measures of feminine interest and orientation, Helson's creative women subjects were not characterized by high scores on measures of masculine interest and orientation.

In summary, it is difficult to determine the degree of difference in creativity between males and females. According to some researchers cited, however, girls have been found to be inferior to boys in some creative aspects but also superior in some others. They are lower than boys in "field independence," in their ability to break set or restructure a given problem, in improving toys, in a variety of intellectual activities in adulthood, in realizing their creative output and in their occupations. On the contrary, girls are superior to boys in

performing divergent tasks, and in getting better grades throughout the school years. Creative women mathematicians showed more simplification and integration in life than creative men mathematicians did. This study proposes to find out if any differences in creative thinking exist in male and female Vietnamese, Filipino, and Anglo-American college undergraduate students.

IV. Measurement of Creativity

The measurement of creativity or creative thinking abilities is still in a very primitive stage of development. Moreover, creativity is a nebulous concept which leads to difficulty in determining whether or not a person is creative.

Most of the standardized creativity tests have incorporated the notions of creativity outlined by Guilford, that is, they assess student divergent thinking products (Callahan, 1978). These products include the completion of tasks such as Alternate Uses, Plot Titles, Consequences, and the Utility Tests developed by Christensen, Guilford, and Wilson (1958). As previously noted, because of its primitive stage of development, the measure of creativity may have many critical points. For example, when Vernon (1978) reviewed the Schaefer's Creativity Attitude Survey (CAS), he stated that though this survey may be useful for evaluating the effectiveness of school programs devised to enhance creativity in groups of children, the survey has weak repeat reliability and no research has been reported on the effects of the tester, school climate, or children's interpretation of what the tester wants on scores. Yamamoto (1978), after carefully reviewing the reliability and the validity of the survey, concluded that "the CAS remains highly preliminary in nature and requires much more refinement, both conceptually and

empirically" (p. 363). Another example is the critique of French (1978). After reviewing the Creativity Tests for Children, developed by Guilford, Gardner, Merrifield, Hershon, Wilson, and Christenson, this author concluded that creativity is not easy to validate intelligibly because there exists no clear definition of what is meant by creativity. According to French, creativity varies not only with regard to contents, figural, verbal, or semantic, for which creativity is in question, but also varies with respect to the operations, evaluation, cognition, or divergent production and the products, classes, units, or relations.

In line with French's thought, Torrance (1974b) saw difficulty in constructing adequate validity for his tests of creativity. He considered this difficulty as natural and understandable because, according to him, creativity is a process and a person can behave creatively in many different ways. With this "process" approach, a person can think in terms of abilities needed for the successful operation of the process in different situations, or for the production of various kinds of products, or of the qualities of the products resulting from the process. Torrance's concept of the validity of tests of creativity will be fully depicted in the next chapter.

Taylor (1958) found that school grades, in general, have been shown to have low validity in predicting creative performance. Based on his research, he concluded that there is a low or negative correlation of academic grades with on-the-job performance, at least on research work. Taylor (1958) reported that at the 1957 University of Utah Research Conference on the Identification of Creative Scientific Talent, the Word Association Test, scored for remote association, yielded conflicting

results, including zero validities and instances where a common-association score predicted better than did a more-remote-association score. In general, Taylor (1962) was not successful in his attempt at finding a clear validity for tests of creativity. Because of its nebulous nature, creativity is not easy to be measured and its measurement is open to much criticism. To illustrate, some measurements of creativity are summarized in the following pages:

The Torrance Tests of Creative Thinking (TTCT). According to Baird (1972), these tests are designed to measure four aspects of creative thinking which are Fluency, Flexibility, Originality, and Elaboration. Two scores for each aspect are provided, verbal and figural. Test-retest reliabilities range from .30 to .93 over one to two-week periods, and from .35 to .73 over three-year periods (Buros, 1972). More than 50 studies suggested that the tests measure behaviors consistent with the literature on creative behavior (Torrance, 1974b). This test has been used most frequently in studies of creativity, and has been chosen for use in this study because of its reliability and validity, and also because of its easiness in administration. The characteristics of the test itself will be more fully described in the following chapter.

Guilford's Divergent Production Tests, including Utility Test, Consequences, and Expressional Fluency. According to Richards (1976), these tests were developed to measure abilities central to the creative process, that is, Fluency, Flexibility, Originality, and Elaboration. The tests "have been administered to a variety of samples" (Richards, 1976, p. 153). These tests relate to Guilford's multifactorial Structure-of-Intellect Model. Twenty-four distinct divergent production abilities are hypothesized; fifteen of these have been identified in at

least two samples and have been shown to be independent of other structure-of-intellect abilities and of each other. Richards stated that the Guilford tests are not too reliable if compared with the Wallach-Kogan creativity tests and more data needs to be provided regarding the validity of these tests. According to Taylor and Holland (1962), however, Guilford's most relevant study was a factor analysis of a large battery of creativity tests (Guilford, Wilson, & Christensen, 1952). Such an analysis formed a necessary basis for his statement that some components of cognition, memory, evaluation, convergent production, and especially divergent production are involved in creativity work. To what extent these components are validated in creativity tests has not been shown.

Burgart Symbol Test of Originality. Burgart (1976) developed this visual-written test to measure originality as a component of general creativity. This test was seen as a simple one and was easily administered. Its scores were used for ranking individuals in a given group. The test reliability and validity were similar to that found in tests developed by Taylor, Torrance, or Welsch (Johnson, 1976).

Drawing Completion Task. Davidson and Greenberg (1976) developed a test to measure creativity and divergent production in figural materials in children from eight years of age to adults. The test consists of eight simple incomplete, ambiguous line drawings and instructs the test-taker to complete them in any way he/she wishes. Regarding the test reliability and validity, using a sample of 40 children, the percentage of agreement between scorers for four of the incomplete drawings, ranged from .68 to .90 for the seven dimensions (Johnson, 1976).

Scale for Rating Behavioral Characteristics of Superior Students.

(SRBCSS). This rating scale was constructed by joint authors, Renzulli and Hartman (1976) to measure learning, motivation, leadership, and creativity in children from elementary to high school age. There are thirty-seven items in the rating scale. Each item was rated from 1 ("if you have seldom or never observed this characteristic") to 4 ("if you have observed this characteristic almost all the time"). Below is an example regarding the creativity characteristic:

Displays a great deal of curiosity about many things; is constantly asking questions about anything and everything (Johnson, 1976, vol. 1, p. 373).

The reliability of this test ranged from .67 to .91. The scales also significantly discriminated between known groups of gifted and average students (Johnson, 1976).

Draw-A-Scene Test. This creative test was constructed by Lowenfeld (1971) for the children from the age two to seventeen to measure growth, including intellectual, emotional, social, physical, aesthetic, and creative growth. Lowenfeld provided a framework that can be used to evaluate the spontaneous drawing of students to obtain measures of growth in the areas mentioned above. However, no data have been provided regarding the reliability and validity of this test.

In summary, creativity tests are still in a primitive stage of development. Many forms of creative tests have been developed such as rating scales, verbal expressions, and non-verbal or figural tests; but in most instances the reliability and validity of these forms are not satisfactorily substantiated. Though the measurement of creativity needs more refinement, tests with adequate reliability and validity have been

developed for use in research studies such as this.

V. Summary and Conclusions from Reviewed Literature

This review of related literature has included the concept of creativity, the influence of culture on creative thinking, the relationship between sexes and creative thinking, and measurement of creativity. From these studies reviewed, the investigator concluded that there is sufficient evidence to support the hypothesis that different cultures foster different degrees of creativity, and that the sexes will also show different degrees of creativity.

This review of related literature has also shown that nothing has been done in the field of creativity which is comparable to this research in which a comparison of creativity between the male and female Vietnamese, Filipino, and Anglo-American college undergraduate students will be made. Therefore, the investigator has concluded that such a study is valid. The research design and the procedures which were used in this study will be presented in chapter III.

Chapter III

Description of the Design and Procedure of the Study

The purpose of this study was to investigate and compare the degree of creative thinking of Vietnamese, Filipino, and Anglo-American college undergraduate students as measured by the Torrance tests of Thinking Creatively with Pictures (TCWP), form A, and Thinking Creatively with Words (TCWW), form A; to examine the difference, if any, of creative thinking scores between males and females in the three groups of students tested; and to determine the difference, if any, of the TCWP scores and the TCWW scores among the Vietnamese, Filipino, and Anglo-American college undergraduate students tested.

In this chapter, a description of the design and the procedure used in the development and implementation of this investigation are presented in detail. Five main headings are discussed: (a) population and sample of the study, (b) selection and administration of the instruments, (c) description of the instruments, (d) research methodology, (e) statistical procedure, and a summary.

I. Population and Sample of the Study

The parent population of this study consisted of all presently attending Vietnamese, Filipino, and Anglo-American college undergraduate students throughout the United States. The target population consisted of all Vietnamese, Filipino, and Anglo-American college undergraduate students presently attending at the University of the Pacific and San Joaquin Delta Community College in Stockton, California, as well as

Modesto Community College, Modesto, California.

In this study, Vietnamese college undergraduate students were defined as those who were actively involved and currently enrolled in a Bachelor's degree program in a university or college in the United States, who were born in Vietnam; now living in the United States, and were still speaking their mother language at home. Filipino college undergraduate students were those who were actively involved and currently enrolled in a Bachelor's degree program in a university or college in the United States, who were born in the Philippines; now living in the United States, and were still speaking their mother language at home. Anglo-American college undergraduate students were those who were actively and currently enrolled in a Bachelor's degree program in a university or college in the United States, and who were white, or non-Spanish descent, and born in the United States. In addition, English was their mother language, and was spoken in the home.

The University of the Pacific is an accredited four year institution located in Stockton, California. The total enrollment in the Spring Semester of 1980 for undergraduate study was 3,512 students. Among these, 23 were Vietnamese, and 19 were Filipino. The San Joaquin Delta Community College, also located in Stockton, California, is a two year community funded institution. The total enrollment in the Spring Semester of 1980 was 16,796 students. Among these, 214 were Vietnamese, and 283 were Filipino. The Modesto Community College, located in Modesto, California, is also a community funded two year institution. The total enrollment in the Spring Semester of 1980 was 14,590 students. Among these, 197 were Vietnamese, and 32 were Filipino.

Students selected for this study were not ranked into separate

groups by either age or level of years in the undergraduate program. In each group, in order to obtain fifteen male and fifteen female students who agreed to take the Torrance Tests of Creative Thinking (TTCT), the following procedures were undertaken:

Selection and randomization of the Vietnamese and the Filipino group.

The researcher asked the Deans of Students in all the three institutions to allow him to investigate the bilingual files to determine the number of male and female students in the Vietnamese and Filipino files. He then arranged the names of these students in each group in two lists in alphabetical order, one for male, one for female. Each student in each group was also assigned a number ranging from one to the last number of the last student in each group. In order to obtain fifteen males and fifteen females in each group, the researcher randomly selected twenty-five males and twenty-five females by use of a table of random numbers. The selection of ten extra students in each sub-group was instituted because of the inevitable attrition involved in asking people to volunteer for a study. After making random selection, each student was asked whether he/she was born in his/her fatherland, still speaking his/her mother language in the home, and willing to take the tests.

Selection and randomization of the Anglo-American group. Because of the large number of Anglo-American students in each institution, the selection and randomization procedures were different from those performed with the Vietnamese and Filipino groups. First, the researcher asked the computer office of each institution to provide a list of all male and female students. Each male and female of each institution was then assigned a number ranging from one to the last number for the last male or female. Using a table of random numbers, he selected fifteen males and

fifteen females in each institution. In the next step, he arranged the names of the 45 male and 45 female students previously selected from the three institutions into two lists in alphabetical order, one for male and one for female. Each student in each group was also assigned a number ranging from one to forty-five. In order to obtain fifteen males and fifteen females without distinction in these three institutions, he randomly selected twenty-five males and twenty-five females by use of the table of random numbers. The ten extra students in each sub-group were selected for the reasons cited above. Before telephoning to each student in each ethnic group, the investigator sent to him/her a request letter as reprinted in appendix A. Table 3 illustrates the distribution of students in each institution ultimately involved in the study.

Table 3
Distribution of Students in Each Institution
Ultimately Involved in the Study

Sex	Vietnamese			Filipino			Anglo-American			Total
	U*	D*	M*	U	D	M	U	D	M	
M	2	9	4	0	13	2	6	6	3	45
F	1	7	7	2	11	2	4	5	6	45
Total	3	16	11	2	24	4	10	11	9	90

*** U, D, and M stand for the University of the Pacific, San Joaquin Delta College, and Modesto Community College respectively.

II. Selection and Administration of the Instruments

The main premise of this study was that there were culturally related differences in creativity among Anglo-American, Vietnamese, and Filipino

college undergraduate students. The study involved the comparison of the creativity of male and female Vietnamese, Filipino, and Anglo-American college undergraduate students, as measured by the TTCT. A discussion concerning the selection and administration of these tests included in this study is listed below:

These tests were designed by E. Paul Torrance in 1966 and were a revision of his 1963 edition of the Minnesota Tests of Creative Thinking. There are two different types, one is figural, Thinking Creatively with Pictures (TCWP), another is verbal, Thinking Creatively with Words (TCWW). In each type, there are two versions, Figural Form A, Figural Form B, and Verbal Form A, Verbal Form B. The Figural Form A and the Verbal Form A version of the tests were used in this study. Instructions for the administration of the two types of tests were not the same. The figural and the verbal form must be administered separately.

All Torrance tests use write-in booklets that can be scored only by hand. Raw scores and T-scores are entered on scoring worksheets. Torrance (1972, 1974a) stated that his creativity tests can be used from kindergarten through graduate school. He also related that these tests were used by the Runners (1965) in testing minority group members. Torrance (1974b) also described how he had supplied his tests to students with different cultural backgrounds.

The Vietnamese and Filipino college undergraduate students were administered the test of TCWP and of TCWW in English and in their native language, that is in Vietnamese or Tagalog. The Vietnamese students have Vietnamese as their native language while the Filipino may have English as their native language. According to Catapusan (1940), the Philippine Constitutional Convention of 1935 decided to adopt English as the Islands'

national language and English has been used as a medium of expression in the Islands' public schools. In any case, if a student needed a translation of the test to his/her own language, this translation was provided. The researcher translated the TCWP and the TCWW into Vietnamese. A Filipino translated these two tests into Tagalog. These two translations were back-translated into English by a different Vietnamese and a different Filipino who know English well but did not know the original of these two tests. These back-translations were then submitted to three American professors who served as judges. When at least two of them agreed on the correctness of the meaning of the back-translations, they were accepted. The Anglo-American college undergraduate students of this study were administered the test of TCWP and TCWW only in English.

An Anglo- and a Filipino-American were trained in administering the TCWP and the TCWW. The researcher administered the tests to the Vietnamese students. If a testee answered any test(s) or a part of these tests in his/her native language, his/her tester would translate that answer into English. The translation would then be submitted to three Filipino or three Vietnamese who served as judges and understood English well. When at least two judges of each group (Filipino or Vietnamese) agreed on the translation(s), it was then considered acceptable. The tests were administered between March 27 and April 11, 1980, at San Joaquin Delta College for all the three groups. Each student was tested with both instruments, the TCWP and the TCWW at the same time. All students took the TCWP first and the TCWW second, with a break of 15 minutes between the two tests.

Regarding the problem of scoring the Torrance tests of creativity, based on the results of his own experiments, Torrance (1974a) clearly

stated that "it was not necessary to have special training in scoring these tests to assure reliable results" (p. 10). He added immediately, however, that "what does appear to be necessary is that the scorer read and follow the guide as a basis for judgment" (p. 10). Keeping the above instructions in mind, the researcher, a Vietnamese, diligently studied the two scoring guides, one for Verbal Test Booklet A, and one for Figural Test Booklet A. He faithfully followed these guides and he scored the tests himself. To test the reliability of his scoring, he scored six verbal tests and six figural tests. One week and two weeks later, he re-scored these same tests. The correlations between the three times of scoring were shown in Table 4. He also asked an Anglo-American elementary teacher, a 37 year old married woman, to study carefully the scoring guides of the two forms, Verbal Tests Booklet A, and Figural Test Booklet A, that is the same scoring guides he had studied himself. After seeing herself as mastering the scoring method and techniques, she scored the same six verbal tests and six figural tests as he did before. Inter-rater reliability and cross-cultural validity between the two scorers were shown in Table 5. The T-scores were used in the data analyses.

III. Description of the Instruments

The Torrance's test of TCWP and that of TCWW were used as measures of creative thinking in this study. The TCWP consists of three activities. In activity one, the testee is instructed to draw whatever he/she wants to, with the proviso that a curved shape provided in the text booklet be used as a part of the complete picture. The student was told "to think of a picture that no one else will think of" (p. 2). When he/she had completed the picture, he/she was told to provide a name or a

Table 4
 The Correlation between the Three Times
 of Scoring, Given one Week (1 Wk) and Two Weeks (2 Wks) Apart

Verbal						Figural							
Fluency		Flexibility		Originality		Fluency		Flexibility		Originality		Elaboration	
1 wk	2 wks	1 wk	2 wks	1 wk	2 wks	1 wk	2 wks	1 wk	2 wks	1 wk	2 wks	1 wk	2 wks
.98	.96	.97	.98	.95	.91	.98	.98	.98	.95	.92	.90	.94	.92

Table 5
 Inter-rater Reliability and Cross-cultural
 Validity between the Two Scorers

Verbal			Figural			
Fluency	Flexibility	Originality	Fluency	Flexibility	Originality	Elaboration
.98	.96	.92	.98	.95	.90	.92

title for it. This activity yielded scores on Originality and Elaboration. In activity two, the student was supplied with ten incomplete figures, then asked to add lines to them to sketch "some interesting objects or pictures" (p. 4). This activity and the next activity yielded scores on Fluency, Flexibility, Originality, and Elaboration. In activity three, 30 pairs of lines were arranged in ten rows, three pairs to each row. The testee was asked to draw as many objects or pictures including 30 pairs of lines within a ten-minute time span as he could.

The TCWW consists of seven activities which are (a) Asking (the testee looks at the test picture, then "ask all of the questions you would need to ask to know for sure what is happening."); (b) Guessing Causes ("List as many possible causes as you can of the action" shown in the picture); (c) Guessing Consequences ("List as many possibilities as you can of what might happen as a result of what is taking place" in the test picture); (d) Product Improvement (changing a toy to be more interesting); (e) Unusual Uses (with cardboard boxes); (f) Unusual Questions ("You are to think of as many questions as you can about cardboard boxes."); and finally, (g) Just Suppose ("Just suppose clouds had strings attached to them which hang down to earth, what would happen?"). What is most emphasized in the TCWW is that, in any activity, the testee is urged to write whatever he/she considers vitally unusual, original, or unique. The TCWW yield scores on Fluency, Flexibility, and Originality.

A review of studies of the reliability and validity of Torrance's tests on creativity indicates that the consistency of scoring and agree-

ment between scorers on these tests is quite high (Callahan, 1978). Regarding the TCWP and the TCWW, Wallach (1970), in his review, stated that the parts of the tests likely to evaluate creativity apart from intelligence are ideational fluency and fluency-related forms of originality. Torrance (1974b) pointed out that mean reliability coefficients for the figural tests range from .88 for originality to .96 for fluency. Mean reliability for the verbal tests range from .94 for originality to .99 for fluency. He also related that Sommers (1961) tested and retested two different samples of college students with an elapsed time between testings of ten weeks. Sommers reported reliabilities of .97 and .80 for his two samples.

Regarding the validity of these tests, Torrance stated that since a person can behave creatively in an almost infinite number of ways, it is impossible to provide all researchers and potential users of tests of creative thinking satisfactory evidence of validity. "The concept of an overall validity coefficient for tests of creative thinking ability is grossly inappropriate" (1974b, p. 21). He considered creativity as a process. With this approach, one can think in terms of the kinds of abilities necessary for the successful operation of the process in various situations, or for the production of various kinds of products, or of the qualities of the products resulting from the process. One can also think of the kinds of personality characteristics, group dynamic variables, and other environmental characteristics that facilitate or impede the kinds of functioning done in the process. This is the general approach used by Torrance in developing and validating tests of creating thinking. Regarding concurrent validity, for example, Bowers (1966) investigated the degree to which the abilities measured by

intelligence tests and tests of creative thinking contribute to school achievement. His subjects were 135 male and 143 female ninth graders. The battery of Torrance Tests of Creative Thinking administered included the Ask-and-Guess Test, Incomplete Figures, Quick Associations, Make-Up Problems, Product Improvement, and Unusual Uses. Intelligence was measured by the Otis Quick-Scoring Test of Mental Ability. The achievement criteria used were the teacher grades and the scores on the Iowa Test of Educational Development. Bowers reduced the number of creativity scores, through factor analysis, to ten and then computed both zero order correlations and multiple correlations of intelligence scores and the ten creative thinking scores separately for females, males and the total sample. Torrance (1974b, p. 42) organized the results of the Bowers' study in a table and it was reproduced in Table 6. In this table it was noted that the more sophisticated measure developed by Bowers yielded better prediction than raw scores. Moreover, Bowers did not include measures of elaboration which are considered rather achievement related; also some of the measures of originality had not been developed at the time Bowers analyzed his data (Torrance, 1974b).

When the manual of the TTCT was republished in 1974, five long-range prediction studies had been reported. Torrance (1974b, p. 45) summarized the results of these studies in a table and that table was reproduced in Table 7. The first long-range prediction study was in 1958 with 325 elementary education majors at the University of Minnesota as the subjects. Eight years later, follow-up data were obtained from 114 of the subjects still in elementary education (Torrance, Tan & Allman, 1970). A composite index of creative teaching behavior was devised and found to correlate .62 with the originality score and .57 with the total creativity

Table 6

Zero Order and Multiple Correlations of Intelligence Test Scores
and Ten Creative Thinking Scores for Males, Females, and Total Sample

Predictor	Males N = 135	Females N = 143	Both Sexes N = 278
Iowa Tests of Educational Development Criterion:			
Intelligence Test Score Alone	.72	.81	.77
Creative Thinking Alone	.65	.77	.72
Intelligence Test Score and Creative Thinking	.78	.86	.82
Grade Point Average Criterion:			
Intelligence Test Score Alone	.42	.67	.57
Creative Thinking Alone	.52	.65	.62
Intelligence Test Score and Creative Thinking	.54	.74	.66

Table 7

Summary of Long-range Predictive Validity Studies of the
Torrance Tests of Creative Thinking

Investigator and date	Sample	Number	Length Study	Behavior Predicted	r
Torrance, Tan. & Allman, 1970	Junior Elem. Ed. Majors	114	8 yrs.	Creative Teaching Behavior	.62* .57*
Torrance, 1969	12th Graders	46	7 yrs.	Highest Creative Achievement Quantity of Creative Achievement Creativeness of Aspiration	.50* .46* .51*
Cropley, 1971, 1972	7th Graders	111	5 yrs.	Creative Achievement Out of School	.51*
Witt, 1971	2-4 Graders	16	6 yrs.	Achievements in Creative Arts and Science	--
Torrance, 1971b	7-12 Graders	236	12 yrs.	Quant. & Qual. of Creative Achievements	.51*
	Females	117	12 yrs.		.46*
	Males	119	12 yrs.		.59*

*Significant at better than the .01 level

score. Teacher trainees identified as highly original in their thinking during their junior year appeared to be more alive, more involved in their teaching, and behaved more creatively in the classroom than their less original counterparts.

IV. Research Methodology

This investigation represented an ex post facto type of research. It was classified as ex post facto design because it was not possible to manipulate the independent variables, namely, ethnicity and sex; students enrolled in the three institutions as they did, not as the researcher manipulated them. They came to the study with the effects of their culture embodied in their own characters as they were. There was, however, total randomization across the three schools participating in the study, as previously described.

The researcher started with the dependent variable, creative thinking, and among the many possible influential independent variables, he selected ethnicity and sex of college undergraduate students as those which would be important to study. No effort was made to manipulate the independent variables, ethnicity and sex of college undergraduate students. The ex post facto character of this investigation is, therefore, in evidence. The randomization made the selection as representative as possible of these populations, within the constraints previously noted. It might also be pointed out that the colleges and university selected to participate in this study were not selected among volunteers.

Even though the sampling procedures were not random, every effort was made to provide adequate controls for validity, internal and external as well. The results of this study should be able to be generalized within the limitations stated to the populations of interest.

V. Statistical Procedure

The following null hypotheses will be tested by statistical tests as described below. The level of significance for rejecting the null hypotheses was set at .05. This level of significance equaled out possibilities of a Type I and Type II error. With such a level of significance, it was expected that incorrect decisions could be minimized in this study.

The Analysis of Variance (ANOVA) was used to test the null hypotheses, due to the particular kind of data collected in this research. The Torrance tests of creativity used in this study were the TCWP and the TCWW. These tests were employed in measuring the variables of Fluency, Flexibility, Originality, and Elaboration.

H_1 : There are no differences among the Anglo-American, Vietnamese, and Filipino college undergraduate students on (a) Fluency, (b) Flexibility, (c) Originality, and (d) Elaboration as measured by the TCWP.

H_2 : There are no differences among the Anglo-American, Vietnamese, and Filipino college undergraduate students on (a) Fluency, (b) Flexibility, and (c) Originality as measured by the TCWW.

H_3 : There are no differences between males and females across the three ethnic groups on (a) Fluency, (b) Flexibility, (c) Originality, and (d) Elaboration as measured by the TCWP.

H_4 : There are no differences between males and females across the three ethnic groups on (a) Fluency, (b) Flexibility, and (c) Originality as measured by the TCWW.

H_5 : The TCWP and the TCWW scores do not correlate in the Vietnamese group on (a) Fluency, (b) Flexibility, and (c) Originality.

H_6 : The TCWP and the TCWW scores do not correlate in the Filipino

group on (a) Fluency, (b) Flexibility, and (c) Originality.

H_7 : The TCWP and the TCWW scores do not correlate in the Anglo-American group on (a) Fluency, (b) Flexibility, and (c) Originality.

Statistical techniques used to test the above hypotheses are illustrated in Table 8.

Table 8
Statistical Analyses

Hypotheses	Analyses	Dependent variable(s)	Independent variable(s)	Control variable(s)
$H_{1,2,3,4}$	Two-way ANOVA	TCWP scores TCWW Scores	Ethnicity Sex	
$H_{5,6,7}$	Correlation by Sub-groups	TCWW scores	TCWP scores	Ethnicity

VI. Summary

In chapter III the design and procedure of the study have been presented. The five main headings have been discussed: (a) population and sample of the study; (b) selection and administration of the instruments; (c) description of the instruments; (d) research methodology; and (e) statistical procedure. The level of significance for accepting the hypotheses tested was established at .05. A listing of the hypotheses investigated in this study was also included.

Chapter IV offers the findings of the study from the application of the instruments and procedure specified in chapter III.

Chapter IV

Findings of the Study

It was the purpose of this study to investigate the degree of creative thinking of Vietnamese, Filipino, and Anglo-American college undergraduate students as measured by the Torrance tests of Thinking Creatively with Pictures (TCWP), form A, and Thinking Creatively with Words (TCWW), form A; the degree of creative thinking between males and females in the three groups of students tested; and the differences, if any, between the TCWP scores and the TCWW scores of the Vietnamese, Filipino, and Anglo-American college undergraduate students tested.

This chapter presents the findings of the investigation in four sections: (a) those comparisons between male and female Vietnamese, Filipino, and Anglo-American college undergraduate students on the figural sub-tests; (b) those comparisons between male and female Vietnamese, Filipino, and Anglo-American college undergraduate students on the verbal sub-tests; (c) the correlation between the TCWP scores and the TCWW scores for each of the ethnic sub-groups; and (d) a summary.

I. Results of the Figural Sub-tests

Four results of the figural sub-tests or the TCWP will be presented in this section. They are creative abilities which relate to Fluency, Flexibility, Originality, and Elaboration.

Figural Fluency Results

Two hypotheses were stated in chapter III relating to the creative ability factor of Fluency as measured by the TCWP. These hypotheses were:

H_{1a}: There are no differences among the Anglo-American, Vietnamese, and

Filipino college undergraduate students on Fluency as measured by the TCWP.

H_{3a} : There are no differences between males and females across the three ethnic groups on Fluency as measured by the TCWP.

An examination of Table 9 showed that hypotheses H_{1a} and H_{3a} were rejected. There was no interaction between these variables. The Tukey Honestly Significant Difference (HSD) showed that the Filipino and Vietnamese differed in their responses with the Filipinos having higher Fluency scores than the Vietnamese. There were no differences between either the Vietnamese and the Anglo-Americans or the Anglo-Americans and the Filipinos in their Fluency responses. The females across all groups showed higher scores than males. Thus it appeared that differences existed in Fluency but only between two of the ethnic groups. There were differences between the sexes in their responses to this sub-test also.

Figural Flexibility Results

Two hypotheses were stated in chapter III relating to the creative ability factor of Flexibility as measured by the TCWP. These hypotheses were:

H_{1b} : There are no differences among the Anglo-American, Vietnamese, and Filipino college undergraduate students on Flexibility as measured by the TCWP.

H_{3b} : There are no differences between males and females across the three ethnic groups on Flexibility as measured by the TCWP.

An examination of Table 10 showed that hypothesis H_{1b} was rejected while hypothesis H_{3b} was accepted. There was no interaction between these variables. The Tukey HSD showed that the Anglo-Americans and the Filipinos differed in their responses on this sub-test with the Anglo-Americans having higher Flexibility scores than the Filipinos. There were no

Table 9
ANOVA of Ethnic Groups by Sex with the
TCWP Fluency Sub-test

Source	Sum of Squares	df	Mean Square	F	Signif. of F
Ethnic groups	2646.422	2	1323.211	7.379	0.001
Sex	1545.578	1	1545.578	8.620	0.004
Ethnic x Sex	11.089	2	5.544	0.031	0.970
Within groups	15063.733	84	179.300		
Total	19267.122	89	216.485		

Means

Ethnic Groups				
Sex	Vietnamese	Filipino	Anglo-American	Total
Male	46.80	59.73	52.47	53.00
Female	55.33	68.73	59.80	61.29
Total	51.07	64.23	56.13	

Tukey HSD

	Anglo-American	Filipino
Vietnamese	_____	*
Anglo-American	_____	_____

Table 10
ANOVA of Ethnic Groups by Sex with the
TCWP Flexibility Sub-Test

Source	Sum of Squares	df	Mean Square	F	Signif. of F
Ethnic groups	1950.200	2	975.100	4.940	0.010
Sex	364.011	1	364.011	1.831	0.180
Ethnic x Sex	19.356	2	9.678	0.049	0.953
Within groups	16703.333	84	198.849		
Total	19036.900	89	213.898		

Means

Ethnic Groups				
Sex	Vietnamese	Filipino	Anglo-American	Total
Male	48.93	45.53	57.67	50.71
Female	45.00	42.60	52.47	46.69
Total	46.97	44.07	55.07	

Tukey HSD

	Vietnamese	Anglo-American
Filipino	_____	*
Vietnamese	_____	_____

differences between either the Filipinos and the Vietnamese or the Vietnamese and Anglo-Americans in their Flexibility responses. Thus it appeared that differences existed in Flexibility but only between two of the ethnic groups. There were no differences between the sexes on this variable.

Figural Originality Results

Two hypotheses were stated in chapter III relating to the creative ability factor of Originality as measured by the TCWP. These hypotheses were:

H_{1c} : There are no differences among the Anglo-American, Vietnamese, and Filipino college undergraduate students on Originality as measured by the TCWP.

H_{3c} : There are no differences between males and females across the three ethnic groups on Originality as measured by the TCWP.

An examination of Table 11 showed that hypothesis H_{1c} was accepted while hypothesis H_{3c} was rejected. There was no interaction between these variables. Thus it appeared that differences among these groups did not exist in Originality. There were differences, however, between the sexes in their responses to this sub-test. Male undergraduate students showed higher Originality responses than females in all three ethnic groups.

Figural Elaboration Results

Two hypotheses were stated in chapter III relating to the creative ability factor of Elaboration as measured by the TCWP. These hypotheses were:

H_{1d} : There are no differences among the Anglo-American, Vietnamese, and Filipino college undergraduate students on Elaboration as measured by the TCWP.

Table 11
ANOVA of Ethnic Groups by Sex with the
TCWP Originality Sub-test

Source	Sum of Squares	df	Mean Square	F	Signif. of F
Ethnic groups	704.356	2	352.178	2.069	0.133
Sex	677.878	1	677.878	3.982	0.049
Ethnic x Sex	37.956	2	18.978	0.111	0.895
Within groups	14301.200	84	170.252		
Total	15721.389	89	176.645		

Means

Sex	Ethnic Groups			Total
	Vietnamese	Filipino	Anglo-American	
Male	54.27	48.60	51.20	51.36
Female	49.27	41.33	47.00	45.87
Total	51.77	44.97	49.10	

H_{3d} : There are no differences between males and females across the three ethnic groups on Elaboration as measured by the TCWP.

An examination of Table 12 showed that hypothesis H_{1d} was rejected while hypothesis H_{3d} was accepted. There was no interaction between these variables. The Tukey HSD showed that there were differences between the Anglo-Americans and the Filipinos and between the Anglo-Americans and the Vietnamese in their responses on this sub-test with the Anglo-Americans having higher Elaboration scores than the Filipinos and the Vietnamese. There were no differences between the Vietnamese and the Filipinos in their Elaboration responses. There were also no differences between the sexes on these variables.

In summary, results of the figural sub-tests or the TCWP showed that differences existed in the creative ability factor of Fluency, Flexibility, and Elaboration between the three ethnic groups tested. No differences were found in the creative ability of Originality between these groups. There were differences between the sexes in their responses to the creative ability factors of Fluency and Originality, but no differences were found in the way the sexes responded on the factors of Flexibility and Elaboration. No interaction was found between the sexes of the three groups of students regarding any of the creative ability factors of Fluency, Flexibility, Originality, and Elaboration as measured by the TCWP.

II. Results of the Verbal Sub-tests

Three results of the verbal sub-tests on the Torrance test of TCWW will be presented in this section; these sub-tests are creative abilities which relate to Fluency, Flexibility, and Originality.

Table 12
ANOVA of Ethnic Groups by Sex with the
TCWP Elaboration Sub-test

Source	Sum of Squares	df	Mean Square	F	Signif. of F
Ethnic Groups	5480.867	2	2740.433	21.380	0.000
Sex	49.878	1	49.878	0.389	0.534
Ethnic x Sex	205.356	2	102.678	0.801	0.452
Within Groups	10766.800	84	128.176		
Total	16502.900	89	185.426		

Means

Ethnic Groups				
Sex	Vietnamese	Filipino	Anglo-American	Total
Male	49.60	47.53	67.53	54.87
Female	54.80	49.00	65.33	56.38
Total	52.20	48.27	66.43	

Tukey HSD

	Vietnamese	Anglo-American
Filipino	—	*
Vietnamese	—	*

Verbal Fluency Results

Two hypotheses were stated in chapter III relating to the creative ability factor of Fluency as measured by the TCWW. These hypotheses were:

H_{2a} : There are no differences among the Anglo-American, Vietnamese, and Filipino college undergraduate students on Fluency as measured by the TCWW.

H_{4a} : There are no differences between males and females across the three ethnic groups on Fluency as measured by the TCWW.

An examination of Table 13 showed that hypotheses H_{2a} and H_{4a} were accepted. There is no interaction between these variables. Thus it appeared that differences did not exist in Fluency as measured by the TCWW. There were also no differences between the sexes in their responses to this sub-test.

Verbal Flexibility Results

Two hypotheses were stated in chapter III relating to the creative ability factor of Flexibility as measured by the TCWW. These hypotheses were:

H_{2b} : There are no differences among the Anglo-American, Vietnamese, and Filipino college undergraduate students on Flexibility as measured by the TCWW.

H_{4b} : There are no differences between males and females across the three ethnic groups on Flexibility as measured by the TCWW.

An examination of Table 14 showed that hypothesis H_{2b} was rejected while hypothesis H_{4b} was accepted. There was no interaction between these variables. The Tukey HSD showed that the Anglo-Americans and the Filipinos differed in their responses on this sub-test with the Anglo-Americans having higher Flexibility scores than the Filipinos. There were no

Table 13
ANOVA of Ethnic Groups by Sex with the
TCWW Fluency Sub-test

Source	Sum of Squares	df	Mean Square	F	Signif. of F
Ethnic Groups	500.422	2	250.211	0.582	0.561
Sex	202.500	1	202.500	0.471	0.494
Ethnic x Sex	10.867	2	5.433	0.013	0.978
Within Groups	36114.533	84	429.935		
Total	36828.322	89	413.801		

Means

Ethnic Groups				
Sex	Vietnamese	Filipino	Anglo-American	Total
Male	49.33	54.53	51.67	51.84
Female	51.40	57.73	55.40	54.84
Total	50.37	56.13	53.53	

Table 14
ANOVA of Ethnic Groups by Sex with the
TCWW Flexibility Sub-test

Source	Sum of Squares	df	Mean Square	F	Signif. of F
Ethnic Groups	2545.422	2	1272.711	3.494	0.035
Sex	490.000	1	490.000	1.345	0.249
Ethnic x Sex	96.267	2	48.133	0.132	0.876
Within Groups	30597.867	84	364.260		
Total	33729.556	89	378.984		

Means

Ethnic Groups				
Sex	Vietnamese	Filipino	Anglo-American	Total
Male	44.07	44.13	57.47	48.56
Female	41.53	40.13	50.00	43.89
Total	42.80	42.13	53.73	

Tukey HSD

	Vietnamese	Anglo-American
Filipino	_____	*
Vietnamese	_____	_____

differences between either the Anglo-Americans and the Vietnamese or the Vietnamese and the Filipinos in the Flexibility responses as measured by the TCWW. Thus it appeared that differences existed in Flexibility but only between two of the ethnic groups. There were no differences between the sexes on these variables.

Verbal Originality Results

Two hypotheses were stated in chapter III relating to the creative ability factor of Originality as measured by the TCWW. These hypotheses were:

H_{2c} : There are no differences among the Anglo-American, Vietnamese, and Filipino college undergraduate students on Originality as measured by the TCWW.

H_{4c} : There are no differences between males and females across the three ethnic groups on Originality as measured by the TCWW.

An examination of Table 15 showed that both hypotheses H_{2c} and H_{4c} were accepted. There was no interaction between these variables. Thus it appears that cultural differences do not exist in Originality as measured by the TCWW. There are also no differences between the sexes in their responses to this sub-test.

In summary, results of the verbal sub-tests on the TCWW showed that differences existed in the creative ability factor of Flexibility between the three ethnic groups tested. No differences were found in the creative ability factor of Fluency and Originality between these groups. There were no differences between the sexes in their responses to any of the creative ability factors of Fluency, Flexibility, and Originality as measured by the TCWW. There were no interactions among all these variables.

Table 15
ANOVA of Ethnic Groups by Sex with the
TCWW Originality Sub-test

Source	Sum of Squares	df	Mean Square	F	Signif. of F
Ethnic Groups	395.356	2	197.678	0.466	0.629
Sex	168.100	1	168.100	0.397	0.531
Ethnic x Sex	1.667	2	0.833	0.002	0.998
Within Groups	35612.533	84	423.959		
Total	36177.656	89	406.491		

Means

Sex	Ethnic Groups			Total
	Vietnamese	Filipino	Anglo-American	
Male	58.00	52.53	55.20	55.24
Female	54.93	50.13	52.47	52.51
Total	56.47	51.33	53.83	

III. Correlation Between the TCWP Scores

and the TCWW Scores for each of Ethnic Sub-groups

Correlation between the TCWP Scores and the TCWW Scores for the Vietnamese Group

One hypothesis was stated in chapter III relating to the correlation between the TCWP scores and the TCWW scores of the Vietnamese group.

This hypothesis was:

H_5 : The TCWP and the TCWW scores do not correlate in the Vietnamese group on (a) Fluency, (b) Flexibility, and (c) Originality.

Table 16 indicated that for the Vietnamese group tested, there was no correlation between the TCWP score and the TCWW scores with respect to the creative ability factors of Fluency and Flexibility. However, there was a correlation between the scores of these two tests with regard to Originality as it applied to creative thinking. The Pearson product-moment correlation data of Table 16 indicated that the null hypotheses H_{5a}

Table 16

Correlation between the TCWP Scores and the TCWW Scores
of the Vietnamese College Undergraduate Students

	FigFlT	FigFlxT	FixOrT
VerFlT	.02777 p=.069		
VerFlxT		.2325 p=.108	
VerOrT			.4824 p=.003

and H_{5b} were accepted but the null hypothesis H_{5c} was rejected. These Originality scores were positively related but only to a moderate degree. This moderate positive relationship indicated that students who showed greater amounts of Originality in response to a figural stimulus also showed greater amounts of Originality in response to a verbal stimulus.

Correlation between the TCWP Scores and the TCWW Scores for the Filipino Group

One hypothesis was stated in chapter III relating to the correlation between the TCWP scores and the TCWW scores of the Filipino groups. This hypothesis was:

H_6 : The TCWP and the TCWW scores do not correlate in the Filipino group on (a) Fluency, (b) Flexibility, and (c) Originality.

Table 17 indicated that for the Filipino group tested, there was no

Table 17

Correlation between the TCWP Scores and the TCWW Scores
of the Filipino College Undergraduate Students

	FigFlT	FigFlxT	FigOrT
VerFlT	.2823 p=.065		
VerFlxT		.2076 p=.135	
VerOrT			.4921 p=.003

correlation between the TCWP scores and the TCWW scores with respect to the creative ability factors of Fluency and Flexibility. However, there was a correlation between the scores of these two tests with regard to

Originality as it applied to creative thinking. The Pearson product-moment correlation data of Table 17 indicated that the null hypotheses H_{6a} and H_{6b} were accepted but the null hypothesis H_{6c} was rejected. These Originality scores were positively related but only to a moderate degree. This moderate positive relationship indicated that students who showed greater amounts of Originality in response to a figural stimulus also showed greater amounts of Originality in response to a verbal stimulus.

Correlation between the TCWP Scores and the TCWW Scores for the Anglo-American Group

One hypothesis was stated in chapter III relating to the correlation between the TCWP scores and the TCWW scores of the Anglo-American group. This hypothesis was:

H_7 : The TCWP and the TCWW scores do not correlate in the Anglo-American group on (a) Fluency, (b) Flexibility, and (c) Originality.

Table 18 indicated that for the Anglo-American group tested, there

Table 18

Correlation between the TCWP Scores and the TCWW Scores
of the Anglo-American College Undergraduate Students

	FigFlT	FigFlxT	FigOrT
VerFlT	.2154 p=.126		
VerFlxT		.1889 p=.159	
VerOrT			.4768 p=.004

was no correlation between the TCWP scores and the TCWW scores with respect to the creative ability factors of Fluency and Flexibility. However, there was a correlation between the scores of these two tests with regard to Originality as it applied to creative thinking. The Pearson product-moment correlation data of Table 18 indicated that the null hypotheses H_{7a} and H_{7b} were accepted but the null hypothesis H_{7c} was rejected. These Originality scores were positively related to a moderate degree. This moderate positive relationship indicated that students who showed greater amounts of Originality in response to a figural stimulus also showed a greater amount of Originality in response to a verbal stimulus.

In summary, for the Vietnamese, Filipino, and Anglo-American students tested, there was no correlation between the TCWP scores and the TCWW scores with respect to Fluency and Flexibility as they applied to creative thinking. However, for all three groups tested, a moderate positive correlation was found in the creative ability factor of Originality. To say it in other terms, Vietnamese, Filipino, and Anglo-American students who showed greater amounts of Originality in response to a figural stimulus also showed greater amounts of Originality in response to a verbal stimulus.

IV. Summary

Results of the TCWP and the TCWW, as summarized in Table 19, showed that cultural differences existed in the creative ability factor of Flexibility among the three groups of students tested. The TCWP also showed differences among these groups with regard to Fluency and Elaboration while the TCWW did not show any differences with regard to these two factors. Results of the TCWP and the TCWW showed that no differences were found in the creative ability factor of Originality.

Table 19

Summary Table of Results of the TCWP and the TCWV Scores
for Male and Female Vietnamese, Filipino, and Anglo-American College
Undergraduate Students, and of the Correlation between these Two Tests Scores

Creative ability factors	TCWP		Correlation between TCWP & TCWV scores	TCWV	
	Ethnicity	Sex		Ethnicity	Sex
Fluency	$F^* > V^*$ $(\bar{X} = 64.23)$ $(\bar{X} = 51.07)$	$f^* > m^*$ $(\bar{X} = 61.29)$ $(\bar{X} = 53.00)$	-0-	-0-	-0-
Flexibility	$A^* > F$ $(\bar{X} = 55.07)$ $(\bar{X} = 44.07)$	-0-	-0-	$A > F$ $(\bar{X} = 53.73)$ $(\bar{X} = 42.13)$	-0-
Originality	-0-	$m > f$ $(\bar{X} = 51.36)$ $(\bar{X} = 45.87)$	$p = .003(V)$ $= .003(F)$ $= .004(A)$	-0-	-0-
Elaboration	$A > F$ $(\bar{X} = 66.43)$ $(\bar{X} = 48.27)$ $A > V$ $(\bar{X} = 52.20)$	-0-	*** $m, f, V, F, A,$ and \bar{X} stand for male, female, Vietnamese, Filipino, Anglo-American, and Mean respectively.		

The TCWP showed differences between the sexes on the creative ability factors of Fluency and Originality while the TCWW did not show any differences between the sexes on these two factors. There were also no differences between the sexes in their responses to the factor of Flexibility as measured by the two tests. In addition, the TCWP showed no differences between the sexes in their responses to the factor of Elaboration. No interaction was found between sex and ethnic group with regard to any of the creative ability factors of Fluency, Flexibility, Originality, and Elaboration.

With regard to the correlation between the TCWP scores and the TCWW scores across the three ethnic groups tested, there was no correlation with respect to the factors of Fluency and Flexibility. However, a moderate positive correlation was found between the creative ability factor of Originality as measured by the TCWP and the TCWW in all the three groups tested. For the TCWP and the TCWW, Vietnamese, Filipino, and Anglo-American students who showed greater amounts of Originality in response to a figural stimulus also showed greater amounts of Originality in response to a verbal stimulus.

Chapter V offers a summary of the study and the investigator's discussion of the findings reported in this chapter. Conclusions and recommendations for further study are also offered by the investigator.

Chapter V

Summary, Conclusions and Recommendations

Different cultures stress different values. Some of these values may result in more convergent types of thought and behaviors while others may result in divergent thought and behaviors. Is there a relationship between culture and creativity? If so, does it differ in its effect on the American culture and the Oriental culture? It was the purpose of this study to investigate and compare the degree of creative thinking of Vietnamese, Filipino, and Anglo-American college undergraduate students as measured by the Torrance tests of Thinking Creatively with Pictures (TCWP), form A, and Thinking Creatively with Words (TCWW), form A; to examine the difference, if any, of creative thinking scores between males and females in all the three groups of students tested; and to determine the differences, if any, of the TCWP scores and the TCWW scores among the Vietnamese, Filipino, and Anglo-American college undergraduate students. The ex post facto design was used in this study because it was not possible to manipulate the independent variables, namely, ethnicity and sex. There was, however, total randomization across the three schools participating in the study, the University of the Pacific, the San Joaquin Delta College, and the Modesto Community College. The level of significance for rejecting the null hypotheses was set at .05. Statistical techniques used in this study were the two-way ANOVA and the Pearson product-moment correlation. This chapter was organized under four headings: (a) summary, (b) discussion,

(c) conclusions, and (d) recommendations.

I. Summary

The TCWP and the TCWW gave different results with regard to the four creative ability factors of Fluency, Flexibility, Originality, and Elaboration. Torrance (1974b) stated that the Fluency scores reflected the testee's ability to produce a large number of ideas; the Flexibility scores represented a person's ability to produce a variety of kinds of ideas, to shift from one approach to another, or from one category of thought to another; the Originality scores reflected the test-taker's ability to produce ideas that were away from the banal, commonplace, or established; and the Elaboration scores represented "the subject's ability to develop, embroider, embellish, carry out, or otherwise elaborate ideas" (p. 59).

Regarding the factor of Fluency, the TCWP showed differences between the Filipino and the Vietnamese students in the way they responded. The Filipinos had higher Fluency scores than the Vietnamese. There were no differences, however, between either the Vietnamese and the Anglo-Americans or the Anglo-Americans and the Filipinos in their Fluency responses. The TCWW did not show any differences among the three groups of students tested regarding this Fluency factor. Thus it appeared that cultural differences existed in the creative ability factor of Fluency but only between two of the ethnic groups, as measured by the TCWP, and not in the direction it was hypothesized. That is, the expected differences between American and Oriental did not appear. The TCWP showed differences between sexes while the TCWW did not show any difference between them with regard to the creative ability factor of Fluency. The females across all the

three groups showed higher Fluency scores than males as measured by the TCWP.

With respect to the creative ability factor of Flexibility, results of the TCWP and the TCWW showed that the Anglo-Americans and the Filipinos differed in their responses on this sub-test with the Anglo-Americans having higher Flexibility scores than the Filipinos. There were no differences either between the Vietnamese and the Filipinos or the Vietnamese and the Anglo-Americans in their Flexibility responses. Thus, it appeared that cultural differences existed in Flexibility but only between two of the ethnic groups tested, and in the direction hypothesized as measured by both the TCWP and the TCWW. The two tests did not show any differences between the sexes on this Flexibility variable.

Regarding the Originality variable, the TCWP and the TCWW did not show any differences among Vietnamese, Filipino, and Anglo-American college undergraduate students in the way they responded. Thus, it appeared that cultural differences did not exist in the creative ability factor of Originality. There were differences, however, between the sexes in their responses to this sub-test. Male college undergraduate students showed higher Originality scores than female college undergraduate students in all the three ethnic groups tested.

At the time this study was undertaken, the creative ability factor of Elaboration was measured only by the TCWP. The results of this figural test showed that there were differences between the Anglo-Americans and the Filipinos and also between the Anglo-Americans and the Vietnamese in their responses on this sub-test with the Anglo-Americans having higher Elaboration scores than either the Filipinos or the Vietnamese. There were no differences, however, between the Vietnamese and the Filipinos

factor of Fluency with the Filipinos having higher Fluency scores than the Vietnamese. This result was not as expected since it was originally hypothesized that differences, if any, would probably be between Anglo-Americans and either of the Oriental-American groups. The level of statistical significance for rejecting the null hypotheses of this study was set at .05. Though this level of significance could equal out possibilities of a Type I and a Type II error, "the risk is 5 in 100 that the researcher will incorrectly or erroneously reject the null hypothesis" (Sax, 1968, p. 381). Thus, one possible explanation for this difference between the way the Filipinos and the Vietnamese responded on the Fluency factor of the TCWP was that it could have happened by chance. However, there were other factors that could help to explain this difference.

Filipinos quieter during testing. First of all, this investigator observed that among the three groups of students tested, the Filipinos were quieter and appeared to listen more closely to the tester's explanation of how to take the test than either the Anglo-Americans or the Vietnamese. When the tester said, "Go ahead!", the Filipinos started immediately to draw as many pictures as possible. The Anglo-Americans, however, after listening to the tester's explanation, did not start to draw right away; some of them were apparently uncooperative, but after a while they became busy with their drawings. For the Vietnamese, instead of listening to the tester's instruction, many of them either talked to each other or read the instructions in Vietnamese and in English printed in the test-booklets. Apparently, the Vietnamese were more curious about the tests than the two other ethnic groups because

they were not sufficiently familiar with testing. Such a curiosity may have inhibited their production and they completed fewer pictures than their Oriental counterparts, the Filipinos.

Filipino culture possibly caused differences. Secondly, the Filipino culture could explain higher Fluency scores of the Filipino college undergraduate students. Bulatao (1964) observed that the hiya system in the Philippines made a Filipino eager to please other people, mostly to please authority figures. Because of his/her hiya, a Filipino prefers to do whatever a "powerful" person asks him/her to do. If he/she refuses to do so, other Filipinos may consider him/her as foolish and not accept his/her attitude and behaviors. This rejection would then result in the painful emotion of being discarded by his/her own people. It could be reasonable, therefore, to say that once a Filipino accepted the investigator's request to be involved in this study, he/she was also eager to please him by drawing as many pictures as possible.

The third element which could explain the superiority of the Filipinos on the Fluency scores was their fluency in English. As Catapusan (1940) wrote, the Philippine Constitutional Convention of 1935 decided to adopt English as the Islands' national language and English has been used as a medium of expression in the Islands' public schools. Actually, all Filipinos responded to all the test items in English; some of them seemed uncomfortable even in reading Tagalog. Catapusan also wrote that American schools had been introduced to the Philippines, American teachers had been there, and even the American culture had been welcomed. Living in such an educational and societal environment, the Filipino college undergraduate students could be expected to be more familiar

with the kind of tests such as the TCWP and the TCWW.

All of the Vietnamese college undergraduate students, however, answered the two tests in Vietnamese. Moreover, many of them had never taken any tests during their high school education in Vietnam. The American educational system was unknown or new to many of them. When working on the second test, the TCWW, the Vietnamese decreased their talking and responded to the test items more quietly. Probably because of that fact their Fluency scores on the verbal tests did not differ from the Fluency scores of their Oriental counterparts, the Filipinos.

Female students test higher in Fluency. Another finding relating to the Fluency variable was the fact that female college undergraduate students had higher Fluency scores than male college undergraduate students in all the three ethnic groups tested. The investigator observed that females in every group started more quickly than males in working on either the figural or the verbal test. The investigator had a hard time with the Vietnamese males; when instructed to "Go ahead!", instead of looking at their own paper and starting to draw pictures, they talked to each other.

Before attempting to explain why these differences occurred, the investigator recalled what was presented in earlier chapters regarding the ex post facto design; it was the design suitable to the purpose of this study. Kerlinger (1964), however, in discussing the limitations of ex post facto interpretations, stated that "compared to experimental research, other things being equal, ex post facto research lacks control; this lack is the basis of ... the risk of improper interpretation" (p. 373). Because of the nature of the research methodology used in this

study, it was difficult to point out a cause-and-effect relationship between the creative variable of Fluency and the sexes tested. The investigator, nevertheless, tended to refer to the findings of Shaw (cited in Yussen & Santrock, 1978), Diamond (1965), and Erikson (1968) for some interpretations. According to Shaw, every person inherits 23 chromosome pairs. The last pair determines the person's sex, consisting of an X and a Y chromosome. The female has two large X chromosomes, that is, genetic constitution XX. The male has only one X chromosome, and one male-determining Y chromosome which is much smaller than the X, that is, the male has genetic constitution XY. In line with Shaw's findings, Diamond (1965) investigated experimental and clinical cases dealing with anatomic, genetic, endocrine, and behavioral factors and concluded that humans are predisposed at birth to a female or male gender orientation. Thus, biological sex differences lead to functional sex differences and could result in sex differences in creative thinking and creative behaviors. Based on his elaborious research, Erikson (1968) concluded that females were more passive and inclusive while males were more aggressive and intrusive (cited in Yussen and Santrock, 1978). The aggressiveness of males was also reaffirmed by the Maccoby and Jacklin's (1974) findings. Based on the results of their study, the two authors concluded that in all cultures in which aggressive behavior has been observed, males were more aggressive than females, physically and verbally as well. Probably due to their aggressive and intrusive nature, males, mostly Vietnamese and Filipino males, continued either to talk to each other or to laugh alone while females listened more attentively to the tester's explanations then started to work more quickly on their papers.

This sex difference could be also attributable to the Oriental culture in which females were assigned a cooperative role while males were assigned a dominant role. As noted in the previous chapter, a Vietnamese male was instructed to keep the Three Relations of a Man's Duty while a Vietnamese female was taught to keep the Three Follows. A Filipino female liked to choose test items like, "I prefer to accept suggestions rather than insist on working things out my own way" (Guthrie, 1961, p. 167). To say it differently, a female in either Vietnamese or Filipino culture should follow the initiative of another person, mostly of a male authority figure. Thus, obedience or conformity in this case was "necessary to some degree" (Smith, 1966, p. 36), and had helped females complete more pictures than males. The creative ability factor of Fluency, however, as discussed later in this section, was only the first and least important factor among the four.

Flexibility Sub-test Results

With respect to the creative ability factor of Flexibility, the results of the TCWP and the TCWW were consistent in showing that the Anglo-American and the Filipino college undergraduate students differed in their responses on this sub-test with the Anglo-Americans having higher Flexibility scores than the Filipinos. Though the American educational system was introduced to the Philippines, according to Sechrest (1969), for the most part the Philippines has remained in the Latin tradition introduced by the Spanish or in "the Philippine custom" (p. 324). As noted in a previous chapter, this custom or tradition motivated loyalty to one's own group; ethnocentrism bound Filipino people together solidly and forced them to do most things similarly to other group members. Their family-bound relationship kept them within narrow

bounds and activities; in addition, the suppression of individuality by the Latin tradition and/or "Philippine custom" forbade them to do anything "strange" to others. With regard to the Filipino educational system, Bulatao (1969) observed that this system was based mainly on rote learning. Thus, the Filipino culture could be seen as fostering convergent thinking which would result in lower scores on Flexibility since higher scores on the factor of Flexibility might be a sign of exhibiting more divergent thinking.

In comparison with the Filipino and the Vietnamese culture, the American culture could be seen as leading in the area of nourishing the creative process because the American culture encouraged individual diversity and divergent thinking (Getzels & Jackson, 1962; Torrance, 1965). Moreover, democracy was highly appreciated by the American society (Coleman, et al, 1966; Tanner & Tanner, 1975). An important value characteristic of a democratic way of life is the use of the method of intelligence; thus the work of the American school was not regarded as the imposition of a single value system, but a clarification of alternatives (Vantil, 1974).

Though the Filipino college undergraduate students drew more pictures and wrote more sentences than the Vietnamese and the Anglo-American college undergraduate students, many of their pictures and sentences were of the same category of thought. For the Anglo-American college undergraduate students, probably because of the fostering of divergent thinking in their culture, their drawings and writings covered many different categories of thought; therefore, their Flexibility scores were higher than those of the Filipino college undergraduate students.

Originality Sub-test Results

The results of the TCWP and the TCWW did not show any differences among the three ethnic groups tested in the way they responded on this sub-test. The TCWP, however, and only the TCWP, did show differences between the sexes with regard to this Originality factor.

Torrance's explanation of TCWP and TCWW scores. Torrance (1974b) stated that the figural Fluency score was "useful primarily in helping the user understand the other figural scores" (p. 58). With respect to the verbal Flexibility scores, the author found that in some cases, extremely high Flexibility scores in relation to Fluency may characterize the person who "jumps from one approach to another and [who is] unable to stick to any one line of thinking long enough to really develop it" (p. 57).

When writing about the factor of Originality as measured by the TCWP as well as by the TCWW, Torrance (1974b) became more positive in his argument. According to him, the person who achieved a high Originality score usually had a great deal of intellectual energy and was "able to make big mental leaps or 'cut corners' in obtaining solutions" (Torrance, 1974b, p. 57). While the Fluency score was seen as "useful to understand other scores," the Originality score was judged as being important for distinguishing those people who were "able to make big mental leaps or 'cut corners' in obtaining solutions" from those who were not.

Based on Torrance's statement, this investigator concluded that the Originality score was more crucial than the Fluency and the Flexibility score in determining the degree of creative thinking of any person of any ethnic group. As Wing (1967) stated, "creativity knows no social,

ethnic, religious, or geographical boundaries" (p. 183); that is, it is a universal characteristic which may occur anywhere and at any age of life (Maslow, 1970; Arieti, 1976). Thus, the Vietnamese, Filipino, and the Anglo-American college undergraduate students, though born in different countries in different continents, demonstrated no statistical differences in regard to this crucial creative ability factor of Originality. However, as previously presented, the specific culture of each nation or each society also plays an important role in determining the degree of creativity of people living in that nation or that society, as demonstrated in the creative ability factors of Fluency and Flexibility. The fact that the correlation between the TCWP and the TCWW scores for all the three ethnic groups were the same for the creative ability factor of Originality, as will be discussed in a later section, is also supportive of this position.

Male students have higher Originality scores. Males had higher Originality scores than females across all the three ethnic groups tested as measured by the TCWP. However, the TCWW did not show any differences between the sexes on this sub-test. This difference between the sexes could have occurred due to chance for the same reason cited earlier when the creative ability factor of Fluency was discussed.

The difference could also be attributed to different characteristics between the sexes, however. If creativity was understood as divergent thinking, the results of Guilford's (1956) research appeared to favor males. If creativity was understood as the individual's ability to break set or restructure a given problem, especially a perceptual or visual-spatial one, there was also a tendency for males to be superior (Maccoby, 1966). The findings of this study also favored males.

The results of the verbal test, nevertheless, did not show significant differences between the sexes with regard to this creative ability factor of Originality. This fact could be explained by referring to what was found by Maccoby and Jacklin (1974). Based on the results of their research, the two authors concluded that females had more verbal ability than males. Probably because of their better verbal ability, females in all the three ethnic groups tested did not significantly differ from males in their verbal Originality responses. Their verbal ability apparently helped them overcome the male superiority in Originality as measured by the non-verbal test.

Elaboration Sub-test results

With regard to the creative ability factor of Elaboration, the TCWP showed a great difference among the three ethnic groups tested. The Anglo-American college undergraduate students had significantly higher Elaboration scores than the Filipino and Vietnamese college undergraduate students.

Though creativity has been considered as a ubiquitous characteristic of the human being (Wing, 1967), it has been also influenced by the culture in which people live (Lipset, 1962; Smith, 1966; Maslow, 1970). In addition, it is a nebulous concept as previously described and is measured by different factors, namely Fluency, Flexibility, Originality, and Elaboration. Because of the infancy of measurement of creativity,

the factor of Elaboration, up to the time this study was undertaken, was measured only by the TCWP, not by the TCWW.

Another factor was that the ex post facto design used in this study was quasi-experimental but also descriptive because of lack of control of experimental condition (Sax, 1968). Combining all these elements together, this investigator tended to say that, on one hand, it was hard to reach a cause-and-effect conclusion regarding a higher Elaboration score among the Anglo-American college undergraduate students tested in comparison with a lower Elaboration score among the Vietnamese and the Filipino college undergraduate students tested; on the other hand, probably because of its ubiquitous characteristic, creative thinking did not show a statistical difference among the three groups of students tested with regard to one of the important creative factors, the factor of Originality. However, probably because of the influences of different cultures, creative thinking showed a statistical difference among the three groups of students tested with regard to another important creative factor, the factor of Elaboration. Based on the studies of Torrance (1974b), and Torrance and Sato (1979), this investigator concluded that Elaboration was the most important factor among the four factors of creative thinking.

Torrance and Sato (1979) studied the nature of creative thinking of the Japanese on the occasion of the "recent emergence of Japan as 'Number One' in many areas of creative achievements" (p. 216). They found that the Japanese students scored significantly higher than their United States counterparts on the creative factor of Elaboration and the two authors called the Japanese "elaborators" (p. 220). It should be noted that Japanese traditional culture stresses the importance of free time and space which constitute "creativity and freedom in the framework of

Japanese culture" (Lee, 1964, p. 56). It should also be noted that "the Japanese people have eagerly and readily welcomed Western civilization since the Meiji period" (Doi, 1969, p. 339). It may be these factors that have motivated the Japanese leadership in the field of creativity.

It is clear that liberty and democracy have been emphasized since the time of the establishment of the United States in 1787. Moreover, the American culture has welcomed the thoughts presented by people such as Galton (1869) and Lombroso (1891). As early as 1941, Mearns had already presented methods of promoting creative thinking and creative teaching in the United States while the Vietnamese and Filipino social and educational systems urged their people, mostly their students, to be family-bound and content with rote-learning (Duong, B., 1975; Duong, H., 1979; Bulatao, 1965; Sechrest, 1969). As late as 1941, in Vietnam, there were "not any books recording [scientifically] Vietnamese literature and history" (Duong, 1979, p. iii).

Following the form of Torrance and Sato, it might be said that American culture has promoted the United States to "Number One" in almost every respect of creative achievement if compared with Vietnam and the Philippines. In this study, American students were able to elaborate more than the Vietnamese and the Filipino students and showed more Flexibility than the Filipinos. These differences may also be attributed to the influence of the American, Vietnamese, and Filipino cultures.

Results of Correlational Studies

As noted earlier, for the Vietnamese, Filipino, and Anglo-American college undergraduate students tested, there was no correlation between the TCWP scores and the TCWW scores with respect to the creative ability factor of Fluency and Flexibility. For all the three groups of students

tested, however, a moderate positive correlation was found in the creative ability factor of Originality.

Torrance (1974b) stated that some early clinical uses of his tests of creative thinking brought to his attention "a large proportion of cases with quite low verbal and quite high figural scores" (p. 60). Thus, Torrance accepted that discrepancies between the verbal and figural performance were evident. This study corroborated his findings except in the area of Originality. On this one sub-test there was a consistent pattern of low positive correlations. To say it in other terms, the results of the TCWP and the TCWW appeared to say that Vietnamese, Filipino, and Anglo-American college undergraduate students who showed greater amounts of Originality in response to a figural stimulus also showed greater amounts of Originality in response to a verbal stimulus.

The relationship between the TCWP scores and the TCWW scores on the creativity ability factor of Originality could be explained by repeating the earlier argument that creativity is a universal characteristic which may occur at anywhere and at any age of life (Wing, 1967; Maslow, 1970; Arieti, 1976). Creative people can be found in every culture. Because of its universalness and nebulousness, creativity may appear at different degrees with regard to one factor; it may also appear at equal degrees with regard to another factor. The moderate positive correlation between the two test scores in all the three ethnic groups with respect to this Originality variable showed that whether measured by either the figural or the verbal test, the creative ability factor of Originality did exist in every person, across all the three ethnic groups. There were no differences, however, among the ethnic groups on this creative ability

factor of Originality although males were superior to females on the figural sub-test.

Overview of Discussion

In summary, the Filipino college undergraduate students excelled above the Vietnamese college undergraduate students on the creative ability factor of Fluency probably because of their hiya system, their American-based educational system, and their fluency in English. The Anglo-American college undergraduate students excelled above the Filipino college undergraduate students on the creative ability factor of Flexibility probably because of their culture which fostered divergent thinking. For the creative ability factor of Originality, no statistical differences were found among the three ethnic groups tested probably because creativity is universal and nebulous, and the factor of Originality is a crucial variable in measuring creativity. The Anglo-American college undergraduate students excelled above the Filipino and the Vietnamese college students on the creative ability factor of Elaboration probably because the American culture was more democratic than the Vietnamese and the Filipino cultures. Females in all the three groups of students tested excelled above the males on the creative ability factor of Fluency because they paid more attention to the tester's explanations and started to work more quickly on the two tests than the males did. Males, however, excelled over females on the creative ability factor of Originality as measured by the figural test probably because of their superiority in visual-spatial ability. The moderate positive correlation between the TCWF scores and the TCWW scores in all the three groups tested with respect to the creative ability factor of Originality probably

resulted from the fact that creativity is a universal characteristic and a nebulous concept and it can be measured by both figural and verbal tests.

III. Conclusions

Based on the findings of this study, the investigator concluded that:

- the Filipino college undergraduate students scored higher on figural Fluency than the Vietnamese college undergraduate students;
- there were differences between the sexes in their responses to the creative ability factor of Fluency as measured by the figural test, with females having higher Fluency scores than males;
- the Anglo-American college undergraduate students scored higher on figural Flexibility than the Filipino college undergraduate students;
- there were differences between the sexes in their responses to the creative ability factor of Originality as measured by the figural test, with males having higher Flexibility scores than females;
- the Anglo-American college undergraduate students scored higher on figural Elaboration than either the Filipino or the Vietnamese college undergraduate students;
- male and female Vietnamese, Filipino, and Anglo-American college undergraduate students who showed greater amounts of Originality in response to a figural stimulus also showed greater amounts of Originality in response to a verbal stimulus.

IV. Recommendations

Based on the findings of this study, the investigator proposed theoretical recommendations as follows:

- additional studies should be conducted using samples of other ethnic groups such as Chinese, Laotian, Korean, and Japanese to verify findings in this study and further to examine cultural differences and the influence of specific cultural traditions;
- an in-depth study, isolating specific cultural elements in the Vietnamese, Filipino, and American cultures, should be undertaken to determine which traditions, mores, and values have the greatest influence on creativity.

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Appendices

Appendix A

Peter Chu-Quang-Minh
203 E. Washington Street,
Stockton, CA. 95202
Tel: 463-3980, or 957-8596

March 2, 1980

Dear M

I am Mr. Peter-Minh Quang Chu, a doctoral candidate of the University of the Pacific, Stockton, and an intern-counselor of the San Joaquin Delta College, Stockton, California. I am writing a dissertation regarding Creative Thinking in Male and Female Vietnamese, Filipino, and Anglo-American College Undergraduate Students, as Measured by the Torrance Tests of Creativity.

I would like to ask your cooperation in my research by taking the two Torrance tests, one is Thinking Creatively with Pictures which needs thirty minutes to complete, and another is Thinking Creatively with Words which requires forty five minutes to write. What you will do when taking the tests is to follow the test instructions and then draw or write whatever you think interesting and original, that is whatever you like.

The test-taking place will be at Delta College, and the date will be on either one of the following days: Thursday, 3/27/1980; or Friday, 3/28/1980; or any day convenient to you. Joined with this letter is an envelope with a stamp on it. I wish to ask you to answer my request by writing and sending the lower part of this letter back to me. I also wish to contact you by telephone soon.

Thank you very much for your reading of this request and I look forward to receive your answer and to contact you.

Gratefully yours

Peter Chu-Quang-Minh

I,

- () can take the tests of creativity
- () cannot take the tests of creativity
- * () on Thursday, 3/27/1980
- * () on Friday, 3/28/1980
- * () on, .../.../1980

Please mark an "X" between parentheses expressing your answer(s)

Signature:.....

Appendix B

Raw and T-Scores of Male and Female
Vietnamese College Undergraduate Students

	Number	Figural Test							
		Fluency		Flexibility		Originality		Elaboration	
		Score	T Score	Score	T Score	Score	T Score	Score	T Score
Male	1	28	70	27	85	64	95	132	64
	2	13	40	12	43	28	54	92	51
	3	15	42	13	45	26	52	113	59
	4	23	60	20	65	42	70	79	46
	5	17	47	16	53	27	53	92	51
	6	10	34	8	30	18	42	88	50
	7	20	55	18	60	33	60	102	55
	8	12	37	9	35	19	43	109	56
	9	19	53	17	55	34	61	104	55
	10	20	55	14	47	35	62	119	60
	11	11	35	9	35	11	34	54	39
	12	12	37	11	40	21	45	77	46
	13	18	50	15	50	17	41	86	48
	14	21	57	19	63	32	59	44	35
	15	9	30	7	28	19	43	28	29
Female	16	31	77	20	65	55	85	187	83
	17	15	42	11	40	24	48	92	51
	18	22	58	9	35	23	47	113	59
	19	30	75	20	65	31	57	137	66
	20	19	53	13	45	20	44	85	48
	21	12	37	8	30	14	38	79	46
	22	25	65	16	53	30	56	132	64
	23	14	42	10	37	15	39	109	56
	24	23	60	14	47	29	55	102	55
	25	29	73	19	63	27	53	129	62
	26	13	40	8	30	10	33	71	41
	27	15	42	9	35	21	45	92	51
	28	22	58	14	47	17	41	98	53
	29	27	67	17	55	30	56	87	49
	30	14	41	7	28	18	42	45	35

Appendix C

Raw and T-Scores of Male and Female
Filipino College Undergraduate Students

	Number	Figural Test							
		Fluency		Flexibility		Originality		Elaboration	
		Score	T Score	Score	T Score	Score	T Score	Score	T Score
Male	1	35	85	25	77	56	86	137	66
	2	21	57	11	40	23	47	93	51
	3	22	58	12	43	21	45	97	52
	4	30	75	19	63	39	66	119	60
	5	21	57	14	47	22	46	51	37
	6	15	42	7	28	14	38	74	45
	7	25	65	16	53	24	48	100	53
	8	19	53	8	30	17	41	89	50
	9	27	67	17	55	28	54	92	51
	10	29	73	14	47	30	56	74	45
	11	15	42	8	30	9	33	73	45
	12	19	53	10	37	15	39	60	41
	13	25	65	13	45	15	39	87	48
	14	27	67	18	60	27	53	49	38
	15	12	37	7	28	14	38	32	31
Female	16	36	87	20	65	48	76	130	64
	17	21	57	11	40	17	41	73	45
	18	30	75	10	37	16	40	76	46
	19	36	87	18	60	21	45	89	50
	20	25	65	12	43	13	36	133	64
	21	17	47	7	28	9	33	79	48
	22	33	80	14	47	24	48	58	39
	23	29	73	16	53	18	42	118	49
	24	19	53	6	25	8	31	101	53
	25	33	80	15	50	20	44	73	45
	26	35	85	17	55	20	44	92	51
	27	23	60	9	35	12	35	75	45
	28	18	50	7	28	13	36	47	36
	29	20	55	8	30	10	33	87	49
	30	31	77	12	43	13	36	60	41

Appendix D

Raw and T-Scores of Male and Female
Anglo-American College Undergraduate Students

Number	Figural Test								
	Fluency		Flexibility		Originality		Elaboration		
	Score	T Score	Score	T Score	Score	T Score	Score	T Score	
Male	1	31	77	29	90	60	90	211	90
	2	16	45	15	50	25	50	127	61
	3	17	47	15	50	24	48	130	64
	4	27	67	24	75	40	67	192	85
	5	19	53	17	55	24	48	109	56
	6	12	37	10	37	15	39	93	51
	7	23	60	21	67	30	56	159	73
	8	15	42	13	45	19	43	130	64
	9	21	57	20	65	31	57	160	74
	10	25	65	24	75	32	59	209	90
	11	12	37	11	40	10	33	88	49
	12	15	42	12	43	18	42	124	61
	13	21	57	19	63	15	39	150	70
	14	24	64	22	70	30	56	190	84
	15	12	37	11	40	17	41	61	41
Female	16	33	80	24	75	53	83	209	90
	17	17	47	14	47	22	46	125	62
	18	24	63	13	45	21	45	127	62
	19	32	78	22	70	29	55	190	84
	20	21	57	15	50	19	43	110	56
	21	13	40	9	35	12	35	91	51
	22	28	70	19	63	27	53	152	71
	23	16	45	11	40	14	38	128	63
	24	25	65	18	60	16	52	148	69
	25	32	78	21	67	24	48	167	76
	26	15	42	10	37	10	33	85	49
	27	18	50	11	40	19	43	127	62
	28	25	65	18	60	15	39	149	70
	29	30	75	19	63	26	52	160	74
	30	15	42	9	35	16	40	62	41

Appendix E

Raw and T-Scores of Male and Female
Vietnamese College Undergraduate Students

	Number	Verbal Test					
		Fluency		Flexibility		Originality	
		Score	T Score	Score	T Score	Score	T Score
Male	1	165	81	54	61	159	96
	2	158	78	69	76	127	83
	3	147	73	65	73	139	87
	4	141	71	41	49	112	76
	5	108	58	58	67	124	81
	6	102	56	37	44	97	69
	7	96	53	49	56	55	50
	8	73	44	38	45	64	54
	9	71	43	29	35	51	48
	10	68	42	29	35	49	47
	11	54	37	21	26	32	39
	12	42	32	20	25	37	42
	13	29	28	18	23	28	37
	14	21	24	19	24	9	28
	15	15	20	17	22	17	33
Female	16	172	84	59	66	148	91
	17	169	82	63	70	119	78
	18	154	76	61	69	127	83
	19	138	70	32	38	111	76
	20	119	62	43	50	114	77
	21	115	60	34	40	88	65
	22	101	55	48	55	49	47
	23	80	47	32	38	53	49
	24	73	44	33	39	50	48
	25	68	42	27	34	38	42
	26	65	41	24	30	30	38
	27	54	32	21	26	29	37
	28	37	30	19	24	24	36
	29	23	24	17	22	11	30
	30	18	22	17	22	8	27

Appendix F

Raw and T-Scores of Male and Female
Filipino College Undergraduate Students

	Number	Verbal Test					
		Fluency		Flexibility		Originality	
		Score	T Score	Score	T Score	Score	T Score
Male	1	181	87	52	59	137	86
	2	179	86	71	79	109	74
	3	161	79	63	70	115	77
	4	147	73	44	50	113	76
	5	139	70	57	65	108	74
	6	126	65	41	49	79	61
	7	103	56	47	54	38	42
	8	89	50	33	39	51	48
	9	73	44	29	35	46	46
	10	71	43	32	38	28	37
	11	68	42	24	30	31	39
	12	59	38	20	25	27	37
	13	47	34	18	23	13	31
	14	29	28	19	24	12	31
	15	20	23	17	22	10	29
Female	16	197	93	47	54	125	82
	17	189	90	63	70	108	74
	18	163	80	58	67	114	77
	19	151	75	32	38	97	69
	20	142	71	56	64	115	77
	21	139	70	34	40	62	53
	22	118	61	41	49	31	39
	23	98	54	28	34	43	44
	24	89	50	30	36	34	40
	25	83	47	28	34	28	37
	26	78	46	22	27	21	34
	27	64	40	19	24	21	34
	28	49	35	20	25	17	33
	29	37	30	14	19	14	32
	30	21	24	16	21	5	27

Appendix G

Raw and T-Scores of Male and Female
Anglo-American College Undergraduate Students

	Number	Verbal Test					
		Fluency		Flexibility		Originality	
		Score	T Score	Score	T Score	Score	T Score
Male	1	173	84	78	85	143	89
	2	168	82	86	95	118	78
	3	160	79	74	81	124	81
	4	139	70	68	76	111	76
	5	131	67	66	74	116	78
	6	117	61	57	65	87	65
	7	96	53	62	70	49	47
	8	75	45	43	50	53	49
	9	71	43	50	57	51	48
	10	63	40	39	46	39	42
	11	57	38	41	49	31	39
	12	49	35	28	34	36	41
	13	38	30	24	30	18	32
	14	25	25	21	26	12	31
	15	19	23	19	24	14	32
Female	16	186	88	60	68	131	84
	17	179	86	77	85	114	77
	18	163	80	68	76	120	79
	19	148	73	49	56	106	73
	20	137	69	60	68	113	76
	21	125	65	52	59	72	58
	22	109	58	56	64	39	42
	23	89	50	39	46	51	48
	24	83	47	42	49	43	44
	25	77	45	31	37	37	42
	26	77	45	35	41	25	36
	27	61	39	24	30	23	35
	28	49	35	21	26	19	33
	29	30	28	18	23	10	29
	30	20	23	17	22	12	31

Autobiographical Statement

Autobiographical Statement

Name: Peter Chu-Quang-Minh

Birth: April 30, 1940, at Tho-Ninh, Bac-Ninh, North Vietnam

Education: Elementary school, Tho-Ninh; Junior High school, Seminary St. Anthony, Dao-Ngan (North Vietnam); Senior High school, Thu-Duc (South Vietnam); B.A. Philosophy, Major Seminary St. Sulpice, Saigon, 1962; B.A. Theology, Major Seminary St. Joseph, Saigon, 1968; B.A. Civil Law, University of Cantho, Vietnam, 1971; M.A. Governmental Administration Law, University of Saigon, 1973; M.A. Social Sciences, University of Van-Hanh, Saigon, 1975; M.A. Psychology of Religion, University of the Pacific, Stockton, 1978; Ed. D. Educational and Counseling Psychology, University of the Pacific, Stockton, 1980.

Positions: Teacher of the Vietnamese literature, Duc-Minh High school, Thu-Duc, Vietnam, 1959-1960; Second lieutenant, psychological warfare officer in the Vietnamese Infantry Army, 1962-1964; Instructor of Philosophy and English, Seminary Cantho, Vietnam, 1968-1970; Scoutmaster and Scout chaplain in the Diocese of Cantho, 1968-1970; Principal of Phung-Su High school, Vietnam, 1970-1971; Director of Duc-Minh Boarding High school, Vietnam, 1971-1973; Principal of Thanh-Minh High school, Vietnam, 1973-1975; Chaplain of the Vietnamese Youth in Northern California, 1976- ; Vice-president of the Vietnamese religious personnels in the Western Region (including 11 states), 1976- ; Roman Catholic priest since 1968.

Publication: An-Ton-Ninh Magazine's editor, 1964-1968, Vietnam; Conseils et Souvenirs, translating from French into Vietnamese, printed in Saigon, 1968; Les Conversions du XXè siècle, translating from French into Vietnamese, printed in Saigon, 1969; Huong-Viet Bulletin's editor, 1976-1978, California; 7 articles in English, Trai Tim Duc Me Magazine, 1977-1978, U.S.A.; 28 articles in Vietnamese, Trai Tim Duc Me Magazine, 1977-1980, U.S.A.