

THE RELATIONSHIP BETWEEN BILINGUALISM AND CREATIVITY OF KOREAN AMERICANS

by

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(Under the direction of Bonnie Cramond)

ABSTRACT

Among the various non-European or White ethnic minority groups in America (e.g., African Americans, Latinos, Asian Americans, and American Indians), Asian American students have been described as the model minority whose members achieve great academic success, especially in math and science and present few problems in the classroom. Based on this stereotypical image of Asian American students, educators have thought that they do not require any special supports from the schools. This popular stereotype of Asian Americans has caused people to ignore the real multitalents of Asian American, including creativity.

Creativity can be conceptualized as a process of perceiving new relationships and new challenges through interactions between the creative individual and his or her environment, including the culture or language use. Thus, bilingualism may affect a bilingual's creativity. Because many Asian Americans are bilinguals, the emphasis on creativity may be especially pertinent for this group.

In this study, the relationship between the degree of bilingualism and creativity and gender and age effects on the relationship was investigated with 116 Korean American students at Atlanta Korean American school. Three different tests were used to measure participants' bilingualism and creativity, including the Word Association Test and Subject Self Rating for bilingualism and the Torrance Test of Creative Thinking for creativity. The scores of bilingualism measures were compared with those of creativity measures to investigate the relationship between the degree of bilingualism and creativity.

This study found that the degree of bilingualism and creativity were positively associated with each other regardless of participants' gender and ages. The positive relationship was found across genders, but age was an influential factor on neither creativity nor bilingualism. This study also found a significant relationship between the degree of bilingualism and Adaptive creative style. Finally, this study confirmed a positive relationship between the degree of bilingualism and Abstractness of Titles and Creative Strengths among six separate creative abilities on the TTCT. However, significant language group differences including monolinguals, non-balanced bilinguals, and balanced bilinguals were not found in this study.

INDEX WORDS: Creativity, Bilingualism, Degree of Bilingualism, Korean American, Model minority, Word Association Test, WAT, Subjective Self Rating, SSR, Torrance Test of Creative Thinking TTCT

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B.A., Ewha Womans University, 1993

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A Thesis Submitted to the Graduate Faculty
of The University of Georgia in Partial Fulfillment
of the
Requirements for the Degree
DOCTOR OF PHILOSOPHY

ATHENS, GEORGIA

2007

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August 2007

ACKNOWLEDGMENTS

There are so many people who have helped me take this long journey. First, I would like to acknowledge the members of my dissertation committee who have helped me through all the academic hurdles to get me to this moment in my life. Special thanks go to my advisor, Dr. Cramond, who was the perfect mentor for me, and committee members, Dr. Hébert, Dr. Grantham, and Dr. Harklau.

My family has provided support in a variety of ways. Special thanks to my husband, Joonbeom Kim, for the many hours spent editing dissertation and taking care of my son, and encouraging me along the way. To my precious son, Jinwoo, who is willing to understand his mother's busy days and make me laugh. My family's understanding has helped me survive under the stress of tough doctoral student days.

Finally, I am so grateful for my parents, and my mother-in-law and father-in-law in Korea who tolerated not having their kids next to them and never stopped supporting their kids. Each of you has played an important role in my attainment of my PhD. Thank you so much.

TABLE OF CONTENTS

	Page
Acknowledgments	iv
List of Tables	viii
CHAPTER	
1 INTRODUCTION	1
Bilingualism and Creativity	2
Bilingualism and Creative Styles	5
Bilingualism and Separate Creative abilities	7
Purpose of the Study	7
Research Questions	8
2 LITERATURE REVIEW	10
Model Minority Image of Asian Americans, the Myth	10
Bilingualism and Cognitive Abilities	13
Styles of Creativity	24
Creativity in Different Cultures	27
Gender and Age on Bilingualism and Creativity	31
3 METHOD	40
Sample	40
Instruments	41

Procedure	48
Data Analysis	49
4 RESULTS	53
Background of Participants	53
Data Screening	56
The Relationship between Bilingualism and Total Score of Creativity (Creative Index on TTCT)	59
Relationship between the Degrees of Bilingualism and the Creative Styles (Innovative Creativity and Adaptive Creativity)	65
The Relationship between the Degrees of Bilingualism and Separate Creative Abilities (Subscale Scores on TTCT)	70
5 DISCUSSIONS	77
The Relationship between Bilingualism and Total Score of Creativity (Creative Index on TTCT)	78
Relationship between the Degrees of Bilingualism and the Creative Styles (Innovative Creativity and Adaptive Creativity)	83
The Relationship between the Degrees of Bilingualism and Separate Creative Abilities (subscale Scores on TTCT)	86
Implications	89
Limitationss	91
Future study	92
REFERENCES	93

APPENDIX

A	MINOR ASSENT FORM	108
B	미성년 동의서 (KOREAN VERSION)	110
C	PARENTAL PERMISSION FORM	112
D	부모님 동의서 (KOREAN VERSION)	115
E	SUBJECTIVE SELF-RATING	118
F	SUBJECTIVE SELF-RATING (KOREAN VERSION)	120
G	BACKGROUND QUESTIONS	122
H	BACKGROUND QUESTIONS (KOREAN VERSION)	124
I	WORD ASSOCIATION TEST	126
J	WORD ASSOCIATION TEST (KOREAN VERSION)	127

LIST OF TABLES

3.1	Descriptive Statistics for Gender on Age	41
3.2	Word List of WAT	43
4.1	Descriptive Statistics background questionnaires	54
4.2	Mean for Male ($N = 39$) and Female ($N = 59$) on Background Questionnaires	55
4.3	Frequencies for Gender on Background Questionnaires	56
4.4	Mean for Bilingual Groups on Background Questionnaires	57
4.5	Frequencies for Bilingual Groups on Background Questionnaire	57
4.6	Descriptive Statistics with Skewness and Kurtosis for Response Variables . .	58
4.7	Correlations among Test Scores	60
4.8	Descriptive Statistics for Bilingual Groups and Creative Index	61
4.9	Descriptive Statistics for Bilingual Groups on the WAT	61
4.10	The Analysis of Variance for Bilingual Groups on the Creative Index	62
4.11	Pearson Correlation Between the WAT and the Creative Index by Gender . .	63
4.12	Descriptive Statistics for Gender on the Creative Index (CI)	63
4.13	Descriptive Statistics for Gender on the WAT	63
4.14	Independent Samples t-Test on the Creative Index and WAT	63
4.15	The Analysis of Covariance of Creative Index	64
4.16	Pearson Correlations between Age and Two Test Scores (Creative Index and WAT)	64
4.17	Descriptive Statistics of the Creative Styles	65

4.18	Correlation between the Bilingualism and Creative Styles	66
4.19	Descriptive Statistics of the Creative Styles for the Bilingual Groups on WAT	67
4.20	The Analysis of Variance for Bilingual Groups on the Adaptive Creativity . .	67
4.21	Descriptive Statistics for Gender on the Adaptive Creativity	68
4.22	Independent Samples t-Test on the Adaptive Creativity	68
4.23	Correlation between the Bilingualism and the Adaptive Creativity by Gender	69
4.24	The Analysis of Covariance of Adaptive Creativity	69
4.25	Correlations between Age and Two Test Scores (Adaptive Creativity and WAT)	70
4.26	Descriptive Statistics for the Subscales of TTCT	70
4.27	Correlation between the Scores of Separate Creative Abilities and	71
4.28	Descriptive Statistics of Abstractness of Titles and Creative Strengths for Bilingual Groups	72
4.29	The Analysis of Variance for Bilingual Groups on Abstractness of Titles and on Creative Strengths	73
4.30	Descriptive Statistics for Gender on Abstractness of Titles and on Creative Strengths	74
4.31	Independent Samples t-Test for Gender on Abstractness of Titles and on Cre- ative Strengths	75
4.32	Correlation between the Bilingualism and Abstractness of Titles and Creative Strengths	75
4.33	The Analysis of Covariance of Abstractness of Titles	76
4.34	Correlations between Age and Two Separate Creative Abilities	76

CHAPTER 1

INTRODUCTION

Asian American students are often portrayed as awkward nerds with eye glasses and no athletic interests who spend countless hours in the library reading math and science books (Wong & Halgin, 2006). This is the popular image of Asian American students. Xuna Nguyen, a Vietnamese, responded to this popular perception about Asian American students, saying:

I used to go into classes, and if you don't do that well in math or science, the teacher is like. "What are you? Some kind of mutant Asian? You don't do well in math..." You see, I'm not that good in math. I also find that a lot of my friends become upset if they're not good students... (Lee, 1994, p. 426).

As shown in these examples, Asian Americans have been portrayed as model minorities who attain higher academic success in math and science compared to other minority groups or even Whites. Moreover, some teachers have perceived them as well-rounded and problem-free in school and society (Pang & Cheng, 1998). Researchers (Sue & Okazaki, 1990; Hune & Chan, 1997) have explained Asian Americans' academic success with their cultural expectations or relative functionalism, meaning that when other paths to success are limited for them, education may be the only means to upward social mobility. Sue and Okazaki supported this explanation with Asian American students' academic superiority to other minority students such as Blacks or Latinos. Many school districts with high concentrations of Asian Americans tend to have the highest percentage of Asian Americans participating in

gifted and talented programs in comparison to their school enrollment (Kitano & DiJiosia, 2002)

However, this stereotype is not true for every Asian American. Asian Americans are composed of very diverse subgroups, which have very different characteristics and ways of living. For example, some groups of Asian Americans (e.g., Southeast Asian and Pacific Islander groups) are struggling under low performance in academic areas, and they often do not receive appropriate instructional assistance because of the popular, academically exaggerated model minority image (Hune & Chan 1997).

This popular stereotype of Asian Americans makes people ignore the real, multifaceted talents of Asian Americans, including creativity. Often educators don't look at Asian students' creativity and the traits most associated with it, such as being open-minded, enjoying risk-taking, having an attraction to complexity and tolerating the ambiguity that can help one navigate between two different cultures and language use (Davis, 1999; Davis & Rimm, 1998). Academic success is not the only characteristic of Asian Americans who are involved in more than one culture and use more than one language, nor is it applicable to all individuals in the group. Weinberg (1997) insisted that schools should meet the diverse needs of Asian American students, rather than seeking cultural explanations for success or failure in schools. To get a better picture, we should extend our focus from only academic success to include abilities such as creativity.

Bilingualism and Creativity

Creativity can be conceptualized as a process of perceiving new relationships and new challenges through interactions between a creative individual and his or her environment, including culture or language use (Raina, 1999). Bilinguals are those who are able to speak two languages that represent two different cultures (Bialystok, 2001; Fleith, 2002). Thus,

bilingualism may critically influence a bilingual individual's creativity. Because many Asian American are bilinguals, the emphasis on creativity may be especially pertinent for this group.

Research on bilingualism has indicated that bilingual children tend to be more creative than monolinguals (Lasagabaster, 2000). One cause of the increase in creativity may be the flexibility that is required for students to frequently switch codes and cultural behaviors from one to another (Walters, 2005). It seems logical then, that the less alike the two languages (e.g., Korean and English) and cultures (e.g., Korean and American) are, the more flexibility is required. Creativity itself is viewed as involving a personality trait such as tolerance of ambiguity, which is also viewed as important in the learning of second languages (Stern, 1983). According to Cummins (1977), bilinguals are cognitively more advanced because they have two symbols for many objects from an early age. In this way, they may conceptualize environmental features in terms of their general properties without reliance on linguistic symbols. Additionally, because language is a vehicle of culture (Fleith, 2002), the interactions of two different cultures can also contribute to their creativity. Some research suggests that creative abilities, specifically understanding and constructing a defined problem-solving strategy for an ill-defined stimulus, can be affected by the specific words used (Mumford, Reiter-Palmon., & Redmond, 1994), and the social environment in which an individual has been situated (Dacey & Lennon, 1998).

Therefore, we need to investigate Asian Americans' creativity within their complex bilingual situation, including the use of two languages and cultural interactions, with languages and cultures that are very different. However, there are some gaps which have to be considered in the previous research on the relationship between bilingualism and creativity (Raymond & Alfredo, 1992). Some studies used small samples, making generalization very

restricted or impossible. More commonly, studies fail to define or describe the level of bilingualism in their sample. There is evidence that there are some differences in creativity among students due to their levels of bilingualism (Hamers & Blanc, 2000; Holtzman, 1982).

The level of bilingualism refers to the degree of competence a student has in each language. Balanced bilinguals have approximately equal proficiency in both languages. Non-balanced bilinguals are clearly more proficient in one language than another. Monolinguals are those who really only have proficiency in one language (Bialystok, 2001). However, the issue is rather complex because there are differences in what is considered proficient, and what level of language competence affords additional cognitive benefits. Baker (1996) stated that when a child's second language competence reaches a similar level to his or her first language competence, cognitive benefits might accrue. He explained the difference between balanced and non-balanced bilinguals as threshold. Cumming (1977) further explained, "There may be a threshold level of linguistic competence, which a bilingual child must attain both in order to avoid cognitive deficits and to allow the potentially beneficial aspects of becoming bilingual to influence his cognitive growth" (p. 10). Accordingly, studies (Konaka, 1997; Perani, 2005) have shown that balanced bilinguals show superiority in creativity to non-balanced bilinguals or monolinguals. Takakuwa (2000) has supported the assertion that bilingualism may have some beneficial cognitive consequences and greater flexibility in its usage.

Yet even the definitions of bilingualism have been changed recently in recognition of the multidimensional aspects of bilingualism. Linguistic ability cannot solely explain it. There are psychological, social, and cultural issues that influence one's bilingualism (Grosjean, 1982; Halliday, 1973; Skutnabb-Kangas, 1981). Furthermore, creativity may not exist in the same form across cultures. Because individuals develop behaviors and skills supported by their surrounding environment, their creative abilities may be expressed within the context of what

is valued within their own cultural group. Thus, efforts need to be directed toward exploring children's creativity through homogenous samples that examine the relationship between the children's creative skills and their specific language and cultural backgrounds (Lopez, 2003). With this perception, I investigated the relationship between degrees of bilingualism and creativity, focusing on one homogenous group: Korean Americans.

Bilingualism and Creative Styles

Creativity is a multidimensional ability that is influenced by various factors such as a culture or a language (Gelade, 2002). Puccio, Treffinger and Talbot (1995) stated that creative people have a stylistic preference in their ways of being creative, or their creative behaviors. Researchers (Ogawa, Kuehn-Ebert, & Devito, 1991; Saeki, Fan, & Van Dusen, 2001) have studied cross-cultural differences between Asian American students and American students and found that different creative performances or preferences exist between different cultures and languages groups. For example, American students show superiority in flexibility (ability to shift categories of ideas), while Asian American students show superiority in elaboration (ability to add details to ideas) on a measure of creativity (e.g., Torrance Test of Creative Thinking) (Ogawa, Kuehn-Ebert & Devito, 1991; Saeki, Fan, & Van Dusen, 2001). They explained the different creative styles between participants as the function of different cultures.

Language represents a culture's understanding of the world and shapes thought (Lakoff & Johnson, 1980; Lubart 1999). Bilinguals are often involved in two different cultural contexts, which use two different languages, as opposed to monolinguals who are situated in essentially one cultural context and one language use. Under this circumstance, bilinguals' different languages, as an integral part of culture, may affect the ways that people creatively conceive of a problem (Lubart, 1999).

In the present study, I investigated the impact of bilingualism on creative style with Korean American participants as well the amount of creativity related to the degrees of bilingualism. The Korean American participants as bilinguals are involved in complex contexts in terms of linguistic cultural influences on creativity due to interactions between their two very distinct cultures and languages, and their bilingualism can be expected to affect their creative performance or creative styles.

Kirton (1976) proposed two different creative styles, Innovative orientation and Adaptive orientation, in which a person's positions are representative of his or her approaches to creativity, problem solving, and decision-making. Adaptors tend to produce ideas that are all linked to the problem in a consensually agreed way, while Innovators tend to generate ideas which may threaten traditional boundaries or paradigms (Isaksen & Lauer, 2003; Kirton, 1999). In the bilingual setting, students are often confronted by challenges caused by an interaction between their first language and their second language or between two different cultural contexts. Under these circumstances, bilinguals need to make decisions with a more flexible approach to the world using their dual linguistic perspective and dual cultural perception. During problem solving or decision-making, bilinguals may have a great diversity of associations connected to the same concept or great tolerance of ambiguity for incompatible, ill-defined elements.

Kim (2006b) found that the TTCT consists of two factors based on Kirton's Innovative-Adaptive theory. In her study, the subscales of the Torrance Test of Creative Thinking represented Kirton's creative styles. She found that TTCT scores can be the indicators of an individual's creative preference. Consequently, creative styles can be measured by the TTCT.

In my research setting, I expected that my participants' two cultures and two languages (Korean and American) might affect their creativity and their preference for creativity. My second research focus was on how the Korean American students' bilingualism affects their creative styles.

Bilingualism and Separate Creative abilities

Creativity is a multifaceted phenomenon, derived from the interaction of various elements, including person, process, product, and environment. Creativity can be described as a complex process of those factors (Wechsler, 2006). Culture and language use may influence one's creativity. Bilingualism carries psychosocial dimensions that can affect a speaker. The language used in a culture or a society is instrumental for delivering the concept of the culture or society (Bialystok, 2001). Thus, cultural and social circumstances of life play a critical role in how children develop both linguistic and cognitive ability. Bilingualism does not only describe someone who is proficient in two languages. Linguistic characteristics are also markers for important social categories (Bochner, 1996). Creativity can be expressed in different ways within different cultures because each culture encourages a creativity on which it places value (Wechsler, 2006). Asian American students who had two different cultures - American and Korean - might express their creativity differently from other ethnic groups, and their bilingualism might reflect their cultural tendency.

My third research focus was on how the Korean American students' bilingualism affects their separate creative abilities.

Purpose of the Study

Social and cultural issues have influenced bilingualism and creativity. The nature of the relationship between bilingualism and creativity needs to be examined through comparison within a culture at various levels of language proficiency. Additionally, creativity cannot

be defined as one general single factor (Gelade, 2002; Guilford, 1962; Torrance, 1974). Kirton (1976) distinguished two types of creativity as Innovative creativity and Adaptive creativity, and stated that creativity can exist in different forms across cultures and specific languages.

The purpose of this study was to explore the relationship between level of bilingualism and creativity with Korean American students in order to gain insight into the multifaceted talents of Asian Americans. These Asian Americans were interacting between two different language uses that reflected the different cultures. This research provided implications to support their needs in school or society. I formulated the research questions to investigate the relationship between the level of bilingualism and creativity of Korean American students.

Research Questions

1. Is there a relationship between the degree of one's bilingualism and one's creativity?
 - (a) Are there any gender differences in the relationship?
 - (b) Are there any age differences in the relationship? (Is there any developmental effect on one's creativity?)

2. Is there a relationship between bilingualism and creative styles (subscales grouped by factors)?
 - (a) Are there any gender differences in the relationship?
 - (b) Are there any age differences in the relationship? (Is there any developmental effect on one's creativity?)

3. Is there a relationship between bilingualism and separate creative abilities: Fluency, Originality, Elaboration, Abstractness of Title, Resistance to Premature Closure, and Creative Strengths?

- (a) Are there any gender differences in the relationship?
- (b) Are there any age differences in the relationship? (Is there any developmental effect on one's creativity?)

CHAPTER 2

LITERATURE REVIEW

Model Minority Image of Asian Americans, the Myth

Asian Americans are defined as those who call the United States their home and trace their ancestry to countries from the Asian Continent and subcontinent, and islands within the Pacific Rim (Hune & Chan, 1997). They are a very diverse, expansive and complex population. There is not a single way to define them. Their identity affects their status within an educational system and society, and plays an important role for data collection, research, and policymaking (Hune& Chan, 1997). Asians in America are greatly varied based on their geographic location, national origin, race, level of education, life expectations and social class background. According to Sue and Sue (1999), there are three major categories of Asians in American, including: (1) Asian Americans (Asian Indians, Chinese, Filipinos, Japanese, and Koreans), (2) Southeast Asians (Cambodians, Laotians, and Vietnamese), and (3) Pacific Islanders (Hawaiian, Guamanians, and Samoans). The demographic profile of Asian Pacific Islander Americans shows an array of more than 40 disparate cultural groups (Sandhu, 1997). However, the U.S. Census Bureau of the Census has organized all these diverse groups together under one category as Asian American.

The most distinct image of an Asian American student is a successful role model with high academic performance in school (Wong & Halgin, 2006). For example, the United States Department of Education (1999) indicated that Asian American students comprised 6.63% of students served nationally in gifted and talented programs and 3.98 % of total

enrollment. Asian American students have also excelled and are well-represented in the top universities, including Harvard (10 %), Berkeley (22 %), and MIT (19 %) (Sandhu, 1997). These numbers are impressive, considering that Asian Americans represent only 2.93 % of the U.S. total population.

However, the model minority image of Asian Americans was not created by Asian Americans themselves. It is a perspective that comes from the outside (Kashima, 1980; Weinberg, 1997). Since the 1960s, the popular press and mass media have portrayed Asian American students and their families to be successful minorities who have achieved upward social mobility in various contexts through their diligence and determination in business and in schools. The image of the model minority of Asian Americans is a radical departure from previous negative images. The image of Asian Americans was emphasized when the U.S. was facing a major crisis in race relations. Several researchers (Uyematsu, 1971; Wake, 1980) pointed out that many Asian American social activists promoted Asian Americans as the model minority to discredit the protests and demands for social justice of other minority groups.

Asian American students are often called whiz kids who have limited academic interests and choices focusing primarily on mathematics, sciences, and engineering with a lack of communication skills, athletic interest, and leadership, which reinforces the popular stereotype of the population. The image also over-emphasizes Asian Americans' academic success regardless of their barriers, including lack of English competence or cultural differences. With this oversimplified image of Asian American students, Asian American students who do not fit this image of the model minority seldom receive attention in the school system or in society (Hune & Chan, 1997). Consequently, many Asian American high school and college students have internalized the image and believed that they must fit the image and do better

in school than other students, specifically, in mathematics and science. If they fail to fit the image, they will try to hide their problems. Moreover, some teachers in school systems have the perception that Asian American students are well rounded and perfect children in their classes. Unfortunately, these teachers may not pay attention to their Asian American students because they are perceived to be well behaved and do not question authority (Pang & Cheng, 1998).

The different levels of academic achievement exist among the different Asian groups. Asian Americans are a very diverse group. No single image of Asian Americans can represent all of the students in different subgroups. While a selected group of Asian Americans may fit the model minority profile and be benefactors of the stereotypes, a large number of the Asian American gifted population do not. For example, the recent data has shown that some Southeast Asian (Vietnamese, Cambodian, Hmong, and Laotian Americans) and Pacific Islander groups (Hawaiians, Samoans, Guamanians) are struggling under educational risk. They are seriously underrepresented throughout higher education, while the rate of college graduation or more of Asian Americans is nearly twice higher than that for the general U.S. population (Kitano & DiJiosia, 2002). The high rate of higher education masks differences by gender and subgroups.

As we discussed above, the stereotypical model minority image of Asian Americans does not represent a real picture of Asian Americans. Weinberg (1997) insisted that schools should meet the diverse needs of Asian American students, rather than seeking cultural explanations for academic success or failure. He stated that schools have not appropriately served Asian American students and that the low academic achievements of some Asian American students are a result of inadequate programs for language minorities.

In summary, the model minority image of Asian Americans is not applicable to all individuals in the Asian American groups. Moreover, schooling based on the image of Asian Americans may fail to meet the various needs of a diverse group of students. To get a better picture of students' strengths and weaknesses, we should extend our focus from just academic success, especially in mathematics and science, to include other cognitive abilities, such as creativity.

Bilingualism and Cognitive Abilities

Bilingualism has generally been considered as a sub-field of various areas including linguistics, cognitive psychology, applied linguistics and education (Brutt-Griffler & Varghese, 2004). The majority of recent research studies show that bilinguals do not use language in the same way monolinguals do because verbal ability for one language can be transferred to another language (Andreou & Karapetsas, 2004). Apparently, bilinguals use their two different languages as a unitary linguistic capacity (Cook, 1992; Kecsker & Papp, 2002).

How does bilingualism, the ability of an individual to communicate in two languages, affect mental functioning? The interaction between bilingualism and cognitive processing has been studied and debated for several years (Nanez, Padilla, & Maez, 1992). A majority of the studies conducted during the last 15 years reported the advantage of bilinguals in various cognitive abilities, including intelligence (Colon-Papazoglou, 1999; Craik & Bialystok, 2005; Mendonca, 2004; O'Hora, Pelaez, & Barnes-Holmes, 2005) and creativity (Hoh, 2005; Lasagabaster, 2000; Lopez, 2003; Ricciardelli, 1992). Researchers have mainly focused on these major abilities when investigating the relationship between bilingualism and cognitive abilities.

Bilingualism and Intelligence (I.Q)

A widely accepted belief in the 1960s was that bilingualism had negative effects on an individual's cognitive abilities as measured by I.Q. This belief has been severely criticized in terms of lack of methodological reliability of the studies that investigated this topic. Most of the criticism involved controlling some important variables, including selection of bilinguals, or validity of measurement (Lasagabaster, 2000). For example, according to (Murphy, 1990), although a group of bilingual subjects had significantly lower scores than monolingual subjects on the Wechsler Intelligence Scale, there was no significant difference on another measure of intelligence using a more culturally fair test, the Raven's Coloured Progressive Matrices. He pointed out that an inappropriate instrument was used for comparing bilinguals and monolinguals.

The efforts of research to determine the connections between bilingualism and cognitive abilities have been frustrated by the confusion over the meaning of the substantive terms (Bialystok, 2001). First, there are controversies in the definition of bilingualism. Children become bilingual for different reasons including immigration, education, extended family, or temporary residence. The children might be situated in different contexts associated with different social classes, educational opportunities, and home language environments (Bialystok, 2001). Each one of these factors can significantly influence cognitive and intellectual development. The unclear use of a definition of bilingualism can often lead to contradictory outcomes of research in this area. Second, the widely accepted assumption about intelligence is that it is defined by the intelligence quotient (I.Q). According to this assumption, intelligence is an individual attribute that can be measured as a single quantity. However, more recent views of intelligence reflect its multidimensionality (Gardner, 2004; Sternberg, 2005). As a result of these confusions in defining two major terms, it is not clear whether

the observed difference between bilinguals and monolinguals on intelligence tests may be attributed to either their level of intelligence or degrees of bilingualism.

Peal & Lambert's (1962) research was a major turning point in the understanding of the relationship between bilingualism and individual cognitive ability using I.Q. They found that the bilingual group scored higher than the monolingual group on measures of both verbal and nonverbal intelligence. With these results they provided evidence that there is the possibility that bilingualism leads to more cognitively positive effects compared to monolingualism. More recent research on bilingualism has indicated that bilinguals are cognitively superior to monolinguals (Craik & Bialystok, 2005; Mendonca, 2004; Murphy, 1990; O'Hara, et al., 2005; Tapia, 2001). Their findings contradicted the results of previous research that bilingualism had detrimental effects on children's cognitive development. Two studies reported bilingualism had no detrimental effect on intelligence as measured by I.Q. Murphy (1990) investigated the impact of bilingualism on intelligence with Spanish-English bilingual and English monolingual subjects. He compared outcomes from two intelligence measures, the Wechsler Intelligence Scale and Raven's Colored Progressive Matrices. The findings showed that although monolingual subjects outperformed bilinguals on the Wechsler Intelligence Scale, no significant differences on the Raven's Colored Progressive Matrices were found. This study confirmed that bilingualism has no detrimental effects on cognitive abilities after controlling the cultural and language proficiency variables.

Similarly, (Mendonca, 2004 ; O'Hara, Pelaez, & Barnes-Holmes, 2005)) conducted a study that supported previous findings that bilingualism does not hinder intelligence development. They examined the effect of bilingualism on verbal intelligence with 24 monolingual and 46 bilingual college students on the WAIS-III. They reported that no significant differences in performance of two groups were found in vocabulary, arithmetic, and digit-symbol

encoding subtests of the WAIS-III. These findings showed no evidence that bilingualism deterred intellectual development. According to the previous studies, we can conclude that if bilingualism has no positive impacts on intelligence, at least bilingualism has no negative impact.

In a slightly more in-depth study, Colon-Papazoglou (1999) investigated the relationship of several independent variables including bilingualism (primarily monolingual, marginal bilingual, balanced bilingual), the language of I.Q test administration, and maternal acculturation to the I. Q test performance of bilinguals. The participants were first through fourth grade Puerto Rican-American children from low socioeconomic backgrounds. The WISC-R subject scores were used as the I.Q. measurement. He reported that the language of the I.Q. test administration positively affected test performance, and the participants consistently outperformed monolinguals with the bilingual administration of the WISC-R. Additionally, bilinguals significantly outperformed their monolingual peers on the Arithmetic subtest of the WISC-R.

Konaka (1997a) also conducted a study that provided evidence of a positive relationship between intelligence and bilingualism. He explored the relationship of the degrees of bilingualism and intelligence with seventh grade Japanese-English speaking students. The subjects' intelligence was assessed by the Raven's Standard Progressive Matrices. Interestingly, Konaka found a significant relationship between intelligence and degrees of bilingualism. In both the Japanese and English dominant groups, the measure of intelligence significantly predicted the degrees of bilingualism. This study used matched samples from high, middle, or low socioeconomic status and Raven's Colored Progressive Matrices (a non-verbal test) for measuring intelligence, in order to control for cultural fairness or language

proficiency. The findings supported the previous studies in that the bilingual students outperform monolingual students on an intelligence test.

However, these studies had some important weaknesses. First of all, the methodological controls have only ensured that the bilinguals and monolinguals were matched on variables such as socio-economic status, gender and age. Sampling with these criteria failed to control important variables such as the individual's family background, student's motivation, and parental attitude, which might influence the participants' cognitive abilities (Carey; 1991). Second, these studies measured the effect of bilingualism on cognitive abilities by measuring intelligence with I.Q. tests. However, intelligence itself is a questionable construct (Gardner, 1996; Takakuwa, 2000). There are a variety of ways in which intelligence can be understood. For example, Gardner (1996) proposed a different definition of intelligence through his theory of multiple intelligences, when he stated, "Intelligence is not a unitary entity but rather a collection of eight distinct intelligences" (p. 23). According to this view, people can be intelligent in a variety of ways. Consequently, how intelligence can be defined and measured is still controversial (Csikszentmihalyi, 1996).

Bilingualism and Creativity

Ruan (2004) stated that bilinguals should have a great deal of linguistic flexibility to monitor their language production appropriately in different contexts. Concerning the relationship between bilingualism and creativity, most studies proposed that bilingualism fostered creativity regardless of the degree of bilingualism (Baker, 2001; Lasagabaster, 2000). These studies can be split into two groups: (a) Those studies that compared bilingual and monolingual subjects and in which bilinguals outperformed monolinguals and (b) Those studies that compared bilinguals' creativity depending on their degrees of bilingualism and in which balanced bilinguals outperformed non-balanced bilinguals. In this section, I dis-

cuss the relationship between bilingualism and creativity in two different research settings: comparing monolingual and bilingual subjects, comparing the degrees of bilingualism, and discussing how bilingualism positively affects creative ability. This section covers the relationship between bilingualism and creativity, the relationship between the level of bilingualism and creativity, and an explanation of how one's bilingualism contributes to enhance his/her creativity.

Monolinguals vs. Bilinguals.

Hamers and Blanc (2000) defined monolinguals as individuals who have no or only incidental knowledge of one language while balanced bilinguals are individuals who have become highly competent in both languages.

Doyle, Champagne, and Segalovits (1978) support balanced bilinguals' superiority in creative ability to monolinguals. They analyzed a group of bilingual subjects (French/English) and a group of monolingual subjects (English). Each of the participants, who were about five years of age, were asked to tell a story. They counted the number of ideas in the stories as the index of creativity. The results showed that bilinguals were better at this task. Kessler and Quinn (1987) also studied the relationship between bilingualism and creativity by examining a group of bilingual (Spanish-English) and a group of monolingual (English) students in sixth grade. These subjects had to complete a science test in which the generated hypotheses were scored depending on their quality, their syntactic complexity, and the number of metaphors used. Bilinguals significantly outperformed monolinguals. There are several more studies in which bilinguals have obtained higher scores in creativity than monolinguals in at least one of the tasks involved (Carringer 1974; Koulos, 1986; Okoh, 1980; Wang 1982). However, there are some limitations of these studies in that they

did not employ important personal background information, including age, gender, and socioeconomic status.

Several studies were done on pairs in which at least one of the bilingual's languages was not Indo-European. In Okoh's study (1980), the bilingual subjects were speakers of Yoruba (a non Indo-European language) and English. Similarly, Wang (1982) conducted a study with bilingual speakers of Chinese and English. The results of these studies suggest that not only do bilinguals in two Indo-European languages have advantages in regard to creativity, but also those speakers of a non-Indo-European language have a similar advantage. It seems possible that the typological relatedness of the bilingual participants' two languages did not play a role of importance concerning creativity. Torrance, Gowan, and Wu, (1970) also supported balanced bilinguals' superiority in creative ability to monolinguals. A total of 1,603 bilingual and monolingual Chinese and Malayan children in the third, fourth, and fifth grades of Singapore schools were tested with Figural Form A of the Torrance Test of Creative Thinking. They found that the bilingual students excelled over the monolinguals on originality and elaboration. Their findings stated that tension resulting from the competition of new and old associations facilitated originality of thinking and played an important role in scientific and artistic achievements. However, there was some discrepancy between their assertion that bilingual subjects would be superior on all subtests of TTCT and the finding that their bilingual subjects outperformed only on originality and elaboration, although they got higher creative scores than monolinguals. It should be considered that the linguistic competence of the bilingual subjects in their two languages was not controlled, so these results should be treated cautiously. Additionally, these studies did not consider important variables such as gender and socioeconomic status, and they did not adequately measure the

degrees of bilingualism of their subjects. The most serious problem was that they did not consider various levels of bilingualism among their subjects.

Despite some flaws in research, these groups of studies have been conducted for several years and have provided clear evidence of the advantages of bilingualism on creativity. Currently, many researchers have found that various levels of language proficiency of bilinguals affect their cognitive abilities (Carlisle, Beeman, Davis, & Spharim, 1999; Perani, 2005; Rafael, Diaz, Klinger, & Bialystok, 1991). Therefore, recently researchers have been focusing on examining the impact of the degrees of bilingualism on creativity with a new perception of creativity. In this section, I discuss the association between bilingualism and creativity including extended research interests in this area.

Monolinguals vs. Non-balanced Bilinguals vs. Balanced Bilinguals.

Hamers and Blanc (2000) defined that non-balanced bilinguals were individuals who had attained a high level of competence in only one of their two languages. There were several studies that concerned participants' level of bilingualism and how their degrees of bilingualism could affect their creativity.

Alioti and Wu (1985) compared balanced bilinguals in Chinese/English with non-balanced bilinguals in Chinese/English. The participants, who were enrolled in grades 3, 4, and 5, completed the figural form of the Torrance Test of Creative Thinking. The result indicated that the non-balanced bilinguals in all grades performed significantly better in fluency and those in grades 3 and 4 performed better in flexibility. Balanced bilinguals achieved better scores in flexibility in grade 5 and in elaboration in grade 4. Therefore, the non-balanced bilinguals' superiority was less obvious. Holtzman (1980) conducted a study using a group of students aged 9 to 12 and found that the participants' degrees of bilingualism positively took into account their creativity. Alvarez (1984), with a sample of students between 5 and

10 years of age, observed that the balanced bilinguals were superior to the non-balanced ones on their creativity. The result of both studies showed superiority in favor of the balanced bilinguals in creative abilities. Ricciardelli (1992) also divided her bilingual sample into balanced and non-balanced bilinguals and stated that the former outscore the latter.

The recent research has been focused on the new directions of creativity such as problem-solving models, creativity training programs, or studies of gender differences (Fleith, Renzulli, & Westberg, 2002). Konaka (1997) investigated the relationship between degrees of bilingualism and gender to divergent thinking ability (creativity) among native Japanese speaking 6th and 7th grade students in the New York area. Konaka found that the degrees of bilingualism had a substantial effect on divergent thinking abilities. Japanese-English balanced bilinguals outperformed other groups (non-balanced bilinguals and monolinguals) in the most subtests of the creativity test (Torrance Test of Creative Thinking) including fluency, flexibility, elaboration, and originality for both the verbal and figural forms. A gender difference in divergent thinking ability was not found for balanced bilingual students in this study.

Spanakos (2002) studied the effect of bilingualism on the creative process through a problem-solving model with Russian-English subjects. The author selected 200 7th and 8th grade students from an urban public intermediate school. The Analysis of Variance revealed no significant differences between bilingual and monolingual groups on measures of divergent thinking based on responses of the Hypothesis Generating Test with three criteria including fluency, flexibility, and originality. However, bilingual participants outscored monolingual participants on a measure of convergent thinking, the Hypothesis Generating Test, on the two criteria "any correct answer" and "best answer." This study had some limitations that may explain the different results from previous studies that supported a positive association

between the degrees of bilingualism and divergent thinking ability. First, Russian-English bilingual participants in this study have limited exposure to their native language and culture. Although all the bilingual participants were born in Russia, they had spent on average almost 8 years in the United State without sufficient chances to be exposed to both cultures simultaneously. The level of proficiency across both languages (Russian and English) might have been another factor affecting the results. The bilingual participants were not equally proficient between domains of Russian and English. Finally, the limitation of the measure (Hypothesis Generating Test) might have led to different results from the previous study. The participants were all highly verbal and gifted students. Their strong verbal skills might have prevented them from showing real differences on a verbally loaded divergent task in comparison to a less verbally loaded convergent task. Under this circumstance, any bilingual advantages may have been masked by the low ceiling effect of the measure.

Additionally, Fleith, Renzulli, & Westberg, (2002) studied the effect of a creativity training program on divergent thinking ability and self-concept with monolingual students and bilingual students. They investigated a sample of 8 monolingual and 6 bilingual Portuguese-English classrooms from one school in New England using a mixed methods design (i.e. both qualitative and quantitative methods). The findings indicated that the creativity training program slightly improved divergent thinking ability in the treatment group that had been situated in bilingual classrooms.

In another study, Lasagabaster (2000) supported bilinguals' superiority to monolinguals in creativity but questioned the effect of the degrees of bilingualism on creativity. He analyzed the effect of different degrees of bilingualism on the development of linguistic creativity with 5th and 8th grade students in three different bilingual models in Basque by matching I.Q., sex, SES, and age. Model A was a monolingual model with Spanish as the

only language used. Model B was a non-balanced bilingual model in which the students had Spanish as their first language and Basque was partially used during instruction. Model C was a balanced-bilingual model. Basque and Spanish were both used throughout all of the instruction and the students had high competence in both languages. The results showed that although bilinguals were superior to monolingual peers in creative thinking ability measured with the Torrance Test of Creativity Thinking (TTCT), no differences were found between non-balanced bilinguals and balanced bilinguals in the same measure. However, this study had a limitation. The degrees of bilingualism of participants was defined based on the involvement in the different immersion models. The models may have been balanced and unbalanced, but that did not address the students' abilities. In other words, a balanced bilingual student may have been placed in an unbalanced model class. Not all language learning occurs in school.

Inconsistency was found among these researchers involving the overall relationship between bilingualism and creativity and the relationship between degrees of bilingualism and creativity. The complexity of the concept of bilingualism can explain the disagreement among these studies (Hamers & Blanc, 2000; Simonton, in press-b). Bilingualism can be defined differently depending on how it is conceptualized. Bilinguals can differ in how they learned their two languages: whether they learned two languages simultaneously in a natural setting, or they learned them intentionally in an educational setting. Furthermore, the nature of the language proficiency would be different between the two languages. Bilinguals may not necessarily be fluent in the second language in the same way that they are fluent in their first language. Bilinguals cannot be fluent in both languages in the same manner (Simonton in press-b). For example, a child may have greater fluency in the language of instruction on

academic matters and greater fluency in the home language on everyday life matters. Such a student could be equally facile in two languages, but not on the same topics.

Although inconsistency existed in the research, the majority of studies suggested that bilinguals tended to be more creative than monolinguals, and they were generally superior in other areas such as intelligence, metalinguistic awareness, and concept formation (Ricciardelli, 1992).

Styles of Creativity

Creativity is a multidimensional ability, which is influenced by various factors from certain social environments such as culture or language (Gelade, 2002). Puccio, Treffinger, and Talbot (1995) stated that creative people have a stylistic preference in their ways of being creative or their creative behaviors. Researchers (Ogawa, Kuehn-Ebert, & Devito, 1991; Saeki, Fan & Van Dusen, 2001) studied cross cultural differences between Asian students and American students. They found that different creative performances or preferences existed between different cultures and languages groups. For example, American students showed superiority in flexibility, while Japanese students showed superiority in elaboration on the Torrance Test of Creative Thinking (Ogawa, Kuehn-Ebert, Devito, 1991; Saeki, Fan & Van Dusen). They explained the different creative styles between participants as a function of different cultures. Lubart (1999) stated that there is a different perception of creativity between the Eastern and the Western cultures. According to him, in the Eastern view, creativity seemed to involve finding a new point of view to reinterpret traditional ideas, while creativity from the Western perspective involved a break with tradition.

Shallcross and Li (1992) supported the assertion that creativity was reflected by cultural perception. They investigated different patterns of solving the Nine-dot problem with 20 Chinese and 20 American college students. They found that American students spent

more time going through trial-and-error before arriving at a solution, while Chinese students spent more time selecting the problem and solution. They interpreted the cultural differences in problem-solving approach with the Nine-dot problem as a reflection of the Chinese saying "Think three times before doing."

Language represents a culture's understanding of the world and shapes thought (Lubart 1999; Lakoff & Johnson, 1980). Bilinguals are often involved in two different cultural contexts, which use two different languages, as opposed to monolinguals, who are situated in essentially one cultural and language context. Under this circumstance, different cultural atmospheres and languages as an integral part of culture may affect the ways that people can creatively conceive a problem (Lubart, 1999).

Kirton (1999) proposed cognitive preferred styles with which the individual undertakes problem solving and creativity. He defined creativity as a continuum of styles ranging from adaptive preferences for decision making and problem solving to Innovative preferences (Isaksn & Lauer, 2003; Puccio, Treffinger, & Talbot, 1995). In his view, individuals may have a tendency to have relative preferences for one or the other approach to solving problems independent of their creative ability (Goldsmith, 1985). Kirton, (1999) stated that all people produce original ideas in different ways. According to Kirton, the primary difference between adaptors and innovators is their approach to change. While adaptors are those who try to do their best to do things better, innovators are those who wish to do things differently. Innovators tend to incorporate the context of a problem into the problem itself and seek to change the patterns as a part of their solution (Goldsmith, 1985). Adaptors create original ideas, which are more likely to fit the existing paradigm, but innovators prefer to create original ideas which are more likely to challenge the existing paradigm (Kirton, 1999). Adaptors tend to produce ideas that are all linked to the problem in a consensually agreed

way, while innovators tend to generate ideas which may threaten traditional boundaries or paradigms (Kirton, 1999; Isaksen & Lauer, 2003).

There are distinctions between adaptors and innovators in their ways of being creative. Innovators generate more original ideas spontaneously and perform tasks or solve problems immediately, paying less attention to detail and thoroughness. On the other hand, adaptors generate original ideas precisely, thoroughly, and in detail, and they define the problem more carefully and specifically. Adaptors also show preferences for working within a boundary of established rules or a system, and focus on conformity or consensus (Isaksen & Lauer, 2003).

These two different creativity preferences show different result patterns in measuring creativity. Several researchers found that innovators were more fluent, more original, more drawn to risk taking, and more creatively motivated (Goldsmith, 1985; Scott G. Isaksen & Puccio, 1988; Puccio, Treffinger, & Talbot, 1995). Kim (2006b) supported these patterns through analyzing the Torrance Tests of Creative Thinking (TTCT) for latent structures of creative thinking ability. She found that creative thinking ability, measured by the TTCT, consisted of two factors, which corresponded to Kirton's Innovative and Adaptive styles. Innovative factors were associated with the TTCT scores on Fluency and Originality, while Adaptive factors correspond to the TTCT scores on Elaboration and Abstractness of Titles. She excluded Creative Strengths in her final model because the model without Creative Strengths were better fit (note from Laurie: need to explain better fit here) than that of with it, although initially it was categorized as Adaptive style. She also stated the different scoring procedure of Creative Strengths from other subscales of TTCT. Kim's findings supported Torrance and the findings of other researchers (Isaken & Puccio, 1988; Torrance & Horng, 1980) that innovators were more likely to be fluent and original. She also provided an explanation about the double loading of Resistance to Premature Closure based on Torrance's

(1998) theoretical assumption that psychological openness is a prerequisite for creativity in general.

Creativity in Different Cultures

Csikszentmihalyi (1999) stated that creativity should be considered more as a cultural and social phenomenon than merely as a mental process. Torrance & Sisk (1997) believed that what is honored in a culture will be cultivated there. Culture can have an effect both on levels of creativity and on how creativity is evaluated. Thus, creativity can take various shapes and forms across cultures (Ng, 2003). Lubart & Sternberg (1998) proposed that the effects of culture on creativity can be manifested in many ways, including the concept of creativity, the creative process, the direction of creativity toward certain domains of activity or certain social groups, and the extent to which creativity is nurtured. Under this cultural perspective on creativity, one's creativity can be expressed in different ways in different cultures.

Niu & Sternberg (2001) studied cultural influences on artistic creativity and its evaluation with Chinese and American college students. They examined the differences in artistic creativity between college students from different cultures and the differences in criteria used by Chinese and American judges to evaluate the students' works. They reported that there were strong tendencies for the two different cultural groups of college students to express their artistic creativity in different ways. For example, the Chinese students tended to make simpler and more stereotypical artwork than the American students. In other words, Chinese students may have more difficulty in breaking through a task limitation that is relatively restrictive in nature. The other aspect of difference between the American and Chinese college students was found in the technical quality of their works. The Chinese students' art products showed a lower technical quality than those of the American students. Chinese drawings

appeared less effort-intensive and more like sketches, whereas American drawings were more detailed. Chinese students performed worse than their American counterparts on artistic creativity and aesthetic qualities. Researchers suggested that broader social factors, including conditions of society, might influence people's creativity in different domains (Kavolis, 1964; Simonton, 1997). They also examined the effect of culture on people's artistic creativity in different contexts. They found that Chinese students were more likely to be influenced by constraints from task characteristics or from the instructions given to them than their American peers. American participants showed more ease and spontaneity in breaking through the constraints and expressing their artistic creativity in diverse ways. The differences between these two different cultural groups suggested that the environment has potentially important effects on people's artistic creativity (Niu & Sternberg, 2001).

When comparing Americans to members of other cultures, Americans were more likely to show higher tendencies on many characteristics of creativity, including openness to experience, autonomy, nonconformity, self-confidence, self-acceptance, and so on (Zha, Walczyk, Griffith-Ross, Tobacyk, & Walczyk, 2006). Markus and Kitayama (1991) proposed different perceptions of creativity between Western and Eastern people. They stated that people of Western cultures tended to be independent and to find meaning to their own internal thoughts, feelings, and actions rather than refer to the thoughts, feelings, and actions of others. People from Eastern cultures, including Chinese, Indians, or Japanese, were more likely to hold an interdependent perception of the self in which meaning depends more on interpersonal relationships.

The individualism or collectivism in Eastern cultures might influence their members' ways of expressing creativity, but not their amount of creativity. For example, there are inconsistencies across studies on performance of creativity between different cultural groups.

Jellen and Uurban (1989) reported that children in Western cultures (such as America, England, and Germany) significantly outperformed children of the East (in countries such as China, India, and Indonesia) on the Test for Creative Thinking-Drawing Production. However, other research reported contrasting results. Rudowics, Lok and Kitto (1995) found that Chinese children from Hong Kong gained significantly higher creative potential scores on the TTCT figural form than American children. Pornrungrroj (1992) also found that Eastern students outperformed Western students on creativity. In his study, he found that Thai children born in Thailand achieved significantly higher scores than did the Thai American students on the creative potential portion of the TTCT.

Although the researchers did not find differences in the amount of creativity across cultures, they found some different patterns in the ways of expressing creativity across cultures. As discussed above, cultural factors, including educational experience, family expectancy, and sociocultural forces, may affect the development of creativity. The people receiving their education within one culture would develop different components of creativity from people in other cultures (Saeki, Fan, & Van Dusen, 2001). For example, Asian countries have very different cultures and educational environments as compared to the United States. Asian culture values conformity or collectivism, whereas American culture values independence or individualism. Saeki et al (2001). investigated cross-cultural differences in creative thinking with 51 American and 54 Japanese college students. They found some cultural differences in the Elaboration and Abstractness of Titles of the TTCT. American students performed better on Elaboration than the Japanese students. They also outperformed Japanese students on Abstractness of Titles. The researchers explained these differences in participants' creativity as the effect of different cultural influences. As previously discussed, Japanese culture emphasizes conformity rather than individualism. Therefore, Japanese students might have

less experience expressing their own ideas than their American counterparts. The researchers stated that Japanese students tended to use generic titles rather than abstract or descriptive titles. Ogawa, Huehn-Ebert, & DeVito (1991) also compared fifth-grade Japanese and American children on flexibility and fluency. Although they could not find cultural differences in performance of fluency between groups, they found that American children outperform Japanese children in flexibility.

Some studies showed different patterns of creativity among different cultural groups, with Asian participants' superior to their Western counterparts in creativity. Torrance and Sato (1979) found that Japanese students tend to do better than American students on the flexibility, originality, and elaboration on the figure form of the TTCT. Zha (1990) also reported cultural differences in divergent thinking ability. In her study, Chinese children performed better than did their German counterparts on divergent-thinking tests that required the application of knowledge of mathematics and physics. German students performed better than the Chinese students on items that required practical knowledge. Zha stated that Chinese education places more emphasis on mathematics and the natural than on required practical social skills.

As discussed above, there were some inconsistencies among research findings in terms of the amount of creativity among different cultures, especially between Eastern and Western groups. However, the clear difference that was found in many studies was that people in a culture express their creativity differently from those in other cultures. People receiving their education within one culture would develop different components of creativity than people in other cultures (Saeki, Fan, & Van Dusen, 2001).

Several studies investigated gender effects on creativity across cultures (Kim & Michael, 1995; Richardson, 1986; Runco, 1990). Runco found no gender differences on cre-

ativity with 107 American children in grades 4-6. However, gender differences were found in other cultures. Kim and Michael (1995) reported gender differences on verbal and creativity tests. They found that high school females outperformed their male counterparts on verbal and visual creativity.

Gender and Age on Bilingualism and Creativity

Gender and Bilingualism

The recent research that focused on language and gender has rejected categorical and fixed notions of social identities. The linguistic constitution of gender varied across different linguistic practices (Eckert & McConnell-Ginet, 1992; Ehrlich, 1997). The recent research has shifted questions from understanding how gender shapes language use to understanding how and when language use constructs gender difference as a social category. Current trends in language and gender research affect the field of bilingual education.

Many early investigations of gender and bilingualism reported the superiority of female learners. Ekstrand (1980) conducted two large-scale studies to investigate gender difference on the bilingualism with Swedish children learning English and immigrant children learning Swedish. Ekstrand found that girls showed higher level of proficiency in the two cases. He explained the differences based on cognitive variables, brain function, and cultural differences. Boyle (1987) supported female superiority of general language proficiency with 500 Chinese university students studying English in Hong Kong.

However Ellis (1994) pointed out that female superiority in bilingualism was disputable. The motivation and incentive for being bilingual may differ in women and men, depending on the types of opportunities that a second language creates and makes available to them. Holmen & Jorgensen (2000) found gender differences in the code-choice patterns of the Turkish-Danish bilingual students in their study. Although girls in girls-only groups

hardly used Danish at all until grade 7, Danish dominated the conversations in the girls' groups in grade 7. However, Girls in the mixed gender group used as much Danish as the boys in early grades. Thus, when the girls were in the company of boys, they did as the boys did. A number of studies investigated several issues in terms of gender-related difference on bilingualism including indications of unequal distributions of power and indications of girls' superiority in flexible language use.

Jacobsen (2002) studied a girl's development of code switching from grade 1 through grade 9. She found that code switching was not a power tool, but a range of strategies. Quist (1998) had drawn a sociogram of bilingual students' social networks, including their monolingual peers. It showed that the gender differences were more pronounced than the ethnic differences. For the females, the ethnic distinctions seemed to matter more than for the boys. According to Jorgensen (2003), the bilingual girls were grouped into small groups in an exclusive network with only a few connections to the monolingual girls' small groups, while bilingual boys were not grouped, but were scattered in an inclusive boys network. The bilingual girls differed much more in skills than the boys did, with both the highest and the lowest achievers among the girls.

However, some research has been connected to a deficit framework in bilingual women (Pavlenko, 2001; Pavlenko & Piller, 2001). For example, women have been posed as less bilingual than men and also more connected to the minority language. In many language contexts, the dominant language, perceived as the power code, is associated with masculinity, and the minority language with femininity and domestic values (Pavlenko, 2001). This indicated that gender and languages interact in ways that make bilingualism have different meanings to different groups. For example, in some communities, women may be given less access to a second prestigious language, restricting their bilingualism. However, the opposite can also

occur (Baker, 2006). The gender differences on bilingualism are still controversial among researchers.

Age and Bilingualism

Age has been considered a major factor in language development that determines success in second language learning (Marinova-Todd, Marshall, & Snow, 2000; Singleton, 2003). Early research proposed that the lower the age at which a second language is learned, the greater will be the long-term proficiency in that language. Young children learn a new language more easily and successfully with less effort than older learners (Bley-Vroman, 1989; Schachter, 1989). The critical period for second language acquisition has been focused on the bilingualism area. This view of a critical period for being bilingual is based on the belief that children are biologically better prepared to learn second languages than adults. However, there is a lack of consensus in findings among studies that used different methodologies, engaged different subject groups, and assessed different linguistic features. Some studies reported that the native-like proficiency was attainable irrespective of the age at which acquisition began (Birdsong, 1992; Bongaerts, Planken, & Schils, 1995).

According to Newport (1991), there were three types of evidence to support the critical period for second language acquisition. First, there should be a discontinuity in overall achievement that separates learners within the critical period from those outside it. Second, there should be an asymmetry in the effects of the first language on the acquisition of the second. Learners inside the critical period should be equally prepared to acquire structures that differ between the two languages and those that correspond. Finally, learners inside the critical period should produce the same pattern of results as native speakers in response to testing conditions such as presentation modality. However, Bialystok and Miller (1999) rejected the evidence of the critical period for second language learning. They

investigated a critical period in bilingualism with two learner groups that were divided into those who had begun learning English at a younger age (less than 15 years) and those who had begun learning English at an older age (more than 15 years). They found that performance patterns were different for the two learner groups. The linguistic structure tested in the item affected participants' ability to respond correctly and task modality produced reliable response differences for the two learner groups. Furthermore, the results indicated that age of learning influenced achieved proficiency through all ages tested rather than defining a critical period. It failed to provide sufficient evidence to accept the hypothesis that there is a critical period for second language acquisition.

Several researchers (Marinova-Todd, Marshall, & Snow, 2000; Singleton, 2003; Singleton & Ryan, 2004) also pointed out some misinterpretations about age and second language learning and provided a new direction for looking at the relationship between age and bilingualism. Young children were neither globally more nor less efficient and successful than older learners in bilingualism. There are many factors that influence the level of bilingualism and simple statements about age and second language learning are over-simplistic. Second, children who learned a second language at an early age were likely to achieve higher levels of proficiency than those who began after childhood. This difference between younger and older learners reflected typical outcomes rather than potential. Additionally, this may be related to the social context such as the school in which language is acquired and maintained or lost as well as to the psychology of the individual learner (e.g., motivation, opportunity). Finally, the length of exposure (e.g. the number of years of second language context) is an important factor in being bilingual. There is a possibility of late learners becoming highly proficient, particularly when they are strongly motivated or have strong needs or excellent

opportunity. Therefore, age differences reflect differences in the situation of learning rather than in the capacity to learn (Marinova-Todd et al., 2000)

Gender and Creativity

A array of studies have focused on descriptions of gender differences on creativity (Abra, 1991; Ai, 1999; Norlander, Erixon, & Archer, 2000). Some studies (Mayton, 1966; Torrance, 1969) reported that boys were superior on flexibility and originality, but girls were superior on elaboration. They showed that for boys, flexibility was the predominant factor that related to all six academic subject areas, while for girls, elaboration related to four of the academic subject area, including Spanish, Basque, English, and social science. These differences could be explained by the different definitions of the gender roles for boys and girls in most cultures. In general, girls are likely to be expected to make things fancy and work out the details of plans in schools as well as at home. Boys tend to be allowed more freedom than girls in trying to do the unusual things that they want to do. Therefore, it is plausible that the different identification of the gender roles determines the gender differences in creativity (Ai, 1999).

The different patterns of the effects of anticipated evaluation on creativity were found across gender. Baer (1997) investigated gender differences in the effects of anticipated evaluation on creativity with junior high school girls and boys. The results of several pilot studies using students ranging in age from 5 to 13 suggested a possible developmental trend in such differences. The older girls suffered more on their creativity when they anticipated evaluation than boys of the same age under the same conditions. The negative effects of extrinsic motivation, in the form of anticipated evaluation, include both undermining creative performance and lessening intrinsic motivation (Ambile, 1983). In Baer's study, participants wrote original poems and stories under conditions favoring both intrinsic and extrinsic motivation.

These poems and stories were judged for creativity by experts. In this study, he found a significant interaction between gender and motivational condition: girls' creativity decreased markedly under extrinsic constraints, but boys did not.

However, several researchers studied creativity comparing androgynous groups with gender groups. Androgynous group consisted of individuals with both stereotypical masculine and feminine behavior traits (Bem, 1977). McKinnon (1962) stated that creative males and females exhibited attitudes and interests more readily considered typical for the opposite sex. Torrance (1963) found that creative males possessed more feminine characteristics than their peers and that creative girls are perceived to be more masculine than other girls. Helson, (1967) investigated the creativity of female scientists and found that the creative groups received significantly higher judgments for the specific characteristics that were categorized as typical female and male gender characteristics, including individualism, originality, concentration, artistry, complexity, courage, emotion, fascination, and self-orientation. Several researchers found psychological benefits of psychological androgyny, including more adaptive or flexible behavior (Bem, 1974; Ramanaiah, Detwiler, & Byravan, 1995; Vonk & Ashmore, 1993). Norlander, Erixon, & Archer (2000) investigated the involvement of gender roles and personality traits in 200 college students in a cluster of tests involving individuals' creative ability. Five gender-role types based on masculinity or femininity scales were derived as the androgynic, stereotypic, retrotypic, midmost and undifferentiated types. The results of this study indicated that the androgynic group outperformed other groups on creativity and on creative attitude. Thus, Norlander et al. suggested that androgynic individuals tend to be more creative than stereotypic gender role groups. Stereotypic groups obtained the lowest scores among participants. Runco (2004) suggested that the androgynous individual may have more options available in solving problems, rather than just options that are stereotyp-

ical of a certain gender role, and he or she may be more flexible than the stereotyped males or females.

Age and Creativity

The array of research that has focused on creativity does not reach a consensus on how creativity is related to age. Some studies reported a positive relation between creativity and age. Smith and Carlsson (1983) found benefits of aging on children's creativity. They found an increase in creative production in children between the ages of 10 to 11 judged by professional artists. Smith and Carlsson (1985) also reported positive aging effects on adolescent's creativity. They found an increase in creativity for adolescents at 14 to 15 years of age followed by a more marked increase at 16 years of age. The similar pattern of relation between creativity and age were found in the visual arts. The work of the visual artists got better as they grew older (Lindauer, Orwoll, & Kelley, 1997). Although quantity was dampened somewhat more than quality with aging, artists considered their later years as the best ones. The benefits of age in the artists' work can be explained as shifts in styles and in the sources of their original ideas. With increasing age, the artists had a better understanding of their work and themselves, and became more concerned about events in the world and the people around them. Additionally, circumstances attendant to aging also revised their priorities, giving art more prominence and invigorating their motivation, which led to new techniques, greater conceptual freedom, increased abstraction, more experimentation and revised subjects. Increased creativity with aging occurred for straightforward and practical reasons. (Lindauer, Orwoll, & Kelley, 1997) found a continuous increasing creativity with eighty-eight graphic artists in 60s, 70, and 80s.

Other researchers have investigated a nonlinear developmental trend in creativity, including age curves on creativity. For example, creative productivity tended to rise fairly

rapidly to a definite peak and thereafter declined gradually until output was about half the rate at the peak (Cole, 1979; Diamond, 1986). However, the location of the peak, as well as the post peak decline, tended to vary depending on the domain of creative achievement (Simonton, 1988). Additionally, some research has indicated a more complex age curve with two separate peaks (Eagly, 1974; Haefele, 1962). The double peak curves indicated the emergence of a secondary upswing in creative work around retirement age. The slump between the two optima in this saddle-shaped age curve frequently occurs sometime in the early or middle 40s (Simonton, 1988).

A slump in creativity across age is another developmental aspect of creativity. For example, Runco (1991) compared the relation between creativity and evaluative skills. In this study, Runco found a significant relation between divergent thinking and evaluative skills. He explained the slump in creativity during childhood by the acquisition of evaluative skills; as children become more conventional in their beliefs, their artwork becomes more realistic and less creative because they develop critical and evaluative skills.

The relation between age and creativity has been controversial among researchers. Other variables affecting the results may have been the type of creativity expressed across ages rather than the number of creativity products. Wu, Cheng, Ip, & McBride-Chang (2005) conducted a study to explore different patterns of performances on three types of creativity tasks, including real-world problems, figural tasks, and verbal tasks, with 22 sixth grade students and 22 university students from Hong Kong. The results of this study indicated that university students outperformed sixth grade students on the real-world problem, while sixth grade students outperformed university students on the figural tasks. The different patterns of performance on creative tasks reflected an interaction between task structures and students' knowledge bases. Knowledge enhances one's performance in knowledge-rich

creativity tasks (Weisberg, 1999), whereas functional fixedness may occur in a knowledge-lean task. According to Wu et al., (2005) university students' rich experience contributed to the higher variety in their responses than seen in the responses of the sixth graders. In contrast, sixth grade students showed superiority on the figural task because the task required little knowledge. Experienced university students did not have any advantages on this task. Runco (1996) stated that individuals might lose their abilities to make choices, if they rely entirely on past experience. He also asserted that the effect of functional fixedness made individuals less competent to solve problems or give ideas in an unusual or creative way because the individuals were used to solving them in a standard way.

CHAPTER 3

METHOD

Sample

The Atlanta Korean American school in Atlanta, Georgia, is the biggest Korean American school in Georgia. It is also the third-largest Korean American school in the United States, with a student population of 446 students ages 5 to 17. Students attend 34 classes in three different levels: primary, intermediate, and advanced. Students are assigned a level depending on their Korean language ability and their age. However, in this study, to determine the level of the participants' bilingualism, I provided bilingualism tests for the participants because the different levels of classes in the Atlanta Korean American school considered only the students' Korean language ability, not their abilities in both languages: English and Korean. The Korean American school of Atlanta is a private Saturday school that requires extra tuition payment from parents. Students come from all around the Atlanta area. The students who attend the school come from middle-class families that have high educational expectations for their children. In this study, although it was not perfectly matched, the students' SES and family background could be controlled to some degree because of the school's homogeneity in those characteristics. The students in the Atlanta Korean American school are educated in Korean (mainly reading and writing) by qualified Korean teachers. The students have opportunities to practice Korean traditional arts or music as well as Korean language skills.

Table 3.1

Descriptive Statistics for Gender on Age

	N	M	SD
Male	49	11.84	2.285
Female	65	11.26	2.477
Total	114	11.51	2.403

In this study, students under age 7 were excluded because they could not reach the dual language ability needed to complete the measure of bilingualism called the Word Association Test (WAT). The participant inclusion criteria in this study included students who had more than two years of schooling in the U.S, who had Korean speaking parents, and who had at least 75 correct responses on the WAT. This was necessary in order to screen students who had balanced low ability in both Korean and English.

A total of 116 Korean American students attending the Atlanta Korean American School participated in this study. Originally, 173 students had permission from their parents, but 38 students did not complete at least one of the three tests: WAT, SSR and TTCT. Nineteen students were excluded from this study based on their failure to meet the inclusion criteria.

The participants consisted of 49 male students with the mean age 11.84 (range 8-16; SD=2.285) and 65 female students with the mean age 11.26 (range 7-18; SD=2.477). Two student unspecified their gender on the data.

Instruments

In this study, three different instruments were used to measure two different abilities, bilingualism and creativity.

Instruments for Bilingualism

The Word Association Test (Lambert, 1956) and the Subjective Self Rating (SSR) were used for determining the students' level of bilingualism. The WAT is one of the most widely used measurements for measuring bilingualism (Carringer, 1974; Cummins & Gulututsan, 1974; Konaka, 1997; Lambert, 1956; Peal & Lambert, 1962; Wang, 1982;). Lambert developed the WAT using 16 English words and 16 French words that were most frequently used. For each language, stimuli were composed of eight nouns and eight adjectives. The nouns were chosen from the categories of either concrete or abstract.

To measure Korean American students' degree of bilingualism in Korean and English, the present study used 16 English words from Lambert's list and 16 Korean words chosen based on the Korean frequency list from the Korean Frequency Report (2005). The Korean words list was modeled on Lambert's criteria.

The English stimuli consisted of 16 English words: large, garden, happy, idea, food, little, dear, honor, child, house, peace, rich, thought, strong, sad, and bad. These words fit into categories of concrete nouns, abstract nouns, or adjectives. In addition, the eight nouns included four concrete words: child, house, garden, food, and four abstract words: idea, thought, peace, honor.

The Korean stimuli consist of 16 Korean words: 사람 (people), 집 (house), 학교 (school), 어머니 (mother), 마음 (mind), 생각 (thought), 시간 (time), 사랑 (love), 좋은 (good), 새로운 (new), 큰 (big), 중요한 (important), 어렵다 (difficult), 쉽다 (easy), 높은 (high), and 작은 (small). In addition, these 16 words can be categorized as adjectives: 좋은 (good), 새로운 (new), 큰 (big), 중요한 (important), 어렵다 (difficult), 쉽다 (easy), 높은 (high), 작은 (small), and nouns: 사람 (people), 집 (house), 학교 (school), 어머니 (mother), 마음 (mind), 생각 (thought), 시간 (time), and 사랑 (love). Moreover, among eight nouns,

Table 3.2

Word List of WAT

	Concrete Noun	Abstract Noun	Adjective
English	child, house, garden, food	idea, thought, peace, honor	large, happy, little, sad dear, rich, strong, bad
Korean	사람 (people), 집 (house), 학교 (school), 어머니 (mother)	마음 (mind), 생각 (thought), 시간 (time), 사랑 (love),	좋은 (good), 새로운 (new), 큰 (big), 중요한 (important), 어려운 (difficult), 쉬운 (easy), 큰 (high), 작은 (small)

four are concrete: 사람 (people), 집 (house), 학교 (school), and 어머니 (mother) and 4 are abstract: 마음 (mind), 생각 (thought), 시간 (time), and 사랑 (love). On the WAT, Korean and English words were presented alternately and the subjects were asked to write down as many words as they could think of which seemed to "go with" or "belong with" the stimulus word. For each participant, the sum of the associations for all the Korean words were calculated; the same was done for the association of the English words. These sums were the main considerations for getting a balanced score:

$$\text{Balance} = \frac{(\text{balanced score for English}) - (\text{balanced score for Korean})}{(\text{balanced score for English}) + (\text{balanced score for Korean})} \times 100 \quad (3.1)$$

If the score was zero, it indicated that the participant had a perfect balance between the two languages. A positive score indicated that the participant was English dominant, while a negative score meant that the participant was Korean dominant. The absolute value of the score indicated the magnitude of the difference from being balanced. Thus, a student

with a +75 was much stronger in English than Korean, and a student with a -75 was much stronger in Korean than in English. The scores for level of bilingualism ranged from ± 20 to ± 75 (Peal & Lambert, 1962; Carringer, 1974; Cummins & Gulutsan, 1974; Wang, 1982; Konaka, 1997). The lower number of 20 indicated balanced bilingualism, while the higher number of 75 indicated monolingualism.

The WAT appeared to have appropriate inter-rater reliability and intra-rater reliability. Semel (1992) reported that inter-rater coefficients range from .78 to .89 and the intra-rater reliability coefficients range from .68 to .82 for WAT. With the WAT, we can get the information on each subject's level of bilingualism.

The other instrument for measuring of bilingualism is the Subjective Self Rating (SSR) (see Appendix E). The scales have questions that rate participants' language ability to listen, speak, read, and write English and Korean on four-point scales rating from 4 (very well) to 1 (not at all). The maximum score for each language was 16. The level of bilingualism is determined by the ratio of the English and Korean self-rating.

In this study, balanced bilinguals were those who had score ± 20 or more than $|20|$, non-balanced bilinguals were those who had score between ± 21 and ± 74 , and monolinguals were those who had score ± 75 or more than $|75|$.

$$\text{Balance} = \frac{(\text{balanced score for English}) - (\text{balanced score for Korean})}{(\text{balanced score for English}) + (\text{balanced score for Korean})} \times 100 \quad (3.2)$$

The SSR scores used the same scale as the WAT. The scores for the participants' level of bilingualism ranged from ± 20 to ± 75 . The lower number of $|20|$ indicates balanced bilinguals, while the higher number of $|75|$ indicates monolinguals.

For the SSR, no technical information of reliability and validity was available from the authors or the publisher. However, several researchers provided empirical support for the

instrument (Peal & Lambert, 1962; Cumming & Gulututsan, 1974; Wang, 1982; Konaka, 1997).

Instrument for Creativity

In this study, the Torrance Test of Creative Thinking - Figural was used for measuring participants' creativity. The Torrance Test of Creative Thinking (TTCT) was developed by Torrance over a period of more than twenty-five years (Torrance, 1974). Torrance and his associates deliberately tried to use activities that were models of the creative thinking process, each involving different kinds of thinking and each contributing something unique to the batteries under development. The TTCT includes verbal and figural batteries of test activities for use in all cultures, from kindergarteners through adults. It was used in three-quarters of all recently published studies of creativity involving elementary and secondary school children (Bear, 1993). It is the most widely used instrument in the measure of creativity (Davis, 1998).

The TTCT Figural uses three picture-based exercises to assess creativity. As it is not based on respondents' verbal ability, it can be a culturally fair measurement for people who are not native English speakers. The TTCT has two equivalent forms, A and B. Each form consists of three activities: picture construction, picture completion, and repeated figures of lines or circles. Each of the three activities should be finished within ten minutes. Respondents should generate an idea that no one else can think of using a given stimulus and draw a picture of it. The stimulus must be an integral part of the picture. Since it asks respondents to draw a picture using a given stimulus, verbal ability does not influence the measure of creativity.

The TTCT has five norm-reference criteria for measuring creativity, including Fluency, Originality, Elaboration, Abstractness of Titles and Resistance to Premature Closure,

and 13 additional criterion reference measures of Creative Strengths. The Creative Strengths is comprised of subsets of Emotional Expressiveness, Storytelling Articulatness, Movement or Action, Expressiveness of Titles, Synthesis of Incomplete Figures, Synthesis of Lines or Circles, Unusual Visualization, Internal Visualization, Extending or Breaking Boundaries, Humor, Richness of Imagery, Colorfulness of Imagery, and Fantasy. Each subscale was developed based on psychological factors that had been identified by researchers (Baer, 1993; Torrance 1962, 1965).

- Fluency: The number of relevant idea
- Originality: The number of statistically infrequent ideas
- Elaboration: The number of ideas added
- Abstractness of titles: The degree beyond labeling
- Resistance to Premature Closure: The degree of psychological openness.

The raw score of these five subscales are converted into standard scores with means of 100 and standard deviations of 20. The standard scores are used for measuring creativity. The standard scores for each of the given norm-referenced measures are averaged to produce an overall indicator of creative potential. The creative strengths are scored as 0, 1, or 2 points. The total creative strength points, referred to as a bonus points, can range from 0 to 26 and are added to the average score to get the total creative index score of the individual. The Creative Index is generated by composting of the score of Creative Strengths and the average of the five subscale scores.

According to the TTCT figural manual (1990), the product-moment reliability coefficients that were obtained ranged from .92 to .94. Most test-retest reliabilities over short

periods are in the 60s and 70s. The substantial body of research also reports high reliability for fluency, originality, and elaboration (Clapham, 2004; Torrance, 1992; Treffinger, 1985). Reliability coefficients were reported as follows: Fluency= .92; Originality= .94, Elaboration= .92 (Torrance, 1992). The inter-rater reliability study conducted by Scholastic Testing Service (1998) reported that inter-rater reliability of TTCT figural is above .90. Thus, the TTCT-Figural can be seen as a reasonably reliable measurement of creativity (Treffinger, 1985).

Several validity studies with the TTCT figural have been conducted. Torrance conducted several major studies to examine the predictive validity of the instrument (Torrance, 1972, 1980, 1981; Torrance & Wu, 1981; Torrance 2002). In those studies, the measures of fluency, originality, and elaboration yielded satisfactory evidence of validity (overall, a validity coefficient of .51). The Torrance Tests of Creative Thinking Streamlined Scoring Guide, Figural A and B (1992) reported that predictive validity of most of the scoring variables appears to be fairly satisfactory with a range of .79 to .84. Plucker (1999) found that although the path coefficient for TTCT to adult creative achievement was .60, the path coefficient from IQ scores was .19. Second, the construct validity of the TTCT was studied by Torrance (1982). The result of this study stated that the number of criterion-referenced indicators significantly correlated with the right hemisphere styles of thinking, creative personality characteristics, innovative style of management, creative motivation, and Rorschach Movement and Originality. Finally, in terms of concurrent validity, Gonzales and Gonzales and Campos (1997) reported that the scores of the Spatial Test of Primary Mental Abilities (PMA) and the Gordon Test of Visual Imagery Control have a significant correlation with the TTCT scores.

Procedure

I contacted Sunwoo-Inho, the principal of the Korean American school, about getting permission for administering tests and collecting data during special classes at his school. I explained the test procedure, including testing time, types of tests, and what the students were supposed to do during the tests.

I created two different versions of a consent form, one in Korean and one in English. After I got permission from the principal, the written consent forms were distributed to the parents by classroom teachers and collected two weeks later. The consent form informed students and their parents of my intent to investigate the students' level of bilingualism through the WAT and the SSR, and to investigate creativity through TTCT. Both students and parents were informed that the students' responses would be reported to them and would be kept confidential.

After collecting the consent forms, I started to collect data. For data collection, three different tests, including the Word Association Test, the Subjective Self Rating for measuring the participants' level of bilingualism, and the Torrance Tests of Creative- Figural for measuring participants' creativity were used.

I administered these three tests in a cafeteria during a special class time. The Atlanta Korean American school is the Saturday school that provides Korean language programs for Korean American students. The school also provides creative activities, including dance, arts, Tae Kwon Do (Korean martial art), and music during 45 minute special classes. An instructor, rather than a classroom teacher, conducts each special class in a different classroom. The participants came to the cafeteria to take the tests during their special classes assigned at different times depending on the class levels that each participant belonged to.

Therefore, participants kept moving in and moving out of the cafeteria while other students were taking their tests.

Participants were expected to complete tests for two areas: bilingualism and creativity. To ensure reliable test results, the Word Associate Test and the Self-Rating Scale were used in two different versions: the English and the Korean version. Participants chose to take one version of each of the tests, depending on their language preference. The tests were administered in the same order every time.

The testing session for bilingualism, including the Word Association Test and the Subjective Self Rating took 45 minutes. The Word Association Test took 35 minutes and the Self Rating Scale took ten minutes. The testing session for creativity, including the Torrance Tests of Creative-Figural, took 35 minutes.

The responses were collected and scored by the researcher, who had been trained and certified for TTCT scoring. The results were reported confidentially to each student as a written document.

Data Analysis

The Relationship between Bilingualism and Total Score of Creativity (Creative Index on TTCT)

In order to answer the first question of whether there are any relationships between the degrees of bilingualism and creativity, descriptive statistics with the mean and standard deviation for participants' bilingualism scores (WAT and SSR) and creativity total score (Creativity Index) were examined. Then, a Pearson correlation analysis was carried out between bilingualism scores (WAT and SSR) and Creative Index scores to examine whether the two different abilities are significantly associated with each other. Further I performed

an Analysis of Variance (ANOVA) to investigate if there are any significant differences in participants' creativity abilities depending on their degree of bilingualism.

The Independent samples t-test was used to examine gender differences on each variable (WAT and Creative Index). The gender difference in the relationship between bilingualism and creativity was examined with the Pearson correlation analysis. The correlation between the bilingualism scores (WAT) and Creative Index score was carried out to examine whether two different abilities have a significant relationship by gender. An Analysis of Covariance (ANCOVA) was conducted to investigate if there are any significant gender effects on participants' creativity depending on their degree of bilingualism.

Finally, I conducted a Pearson correlation analysis between participants ages and each variable (WAT, SSR, and Creative Index) to test if there are any developmental effects on levels of bilingualism or creativity and their relationship.

Relationship between the Degrees of Bilingualism and the Creativity Styles (Innovative creativity and Adaptive creativity)

In order to answer the second question I used composite creativity scores (Innovative creativity: Fluency and Originality, Adaptive creativity: Elaboration and Abstractness of titles) to investigate any relationship between style of creativity and degree of bilingualism. The scores of Resistance to Premature of Closure were excluded because of the double loading on the two styles (Kim, 2006b). The Creative strengths scores was also excluded because it is not a standardized score, although it was categorized as Adaptive creativity on Kim's study.

The descriptive statistics with mean and standard deviation for each participant's creative style score was examined. Then, a Pearson correlation analysis was carried out between bilingualism scores (WAT and SSR) and Creative style scores (Innovative creativity

and Adaptive creativity) to examine whether there are any significant differences between degree of bilingualism and creative styles. Further, I conducted an Analysis of Variance (ANOVA) to investigate if there are any significant differences in participants' creative styles depending on their degree of bilingualism.

I conducted the Independent samples t-test to investigate gender differences in each creative style. A Pearson correlation analysis between each creative style and bilingualism by gender was also conducted to examine if there were any significant gender differences in the relationship between the degree of bilingualism and creative styles. An Analysis of Covariance (ANOVA) was conducted to investigate if there are any significant gender effects on participants' creative style depending on their degree of bilingualism.

Finally, I conducted a Pearson correlation analysis of participants' ages and their creative style scores to test if there are any developmental effects on creative styles and the degree of bilingualism.

The Relationship between the Degrees of Bilingualism and Separate Creative Abilities (Subscale Scores on TTCT)

In order to examine whether there are any relationships between the degrees of bilingualism and separate creative abilities, including Fluency, Originality, Elaboration, Abstractness of title, Resistance to premature closure, and Creative strengths on the TTCT, I conducted the descriptive statistics with mean and standard deviation for each separate creative ability. I performed a Pearson correlation analysis between bilingualism scores (WAT and SSR) and separate scores of creative abilities on the TTCT to examine whether degrees of bilingualism are differently associated with separate creative abilities. Further, an Analysis of Variance (ANOVA) was conducted to investigate if there are any significant differences in participants' separate creative abilities depending on their degree of bilingualism.

I conducted an Independent samples t-test to examine gender differences on separate creative abilities. The gender difference on the relationship between bilingualism and separate creative abilities was also examined with the Pearson correlation analysis. The correlation between the bilingualism scores (WAT) and each separate creative ability score of TTCT was carried out for males and females separately. The Analysis of Covariance (ANCOVA) was conducted to investigate whether there were any significant differences in participants' separate creative abilities depending on their degree of bilingualism by gender.

Finally, I used a Pearson correlation analysis of participants' ages and separate creative abilities test if there are any developmental effects on creative styles and the degree of bilingualism.

CHAPTER 4

RESULTS

Background of Participants

A total of 116 participants were involved in this study. A background questionnaire was provided for the participants to collect demographic information. The results of the responses on the questionnaires are reported in Table 4.1. Eighteen students did not answer the questionnaires, so information for 98 students was collected.

Questionnaire responses showed that the Korean American participants had been in American for 8.657 years and had been in Korean ls for 2.731 years. They also showed more years attending American schools (6.919 years) than Korean schools (4.076 years), including schools in Korea or Korean American schools in the U.S. Even when they reported 4.076 years attending Korean schools, it was mostly years of attending Korean American schools in U.S. Therefore, the participants had spent most of their time in American schools. For parents' language use in communicating with their children, 65 % of the participants reported their fathers' high frequency of speaking Korean at home. They also reported that their fathers spoke both languages at a similar percentage as their fathers spoke Korean: 65 % spoke mostly Korean, 63 % spoke mostly Korean and English, and 22 % spoke mostly English. There is some confusion about participants' responses, because some participants marked two options (i.e., marked "speak mostly in Korean" or "speak mostly English" and "speak Korean and English" at the same time).

For the mothers' use of language in their communication with the participants, participants reported that their mothers mostly spoke Korean or use both languages when

Table 4.1

Descriptive Statistics Background Questionnaires

	N	Min	Max	M	SD
Years of Unites States	96	.30	15.00	8.6573	4.04170
Years of Korea	96	.00	12.24	2.7317	3.46025
Years of attending American school	98	.20	15.00	6.9194	3.52200
Years of attending Korean school	98	.00	11.00	4.0765	2.69053
Older sister	24	1.00	27.00	14.8750	5.86302
Younger sisters	35	.00	13.00	7.3857	3.67841
Older brother	18	6.00	21.00	13.8889	4.37760
Younger brother	19	5.00	11.00	8.3158	1.85750
Hours spending American TV in a day	97	.00	7.00	1.5448	1.23401
Hours spending Korean TV in a day	96	.00	3.00	.6740	.75184
Hours spending English book in a day	96	.00	9.00	1.8333	1.74964
Hours spending Korean book in a day	96	.00	5.00	.2922	.64041

speaking to them: 73 % speak mostly Korean, 41 % speak both languages, and 19 % speak mostly English. As we can find in the responses, both parents showed less use of English than Korean in communication with their children.

For information regarding their siblings, the participants' responses showed that 21 % of participants had an older sister with the mean age 14.9, 15.5 % of participants had an older brother with the mean age 13.9, 30.2 % of participants had a younger sister with a mean age 7.4, and 16.4 % of them had a younger brother with the mean age 8.3. Some of them had more than one sibling, and 15 % of participants answered as an only child.

For the amount of time spent on resources for each language (television and books), the responses of participants showed that they spend more time watching American television and reading English books a day (M = 1.544 hours, M = 1.833 hours) than watching Korean television and reading Korean books (M = .674 hours, M = .292 hours).

Table 4.2

Mean for Male (N = 39) and Female (N = 59) on Background Questionnaires

	M	
	Male	Female
Years in Unites States	8.535	8.643
Years in Korea	3.0270	2.590
Years of attending American school	7.2974	6.6237
Years of attending Korean school	4.0000	4.0424
Older sister	15.4000	14.5000
Younger sister	8.6250	6.7391
Older brother	15.0000	13.0000
Younger brother	8.1429	8.4167
Hours spending American TV in a day	1.5135	1.5907
Hours spending Korean TV in a day	.5986	.7314
Hours spending English book in a day	1.8875	1.8144
Hours spending Korean book in a day	.3542	.2593

Gender Difference on Background Information

The gender differences are reported in Table 4.2. The male and female participants had similar backgrounds in terms of their years of stay in the U.S, their years in Korea, and the time spent on resources (television or books) for either language. Male participants reported more years staying in Korea, more years attending American schools, and longer time reading books in both languages than their female counterparts.

Bilingual Groups on Background Questionnaire

The data showed that participants who are more balanced in two languages spent more years in Korea: the balanced bilingual groups reported that they spent more years in Korea (3.780 years) than other groups (Non-balanced: 1.675 years, Monolinguals: .875 years). This is a reasonable because most of the participants in this study were those who use Korean as their second language. For access to language resources, the balanced bilinguals

Table 4.3

Frequencies for Gender on Background Questionnaires

	Male		Female	
	Frequency	%	Frequency	%
Mothers mostly speak English	3	6.1	5	7.7
Mother mostly speak Korean	32	65.3	52	80.0
Mother mostly speak Korean and English	16	32.7	32	49.2
Father mostly speak English	5	20.2	17	26.2
Father mostly speak Korean	27	55.1	48	73.8
Father mostly speak Korean and English	28	57.1	46	70.8

spend more time reading Korean books than other groups. There are no higher means of the balanced bilinguals found on the rest of the items.

For the frequencies, as noted above, both of the parents in different groups of bilinguals used Korean or both Korean and English more than English only in communication with their children. Additionally, the balanced bilinguals have more siblings (81.1 %) with whom they can talk than the other groups (Non-balanced: 71.1 %, Monolinguals: 66.7 %). However, specifically, no higher rate of having older siblings was found for the balanced bilinguals. Instead they have a higher rate of having younger sisters than members of other groups.

Data Screening

Normality

The normal distribution is the basic assumption for using several statistical methods, including t-test, Pearson correlations, and Analysis of Variance. If the variables are not normally distributed, a researcher should use a statistical method that can handle data that is not distributed normally.

The shape of the normal distribution is characterized by three properties: unimodality, which can be characterized as one high peak on the distribution; symmetry (e.g. skewness);

Table 4.4

Mean for Bilingual Groups on Background Questionnaires

	M		
	Monolinguals	Non-balanced bilinguals	Balanced bilinguals
Years in Unites States	11.3750	9.5000	7.5429
Years in Korea	.8750	1.6757	3.7804
Years of attending American school	10.7222	7.5946	5.7120
Years of attending Korean school	4.7222	3.9324	4.0100
Older sister	17.5000	15.9167	13.1000
Younger sister	11.0000	7.1538	7.1250
Older brother	19.6667	10.5000	13.5455
Younger brother	9.5000	8.4000	8.0909
Hours spending American TV in a day	1.6944	1.4459	1.5939
Hours spending Korean TV in a day	.4778	.7611	.6531
Hours spending English book in a day	2.4444	1.9208	1.5684
Hours spending Korean book in a day	.1111	.2653	.3469

Table 4.5

Frequencies for Bilingual Groups on Background Questionnaire

	Monolingual		Non-balanced bilingual		Balanced bilingual	
	Frequency	%	Frequency	%	Frequency	%
Mother speak English mostly	0	0	1	2.6	7	13.2
Mother speak Korean mostly	8	88.9	30	78.9	45	84.9
Mother mostly speak Korean and English	3	33.3	21	55.3	24	45.3
Father mostly speak English	2	22.2	8	21.1	12	22.6
Father mostly speak Korean	6	66.77	24	63.2	44	83.0
Father mostly speak Korean and English	8	88.9	31	81.6	35	66.0
Siblings	6	66.7	27	71.1	43	81.1
Older sister	2	22.2	12	31.6	10	18.9
Younger sister	1	11.1	13	34.2	20	37.7
Older brother	3	33.3	4	10.5	11.	20.8
Younger brother	2	22.2	5	13.2	11.	20.8

Table 4.6

Descriptive Statistics with Skewness and Kurtosis for Response Variables

	N	Min.	Max.	Mean	Std. Dev.	Skewness	Kurtosis		
	Stat.	Stat.	Stat.	Stat.	Stat.	Stat.	Stat.	Std. Error	Std. Error
Fluency	116	59.00	150.00	111.6250	23.87217	-.153	.225	-.935	.446
Originality	116	51.00	152.00	108.1429	23.28756	-.235	.225	-.447	.446
Elaboration	116	51.00	152.00	98.1339	21.70534	.112	.225	-.221	.446
Abstractness of Titles	116	.00	198.00	83.5625	35.43218	-.162	.225	.635	.446
Creative Strengths	116	1.00	16.00	8.7522	3.66779	-.029	.225	-.817	.446
Creative Index (CI)	116	60.40	155.20	108.6054	18.64240	-.248	.225	-.173	.446
WAT	116	.00	100.00	25.6951	22.76506	1.543	.225	2.235	.446
SSR	116	-7.14	39.13	17.4577	10.14026	-.166	.225	-.364	.446

and moderate spread (e.g. Kurtosis) (Huck, 2000). The normality of variables in this study are reported in Table 4.6

Based on Kline's recommendation (2002), $|3.0|$ for skewness and $|8.0|$ for kurtosis, there were no values of skewness and kurtosis greater than Kline's values. This indicated that each variable in this data set was approximately normally distributed.

Outliers

It may be the case that outliers have an undue influence on the results of analysis. Data was screened for outliers using DeCarlo's SPSS Macro 15th. Although there were three outlier, case #1, case #11, case # 61, which were significant at the .05 level, no corrective action was taken because removing them did not influence the results. Relationship between Bilingualism and Total score of Creativity (Creative Index on TTCT)

The Relationship between Bilingualism and Total Score of Creativity

(Creative Index on TTCT)

In this study, the relationship between bilingualism and creativity was measured using scores on two different bilingualism measures (WAT & SSR) and the total score on TTCT-Figural (Creative Index). The descriptive statistic for each variable is reported in Table 4.6.

The correlation coefficient was calculated to examine the association between bilingualism and creativity. The relationship between the two different abilities is reported on Table 4.7. Two measures of bilingualism were moderately correlated with each other ($r = .369, p < .01$) because they measured the same ability, bilingualism. However, their moderate correlation indicated that although they measured the same ability, the ways they measured the bilingualism were different to some degree: the WAT is the test that counts students' correct answers in both languages, while SSR (Subjective Self Rating) is the students' self report of their competence in both languages. Therefore, it was expected that using two different types of bilingualism measures could provide more accurate information for the participants' degree of bilingualism, and the relationship between participants' degrees of bilingualism and their creativity.

The correlation matrix revealed that the WAT scores were inversely correlated with Creative Index scores ($r = -.191, p > .05$). The significantly negative correlation indicated that participants who are closer to balanced bilinguals on the WAT performed better on the Creative Index than those who are less balanced bilingual. The lower WAT score indicates a higher level of bilingualism:

$$\text{Balance score} = (\text{English} - \text{Korean} / \text{English} + \text{Korean}) \times 100. \quad (4.1)$$

Table 4.7

Correlations among Test Scores

	WAT	SSR	Creative Index (CI)
WAT	1		
SSR	.369**	1.000	
Creative Index	-.191*	-.030	1

** Correlation is significant at the 0.01 level (2-tailed)

* Correlation is significant at the 0.05 level (2-tailed)

The correlation between the scores of the SSR and those of total Creative Index was slightly negative but non significant, $r = -.030, p < .05$. The negative correlation coefficient indicated that positive relationship between bilingualism and creativity. The SSR scores were not counted in the relationship between the scores of bilingualism and those of the Creative Index.

The descriptive statistics of the Creative Index on Table 4.8 show the mean and standard deviation of the Creative Index, which is a total score of the TTCT, for each group as divided into language use groups by of the WAT. The balanced bilingual group had the highest mean and the smallest standard deviation (M= 109.635, SD=17.171) among the groups. The non-balanced bilingual group had M= 109.385 and SD=19.267, while the monolingual group had M= 99.060 and SD= 21.547.

Because the test indicated that the data met the assumption for normality and homogeneity of variance, it was appropriate to use the Analysis of Variance (ANOVA) (Huck, 2000) Testing the data showed that the variables were normally distributed. The non-significant Levene's statistic value indicated homogeneity of variance. However, the Analysis of Variance result revealed that there was no group difference in mean scores on the Creative Index ($F = 1.455, p = .238$). The ANOVA result meant that the mean difference among bilingual

Table 4.8

Descriptive Statistics for Bilingual Groups and Creative Index

	N	M	SD
Monolingual	10	99.0600	21.54727
Non-balanced bilingual	55	109.385	19.2673
Balanced bilingual	51	109.635	17.1716
Total	116	108.6054	18.64240

Table 4.9

Descriptive Statistics for Bilingual Groups on the WAT

	N	M	SD
Monolingual	10	76.4350	29.33856
Non-balanced bilingual	55	32.3524	11.86886
Balanced bilingual	51	8.8182	5.48545
Total	116	25.8973	22.86218
Monolinguals with score $\geq 75 $			
Nonbalanced bilinguals with $ 20 \leq \text{score} \leq 75 $			
Balanced bilinguals with score $\leq 20 $			

groups on the Creative Index was not significant any more when the participants were broken down into three groups: monolingual, non-balanced bilingual, and balanced bilingual. The breakdown of the bilingualism caused the loss of some individual information.

Gender Differences on the Relationship between Bilingualism and Total Score of Creativity

The Pearson correlation between the scores of WAT and the scores of Creative Index was calculated for males and females separately. As correlation coefficients on Table 4.11 indicated, male participants had higher correlations ($r = -.208, p > .05$) than female participants ($r = -.133, p > .05$). Although there were no significant correlation coefficients found

Table 4.10

The Analysis of Variance for Bilingual Groups on the Creative Index

	SS	df	MS	F	Sig.	Partial Eta Squared	Observed Power
Between Groups	1003.366	2	501.683	1.455	.238	.025	.304
Within Groups	38963.631	113	344.811				
Total	39966.997	115					

for both female and male participants, the positive relationship between the scores of the WAT and the scores of the Creative Index were reported.

The descriptive statistics of the Creative Index and of the WAT was reported in Table 4.12 and Table 4.13. Females had higher averages on the Creative Index score ($M=112.283$, $SD=18.840$) than males ($M=104.310$, $SD=17.468$). However, the average of the scores of the WAT for male participants ($M=31.959$, $SD=26.158$) were higher than for the female participants ($M=21.327$, $SD=18.982$). Independent samples t-test results were reported on Table 4.14 to examine gender differences in the relationship between the degree of bilingualism and creativity. The result of independent sample t-tests indicated gender differences on both WAT scores ($t(112)=2.515$, $p=.013$; effect size $r=.053$) and Creative Index scores ($t(112)=-2.307$, $p=.023$; effect size $r=.025$). According to Cohen (1998), $r's < .30$ are small effects; $.30 < r's < .50$ are medium effects; and $r's > .50$ are large effects.

However, the gender differences were weakened when they were examined after controlling the degree of bilingualism effect (WAT) on the Creative Index scores. The result of Analysis of Covariance (ANCOVA) was reported on Table 4.15. Using ANCOVA reduces the probability of a TYPE II error that is inversely related to statistical power (Huck, 2000 p. 536). ANCOVA results showed non-significant gender effects on the Creative Index ($F=3.438$,

Table 4.11

Pearson Correlation Between the WAT and the Creative Index by Gender

	Gender	
	Male	Female
	WAT	WAT
Creative Index	-.208	-.133

Table 4.12

Descriptive Statistics for Gender on the Creative Index (CI)

	Gender					
	Male			Female		
	N	M	SD	N	M	SD
Monolingual	7	95.1714	22.11769	3	108.133	21.1019
Non-balanced bilingual	28	105.1504	18.61051	26	113.976	19.6407
Balanced bilingual	14	107.2004	11.22804	36	111.405	18.5398
Total	49	104.3105	17.46834	65	112.283	18.8409

Table 4.13

Descriptive Statistics for Gender on the WAT

	Gender					
	Male			Female		
	N	M	SD	N	M	SD
Monolingual	7	84.9429	15.52920	3	56.5833	48.01495
Non-balanced bilingual	28	30.8234	10.57429	26	33.9991	13.13183
Balanced bilingual	14	7.7400	6.07195	36	9.2375	5.27127
Total	49	31.9595	26.15826	65	21.3273	18.98201

Table 4.14

Independent Samples t-Test on the Creative Index and WAT

	T	df	Sig. (2 tailed)	Mean Difference	Partial Eta Squared	Observed Power
Creative Index	-2.307	112	.023	-7.9725	.025	.304
WAT	2.515	112	.013	4.22680	.053	.461

Table 4.15

The Analysis of Covariance of Creative Index

	SS	df	MS	F	Sig.	Partial Eta Squared	Observed Power
Gender	1125.263	1	1125.263	3.438	.066	.030	.227
WAT	1038.880	1	1038.880	3.174	.078	.028	.206
Gender × WAT	.623	1	.623	.002	.965	.000	.050
Error	36326.855	111	327.269				
Total	1390006.211	114					

a Computed using $\alpha = .01$.

b R Squared= .072 (Adjusted R Squared= .055)

Table 4.16

Pearson Correlations between Age and Two Test Scores (Creative Index and WAT)

	Age
Creative Index (CI)	-.003
WAT	.093

$p = .066$) as well as non-significant bilingualism effects ($F = 3.174$, $p = .078$) on Creative Index. Additionally, there was no significant interaction between gender and the score of the WAT on the Creative Index scores ($F = .002$, $p = .965$). Consequently, gender effects on the relationships between the WAT scores and the Creative Index scores were not found in this study.

Age Differences on the Relationship between Degrees of Bilingualism and Total Score of Creativity (Creative Index on the TTCT)

The non-significant correlation coefficients between age and the scores of WAT, and the scores of TTCT were reported on Table 4.16. The non-significant correlation coefficients between age and the test scores indicated that participants' ages do not influence either their scores on the WAT or those of the Creative Index.

Table 4.17

Descriptive Statistics of the Creative Styles

	N	M	SD
Innovative style	116	109.8839	21.27797
Adaptive style	116	90.8482	24.30502

Relationship between the Degrees of Bilingualism and the Creative Styles

(Innovative Creativity and Adaptive Creativity)

In this study the researcher examined the relationship between the degree of bilingualism and the creative styles as the second research question. The creative styles consisted of Innovative creativity and Adaptive creativity. The scores of creative styles were calculated as the combination of the scores by subscales: Innovative creativity was the average scores of Fluency and Originality; Adaptive creativity was the average scores of Elaboration and Abstractness of titles. The scores of Creative Strengths were excluded from Adaptive creativity. The mean and standard deviation of each creative style were reported on Table 4.17.

The Table 4.18 lists the correlation between the scores of two different bilingual measures and the creative styles. Each bilingualism measure showed negative correlation with creative styles. The correlation coefficient of SSR on Innovative creativity was slightly negative but was not significant, $r = -.086, p > .05$. The SSR also had a non-significant negative correlation coefficient, $r = -.005, p > .05$, on Adaptive creativity. For the scores of WAT, a correlation of $r = -.187(p < .05)$ with the scores of Adaptive creativity and a correlation of $-.054(p > .05)$ with the scores of Innovative creativity showed a positive relationship between the scores of WAT and the scores of both creative styles. It indicated that both creative styles were positively associated with the degree of bilingualism regardless of the types of bilingualism were measured. However, the relationship between WAT and Adaptive

Table 4.18

Correlation between the Bilingualism and Creative Styles

	WAT	SSR
Innovative creativity	-.054	-.086
Adaptive creativity	-.187*	-.005

* Correlation is significant at the 0.05 level (2-tailed).

creativity was examined in the further analysis because a significant correlation was found only between WAT and Adaptive creativity ($r = -.187, p < .05$).

The mean and standard deviation for each creative style of the bilingual groups of WAT were reported in Table 4.19. The balanced bilingual group performed better ($M = 110.860, SD = 18.931$) than non-balanced bilinguals ($M = 109.384, SD = 21.875$) and monolinguals ($M = 107.650, SD = 30.173$) on Innovative creativity. The balanced bilinguals ($M = 90.7421, SD = 25.722$) and non-balanced bilinguals ($M = 93.409, SD = 22.886$) outperformed monolinguals ($M = 77.300, SD = 22.036$) on the Adaptive creativity of the TTCT.

The Analysis of Variance was implemented to examine the mean differences on Adaptive creativity across the bilingual groups. The results of the ANOVA revealed that there were no significant bilingual group differences ($F = 1.888, p = .156$) in terms of their mean scores of Adaptive creativity on the TTCT. The grouping of participants' bilingualism might cause the loss of individual information of their creativity as well as that of their degree of bilingualism.

Gender Differences on the Relationship between Bilingualism and the Creative Styles

As the descriptive statistics results on Table 4.21 reported, females had higher averages of Adaptive creativity ($M = 96.484, SD = 25.390$) than males ($M = 84.603, SD = 19.925$).

Table 4.19

Descriptive Statistics of the Creative Styles for the Bilingual Groups on WAT

		N	M	SD
Innovative creativity	Monolingual	10	107.6500	30.17362
	Non-balanced bilingual	55	109.3846	21.87505
	Balanced bilingual	51	110.8605	18.93159
	Total	116	109.8839	21.27797
Adaptive creativity	Monolingual	10	77.3000	22.03684
	Non-balanced bilingual	55	93.4099	22.88625
	Balanced bilingual	51	90.7421	25.72261
	Total	116	90.8482	24.30502

Table 4.20

The Analysis of Variance for Bilingual Groups on the Adaptive Creativity

		SS	Df	MS	F	Sig.	Partial Eta Squared	Observed Power
Adaptive creativity	Between Groups	2197.039	2	1098.519	1.888	.156	.032	.386
	Within Groups	65737.381	113	581.747				
	Total	67934.420	115					

However, the average WAT scores for male participants ($M = 31.95$, $SD = 26.15$) was higher than for the female participants ($M = 21.32$, $SD = 18.98$).

Independent samples t-tests of Adaptive creativity were reported in Table 4.22 to examine gender differences in adaptive creativity. The result of an independent sample t-test indicated significant gender differences in adaptive creativity ($t(112) = -2.705$, $p = .008$; effect size $r = .061$).

The correlation matrix between the scores of WAT and the scores of Adaptive creativity by gender reported that males had a stronger correlation ($r = -.287$, $p < .05$) between

Table 4.21

Descriptive Statistics for Gender on the Adaptive Creativity

	Gender					
	Male			Female		
	N	M	SD	N	M	SD
Monolingual	7	69.8571	17.82254	3	94.6667	24.20916
Non-balanced bilingual	28	85.7570	22.05977	26	101.7500	21.62418
Balanced bilingual	14	89.6677	12.69289	36	92.8333	27.86985
Total	49	84.6030	19.92584	65	96.4846	25.39023

Table 4.22

Independent Samples t-Test on the Adaptive Creativity

	T	df	Sig. (2 tailed)	Mean Difference	Partial Eta Squared	Observed Power
Adaptive creativity	-2.706	112	.008	-11.88166	.061	.765
WAT	2.515	112	.013	4.22680	.053	.461

the scores of Adaptive creativity and those of WAT than females ($r = -.083, p > .05$). However, the scores of WAT and the scores of Adaptive creativity were inversely correlated with each other on both male and female participants.

The gender effects on the degree of bilingualism and Adaptive creativity were weakened when the degree of bilingualism was controlled. The Adaptive creativity scores were analyzed using ANCOVA with WAT scores and gender to examine pure gender effects on the relationship between the degree of bilingualism and Adaptive creativity. ANCOVA results reported non-significant gender effects on Adaptive creativity ($F=1.150, p = .286$). Additionally, there were no significant interactions between gender and the scores of WAT on

Table 4.23

Correlation between the Bilingualism and the Adaptive Creativity by Gender

	Gender	
	Male	Female
	WAT	WAT
Adaptive creativity	-.287*	-.083

* Correlation is significant at the 0.05 level (2-tailed).

Table 4.24

The Analysis of Covariance of Adaptive Creativity

	SS	df	MS	F	Sig.	Partial Eta Squared	Observed Power
Gender	611.288	1	611.288	1.150	.286	.010	.186
WAT	1478.112	1	1478.112	2.781	.098	.025	.380
Gender × WAT	154.936	1	154.936	.292	.590	.003	.083
Error	58458.919	110	531.445				
Total	64260.566	113					

R Squared= .732 (Adjusted R Squared= -.263)

Adaptive creativity ($F = .295$, $p = .590$). Consequently, the gender differences on the relationship between the WAT scores and the Adaptive creativity scores were not found in this study.

Age Differences on the Relationship between Degrees of Bilingualism and the Creative Styles

The participants' ages were positively correlated to the score of WAT ($r = .093$, $p > .05$), and were negatively correlated with the score of adaptive creativity ($r = -.052$, $p > .05$). However, the correlation coefficients on Table 4.25 indicated that no significant relationships existed between age and the scores of WAT, and age and the scores of Adaptive creativity

Table 4.25

Correlations between Age and Two Test Scores (Adaptive Creativity and WAT)

	Age
Adaptive creativity	-.052
WAT	.093

Table 4.26

Descriptive Statistics for the Subscales of TTCT

	N	M	SD
Fluency	116	111.6250	23.87217
Originality	116	108.1429	23.28756
Elaboration	116	98.1339	21.70534
Abstractness of titles	116	83.5625	35.43218
Resistance of closure	116	97.8571	19.89313
Creative strengths	116	8.7522	3.66779

because their correlation coefficients were close to zero, which means no correlation between them.

The Relationship between the Degrees of Bilingualism and Separate Creative Abilities

(Subscale Scores on TTCT)

The TTCT consisted of six subscales, including Fluency, Originality, Elaboration, Abstractness of Titles, Resistance of Premature Closure, and Creative Strengths. The means and standard deviations for the subscales of TTCT were reported on Table 4.26.

The Pearson correlation was used to investigate the relationship between the separate abilities of creativity and the degree of bilingualism. The correlation coefficients between the scores of the subscales of TTCT and the scores of the bilingualism measures (WAT

Table 4.27

Correlation between the Scores of Separate Creative Abilities and the Scores of Bilingualism

	Fluency	Originality	Elaboration	Abstractness of titles	Resistance of closure	Creative strengths	WAT	SSR
Fluency	1							
Originality	.629**	1						
Elaboration	.484**	.472**	1					
Abstractness of titles	-.046	.165	.414**	1				
Resistance of closure	.233*	.378**	.129	.106	1			
Creative strengths	.119	.327**	.538**	.600**	.255**	1		
WAT	-.023	-.075	-.071	-.213*	-.094	-.250**	1	
SSR	-.047	-.110	-.002	-.006	.110	-.058	.369**	1

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

and SSR) were reported on Table 4.27. Among the six subscales, Abstractness of Titles ($r = -.213, p < .05$) and Creative Strengths ($r = -.250, p < .01$) had significant correlation with the scores of WAT. As the correlation results showed, the WAT had the strongest correlation with Creative strengths on TTCT. Although the rest of the subscales of TTCT had non-significant correlation coefficients with the WAT, they had negative correlation coefficients. This indicated that they are positively related to the degree of bilingualism measured by the WAT. The SSR did not have any significant correlation coefficients with the subscales of TTCT. However, the scores of SSR were also inversely correlated with the scores of the subscales of TTCT except with Resistance of closure. Thus, the SSR scores were not used to examine the relationship between the degree of bilingualism and creativity in the further analysis in this study.

Table 4.28

Descriptive Statistics of Abstractness of Titles and Creative Strengths for Bilingual Groups

		N	M	SD
Abstractness of Titles	Monolingual	10	62.1000	32.15051
	Non-balanced bilingual	55	85.7034	29.49639
	Balanced bilingual	51	85.4620	40.75492
	Total	116	83.5625	35.43218
Creative Strengths	Monolingual	10	6.3000	3.80205
	Non-balanced bilingual	55	8.9546	3.61583
	Balanced bilingual	51	9.0147	3.59180
	Total	116	8.7522	3.66779

The descriptive statistics of Abstractness of Titles and Creative Strengths on Table 4.28 showed the mean and standard deviation of the two separate creative abilities for each bilingual group of the WAT. The balanced bilingual group had the highest mean and the smallest standard deviation (M= 9.014, SD=3.591) on Creative Strengths among the bilingual groups. The non-balanced bilingual group had M= 8.954 and SD=3.615, while the monolingual group had M= 6.300 and SD= 3.802. The balanced bilinguals (M= 85.462, SD=40.754) and non-balanced bilinguals (M= 85.703, SD=29.496) had higher means of Abstractness of Titles than monolinguals (M= 62.100, SD=32.150).

However, the Analysis of Variance result revealed that there were no group differences on the mean scores of Abstractness of Titles (F= 2.045, p = .134) or on Creative Strengths (F= 2.541, p = .085). The ANOVA result meant that there was insufficient evidence to support the mean differences among bilingual groups on their scores of Abstractness of Titles and on those of Creative Strengths. The grouping of participants depending on their degree of bilingualism might cause the loss of individual information.

Table 4.29

The Analysis of Variance for Bilingual Groups on Abstractness of Titles and on Creative Strengths

		SS	df	MS	F	Sig.	Partial Eta Squared	Observed Power
Abstractness of Titles	Between Groups	5042.496	2	2521.248	2.045	.134	.035	.414
	Within Groups	139333.066	113	1233.036				
	Total	144375.563	115					
Creative Strengths	Between Groups	65.902	2	32.951	2.514	.085	.043	.495
	Within Groups	1481.160	113	13.108				
	Total	1547.062	115					

Gender Differences on the Relationship between Bilingualism and the Separate Creative Abilities

As the descriptive statistics results reported on Table 4.30, females had higher averages of Abstractness of Titles ($M= 90.676$, $SD=37.869$) than males ($M= 75.830$, $SD=28.646$). Female participants also had higher averages and smaller standard deviations ($M= 9.138$, $SD=3.490$) of the scores on Creative Strengths than male participants ($M= 8.291$, $SD=3.903$). Additionally, the female group had more balanced bilinguals with higher means than the male group.

Multiple independent sample t-tests were implemented to examine gender differences in Abstractness of Titles and Creative Strengths. The result of multiple independent sample t-tests was reported on Table 4.31. It indicated significant gender differences on the Abstractness of Titles ($t(112)= -2.293$, $p=. 024$; effect size $r= .045$), while there were no gender effects on Creative strengths ($t(112)= -1.219$, $p=. 225$).

Table 4.30

Descriptive Statistics for Gender on Abstractness of Titles and on Creative Strengths

		Gender					
		Male			Female		
		N	M	SD	N	M	SD
Abstractness of Titles	Monolingual	7	50.1429	22.92327	3	90.0000	37.51000
	Non-balanced bilingual	28	78.6473	30.49781	26	93.3846	27.52174
	Balanced bilingual	14	83.0402	20.67383	36	88.7778	44.62870
	Total	49	75.8304	28.64698	65	90.6769	37.86947
Creative Strengths	Monolingual	7	5.4286	3.20713	3	8.3333	5.03322
	Non-balanced bilingual	28	8.8037	3.98164	26	9.0769	3.32172
	Balanced bilingual	14	8.6966	3.66661	36	9.2500	3.58867
	Total	49	8.2910	3.90392	65	9.1385	3.49051

To examine gender differences on the pattern of relationships between the separate abilities of TTCT and the degree of bilingualism, a Pearson correlation was conducted for males and females separately. The significant correlation coefficient was found between Abstractness of Titles and the WAT for males ($r = -.303, p < .05$). As results of the correlation showed, male participants had stronger correlation coefficients on both subscales of the TTCT than female participants. Although females did not have significant relationships between Abstractness of Titles and the WAT, these subscales of TTCT were inversely related to the WAT for both genders.

The Analysis of Covariance (ANCOVA) of Abstractness of Titles was conducted to examine the gender effects on the relationship between Abstractness of Titles and the WAT by controlling the effect of bilingualism. The ANCOVA results reported non-significant gender effects on Abstractness of Title ($F=1.033, p= .312$), when the effect of bilingualism was partial out on Abstractness of Titles. However, the scores of WAT were significantly

Table 4.31

Independent Samples t-Test for Gender on Abstractness of Titles and on Creative Strengths

	T	df	Sig. (2-tailed)	Mean Squared	Partial Eta Power	Observed
Abstractness of Titles	-2.293	112	.024	-14.84657	.045	.623
Creative Strengths	-1.219	112	.225	-.84751	.013	.227

Table 4.32

Correlation between the Bilingualism and Abstractness of Titles and Creative Strengths

	Gender	
	Male	Female
	WAT	WAT
Abstractness of Titles	-.303*	-.138
Creative Strengths	-.280	-.203

* Correlation is significant at the 0.05 level (2-tailed).

related to the scores of Abstractness of Titles ($F=4.380$, $p= .039$; effect size $r= .038$). The interaction between gender and the scores of WAT were not significant on Abstractness of Titles ($F=.037$, $p= .847$). Consequently, there was not significant evidence to support gender differences on the relationship between the scores of WAT and the scores of Abstractness of Titles within the participants in this study.

Age Differences on the Relationship between Degrees of Bilingualism and the Separate Creative Abilities

On the correlation Table 4.34, there were no significant relationships between the participants' ages and the Abstractness of Titles ($r = .004$, $p > .05$) or on the Creative Strengths ($r = -.030$, $p > .05$). The age was inversely related to Creative Strengths but it was close to zero. As Table 4.16 reported, there were also no significant relationships between age and the scores of the WAT.

Table 4.33

The Analysis of Covariance of Abstractness of Titles

	SS	df	MS	F	Sig.	Partial Eta Squared	Observed Power
Gender	1181.278	1	1181.278	1.033	.312	.009	.172
WAT	5008.831	1	5008.831	4.380	.039	.038	.546
Gender \times WAT	42.883	1	42.883	.037	.847	.000	.054
Error	125794.701	110	1143.588				
Total	947385.074	114					

R Squared = .732 (Adjusted R Squared = -.263).

Table 4.34

Correlations between Age and Two Separate Creative Abilities

	Age
Abstractness of Titles	.004
Creative Strengths	-.030

Consequently, there was no evidence that the participants' ages influenced the relationship between the WAT scores and Abstractness of Titles scores in this study.

CHAPTER 5

DISCUSSIONS

Asian American students has been described as a model minority, successful minorities who have achieved upward social mobility in various contexts through their diligence and determination (Wong & Halgin, 2006; Wong Fillmore, 1991). Their educational aspiration and academic success have been even more highly emphasized (Xin, 2004). However, labeling Asian American students as the model minority provides an excuse for schools or policy makers to avoid addressing their social, psychological and educational needs. In this study, I found interactions of aspects of abilities and needs with genders and ages in Korean American students. These variables included different language use, different cultures, and differences in creativity needed to deal with their complex situations other than imposed academic success in schools.

In this study, positive relationships between bilingualism and creativity were found among Korean American participants regardless of their genders and ages. Specifically, this discussion of the results of this study included the positive relationship between the degrees of bilingualism and overall creativity, creative styles, and separate creative abilities. This study also provided information regarding how Korean American participants' gender and ages play a role in the observed relationship between the degrees of bilingualism and creativity that were measured.

The Relationship between Bilingualism and Total Score of Creativity
(Creative Index on TTCT)

In this study, the degrees of bilingualism were positively related to overall creativity. The students who were highly balanced bilinguals tended to be more creative. The negative correlation coefficient between the scores of the WAT and those of Creative Index on the TTCT indicated that a higher level of bilingualism consistently related to a higher level of creativity because lower scores on both bilingualism measures, WAT and SSR, represented a higher balance between two languages, English and Korean. Both of the measures of bilingualism showed a slightly negative correlation with the total score of the creativity measure. In this study, two different types of tests, including the Word Association Test (WAT) and the Subjective Self Rating (SSR), were used to measure participants' bilingualism. The WAT is a type of test that counts students' right answer on each stimulus word while the SSR is a type of test that reports a participant's degree of confidence in his/her language skills. Therefore, these two bilingualism tests measured participants' degrees of bilingualism with different points of view. The moderate correlation ($r = .369, p < .01$) between the WAT and the SSR supported their different approaches to quantifying the degrees of bilingualism, although they measured the same construct, the degrees of bilingualism. However, the SSR was excluded because it failed to show a significant correlation with the creativity measure, the Torrance Test of Creative Thinking (TTCT). The low and non-significant correlation of the SSR with the Creative Index of TTCT ($r = -.035, p < .05$) can be explained by the characteristic of rating scale that the SSR used. The SSR included four rating scales so that it yielded a smaller range of score (Range=0 – 39.13) and a smaller variation (SD= 9,923) among participants than those of the WAT (Range=0 – 100, $SD = 22.764$). The correlation between the WAT and Creative Index was significant ($r = -.191, p < .05$)

The test administration factors or participants' psychological factors might also be involved in the low correlation between the WAT and Creative Index. The three tests, including the WAT, SSR, and TTCT, were conducted in disruptive conditions including the huge cafeteria at the Korean American school. Moreover, the participants' psychological factors such as motivation might have influenced their test scores. Motivation is an important factor in individual's performance (Brookhart, Walsh, & Zientarski, 2006). However, in this study, each student's parents decided their child's participation. The parents' needs for testing their children were the primary factors that made the participants take those three tests. In addition, there were no external rewards such as a high grade or selection for the gifted program that could encourage participants to put effort on the tests. External motivation can influence students' achievement on a test (Black, Harrison, Lee, Marshall, & Wiliam, 2004). The lack of external motivation might cause low gains on those tests and low correlation between the degrees of bilingualism and creativity.

Under these disruptive and less motivating circumstances, the participants might have found it hard to do their best on the tests. Therefore, the significant correlation between the degrees of bilingualism and the Creative Index can confirm the positive relationship between them. Moreover, positive relationships were also found regardless of types of bilingualism measures. Both measures of bilingualism, WAT and SSR, were inversely correlated with the Creative Index. This positive relationship between the degrees of bilingualism and creativity supported previous research findings (Karapetsas & Andereou, 1999; Konaka, 1997a; Palaniappan, 1993; Spanakos, 2002). Bialystok (2005) stated that bilingualism might have effects on specific cognitive processes rather than on domains of skill development.

The descriptive statistics for bilingualism on the Creative Index indicated that participants who were closer to being balanced bilinguals had higher creativity. Specifically,

balanced bilinguals showed the highest mean score on the Creative Index with the least variability among the language use groups, including bilinguals, non-bilinguals, and monolinguals. Non-balanced bilinguals had higher mean scores than monolinguals.

However, this study's results fail to prove balanced bilinguals' significant superiority to other groups on the Creative Index. This might be due, in part, to the breakdown of individual bilingualism with cutoff scores that were previously assigned to each bilingual group. The administration factors or motivation might interfere with measuring the participants' interaction between their degrees of bilingualism and divergent thinking ability.

Gender Differences on the Relationship between Bilingualism and Total Score of Creativity

Gender differences were found in the degrees of bilingualism. The male group had a higher average score ($M=31.959$) on the WAT than the female group ($M= 21.327$). However, the female group seemed to be more balanced on their two languages than the male group. The female group had more students who could speak at least two different languages (balanced bilinguals and non-balanced bilinguals) than the male group. Furthermore, within the same bilingual group, females were more balanced in their two languages than their male counterparts. For example, the females had lower average balanced scores on the WAT ($M= 21.327$) than the males ($M= 31.959$). Even in the monolingual group, females ($M=56.583$) were closer to the balanced bilinguals than males ($M= 84.942$). Recent research supports this finding (Winter & Pauwels, 2000). According to Winter and Pauwels, females were more likely to attain a second language than males and they also tended to have positive attitudes toward second language acquisition as well as first-language maintenance.

Gender differences were also found on Creative Index scores. The female participants outperformed their male peers on the Creative Index that represents overall creativity. The sample t-test results indicated that gender differences in the degrees of bilingualism and

creativity were significant. However, the females' superiority weakened when their levels of bilingualism were controlled. Previous research for gender differences in creativity was inconclusive. Some research found gender differences in creativity (Dhillon & Mehra, 1987; Kim & Michael, 1995; Richardson, 1986), while other studies did not (Auh, 2000; Konaka, 1997b; Norlander, Erixon, & Archer, 2000; Saeki, Fan, & Van Dusen, 2001). Auh found in his study that musical creativity was not different across genders. Norlander, Erixon and Archer reported that creativity was more favorable to androgyny than stereotypic gender roles.

The scores of the WAT and Creative Index were inversely correlated for both male and female groups. However, none of the correlation coefficients were significant. Although participants in this study had non-significant and low correlations, the negative correlation coefficient between the average score of the WAT and Creative Index indicated that positive relationships existed across genders. Gender differences were not found in the pattern of the relationship between the degrees of bilingualism and overall creativity in this study.

The ANCOVA results indicated that the significant gender differences on the Creative Index scores were not significant when participants' degrees of bilingualism were controlled. As noted above, the female group had more bilinguals with higher mean scores than the male group. Thus, it could be inferred that their high degrees of bilingualism might influence their overall creativity because of the two abilities' positive relationship proven in the previous analysis. ANCOVA results also indicated that there were no gender effects in the relationship between the degrees of bilingualism and overall creativity with a non-significant gender and bilingualism interaction on overall creativity. This indicated that the same patterns of association between the degrees of bilingualism and creativity existed for both females

and males. It also indicated no gender effect on the relationship between the degrees of bilingualism and creativity.

Age Differences on the Relationship between Degrees of Bilingualism and Total Score of Creativity (Creative Index on the TTCT)

In this study, significant age effects were not found on either the degrees of bilingualism or overall creativity. Although the correlation coefficient ($r = -.003, p > .05$) indicated a negative correlation between creativity and age, the relationship was almost zero. Previous research showed inconsistency regarding how creativity is related to age (Wu, Cheng, Ip, & McBride-Chang, 2005). For example, Smith and Carleson (1983) found a positive age effect on participants' artistic creativity. However, a slump in creativity across all ages was reported in Runco's studies (1989, 1991). Some studies found a nonlinear developmental trend in creativity (Smolucha, 1985, Parisier & van den Berg, 1995). Wu, Cheng, Ip, and McBride-Chang found that the age factor was related to the type of creative task rather than creativity itself. Sixth grade students attained high levels of achievement on figural creative tasks, while university students attained high levels of achievement on verbal creative tasks.

In this study, participants' ages also did not play a role in their degrees of bilingualism. Although a positive relationship between age and the degrees of bilingualism was reported, it was low and not significant ($r = -.093, p > .05$). The degrees of bilingualism seemed to relate to the participants' length of exposure to language contexts rather than their ages. For example, the balanced bilinguals in this study tended to stay longer in Korea or attend more years in a Korean school than others. This indicated that the years participants spent in two different language contexts influenced their bilingualism more than their ages.

To summarize, in this study, a positive correlation between the degrees of bilingualism and the total score of creativity on TTCT was found. However, the gender and age factors were not significant to the relationship.

Relationship between the Degrees of Bilingualism and the Creative Styles
(Innovative Creativity and Adaptive Creativity)

In this study, the degrees of bilingualism were related only to Adaptive creativity. However, a negative correlation coefficient of both creative styles, Adaptive creativity and Innovative creativity, with both bilingualism measures, the WAT and the SSR, indicated that creativity was positively related to the degrees of bilingualism regardless of participants' creativity preferences.

The creative process is multidimensional and dependent on personal characteristics and environmental conditions. The use of language may affect one's creativity because language is the medium for delivering one's way of thinking (Fleith, 2002). Each individual can be creative to some degree and has a relative preference in approaching to solving problems that is independent of his or her creative ability (Shiomi & Loo, 1999). Adaptors are individuals who seek to solve problems within existing structures or contexts, focusing on reliability or workability rather than on producing different ideas. However, innovators are individuals who seek to change patterns as part of their solutions (Kirton, 1999).

In this study, the degree of bilingualism's effects on creative styles was investigated. Innovative creativity included Fluency and Originality on TTCT, while Adaptive creativity included Elaboration and Abstractness of Titles. Positive relationships between the degrees of bilingualism and Innovative style and Adaptive creativity were found. However, only the Adaptive style was significantly related to the degrees of bilingualism ($r = -.187, p < .05$). The participants who were closer to balanced bilinguals tended to be more like adaptors

in their creativity. Furthermore, the balanced bilinguals and non-balanced bilinguals outperformed monolinguals on Adaptive creativity. This indicated that bilinguals more highly preferred Adaptive creativity than their monolingual counterparts.

This positive association of the degrees of bilingualism with Adaptive creativity can be explained by characteristics of bilingualism and empirical findings in bilingualism. Current research on the organization of two languages in the mind of bilinguals agreed that both the first and second language remain active during language processing in either language (Bialystok, Kroll, & de Groot, 2005). The sharing process indicated an interaction between two different languages. Psycholinguistic models agree that lexical representations were connected through a common conceptual system (van Hell, 1998). Higher levels of proficiency in the second language produce lexical-semantic configurations that more closely resemble those constructed in the first language. This research supported the idea that shared representations were mutually active during processing in either language. Each of a bilingual's two languages can be described on a continuum of activation in specific context rather than as independently separate matter (Grosjean, 1997). However, if two languages are mutually active and share common representation reigns, then a mechanism is required to keep them functionally distinct. Without procedures for separating the two languages, any use of one language may evoke unwanted intrusions from the other. Bialystok, Kroll, & de Groot addressed this issue of inhibitory control. Price, Green, & von Studnitz (1999) also stated that inhabitation is the primary mechanism for negotiating the language used in specific contexts. Therefore, each of a bilingual's two languages interacts through a continuum of activation in a specific context rather than through a binary switch from one to another. Under this circumstance, a bilingual tends to try to make a decision in the use of his or

her two languages, focusing on finding a solution within existing language processes to make things fit better in a specific context.

Gender Differences on the Relationship between Bilingualism and the Creative Styles

Independent t-test results indicated that there were gender differences in Adaptive creativity. Females were more adaptively creative ($M = 96.484$) than males ($M = 84.603$) in this study. The female group included more balanced bilinguals who had higher Adaptive creativity scores than the male group. Although females were closer to balanced bilinguals and more Adaptively creative than males, the relationship between their degrees of bilingualism and their Adaptive creativity was less clear than that of males. Within the female group, the non-balanced bilingual group performed best on Adaptive creativity. The correlation between the degrees of bilingualism and Adaptive creativity was significant only for males. Within the male group, the balanced bilingual group had the highest attainment on Adaptive creativity. Non-balanced bilinguals were more Adaptive than monolinguals.

However, the relationship between bilingualism and Adaptive creativity for the male group was weakened when participants' degrees of bilingualism effects were controlled to examine pure gender effects on the relationship. Additionally, the pattern of association between the degrees of bilingualism and Adaptive creativity was not different for males and females. There was no gender and bilingualism interaction on Adaptive creativity: a positive correlation was reported across genders. Consequently, gender was not a significant factor in the relationship between the degrees of the bilingualism and Adaptive creativity.

Age Differences on the Relationship between Degrees of Bilingualism and the Creative Styles

Participants' ages were positively correlated with scores on the WAT ($r = .093, p > .05$), but were negatively correlated with Adaptive creativity ($r = -.052, p > .05$). However,

the scores were very low and none of them were significant. This indicated that there were no developmental effects on bilingualism and Adaptive creativity or on their relationship.

The Relationship between the Degrees of Bilingualism and Separate Creative Abilities

(Subscale Scores on TTCT)

Creativity is a multifaceted phenomenon, derived from the interaction of various elements, including person, process, product, and environment. Creativity can be described as a complex process of those factors (Wechsler, 2006). The culture and language use may influence one's creativity. Bilingualism carries a psychosocial dimension that can affect a speaker. The language used in a culture or a society is instrumental to deliver the concept of the culture of society (Bialystok, 2001). Thus, cultural and social circumstances of life play a critical role in how children develop both linguistic and cognitive ability. Bilingualism does not only describe someone who is proficient in two languages. Linguistic characteristics are also markers for important social categories (Bochner, 1996). Creativity can be expressed in different ways within different cultures because each culture encourages a creativity on which it places value (Wechsler, 2006). Asian American students who have two different cultures, including American and Korean, might express their creativity differently from other ethnic groups, and their bilingualism might reflect their culture.

The Asian American participants in this study had a positive relationship between their degrees of bilingualism and Abstractness of Title ($r = -.213, p < .05$), and Creative Strengths ($r = -.250, p < .05$) among separate creative abilities on the TTCT, including Fluency, Flexibility, Elaboration, and Resistance to Premature Closure. Specifically, the balanced bilingual group and the non-balanced bilingual group reported higher scores on Abstractness of Titles than the monolingual group, and balanced bilinguals reported the highest scores on Creative Strengths among the language groups. The strongest correlation

was found with Creative Strengths. The Creative Strengths is the best predictor of one's creativity and it represents 13 different creative characteristics (Wechsler, 2006). It can be the most powerful subscale of the TTCT. Therefore, there was no doubt that Creative Strengths might be most significantly related to the degrees of bilingualism. In this study, evidence of a positive association between creativity and the degrees of bilingualism was found. It is also reasonable to assume that the degrees of bilingualism positively related to Abstractness of Title can be described as an ability to express degrees beyond labeling or to highlight essences by using words (Torrance & Safter, 1999). The use of words might reflect ways of expressing creativity.

Gender Differences on the Relationship between Bilingualism and the Separate Creative Abilities

In this study, females were more creative in terms of Abstractness of Titles. The non-significant gender differences in Creative Strengths might be caused by the scoring process of Creative Strengths: using raw scores with the range 0-2 per item generated less variation than cases using standardized scores. According to Kim (2006), the Abstractness of Titles was negatively related to Confucianism that is dominant in Eastern cultures, including Korea. The Confucian society forces females to be inferior, submissive, more constrained, and lower in autonomy than males (Condon, 1991; Lebra, 1984). The Asian American participants in this study had been raised in the American culture. They spent most of their time in American school systems that valued individual characteristics with fewer gender stereotypical perceptions than in Korean society, and also had access to American resources, including books and television programs. Thus, the participants in this study, although they preserved their Korean cultures, were Americanized. Additionally, their bilingualism might influence their way of thinking. The language one speaks might reflect the culture of the individual,

and the structure of a particular language influences the way speakers know themselves and understand the world around them (Madoc-Jones, 2004). Speaking English might affect Asian American participants' ways of thinking and make them different from their Korean peers. However, the gender differences on Abstractness of Titles were gone after controlling the effects of their degrees of bilingualism.

The male participants showed significantly positive relationships between their degrees of bilingualism and Abstractness of Titles ($r = .303, p < .05$). Although female participants outperformed males on the creativity and had more balanced bilinguals, they failed to show significantly positive relationships between the degrees of bilingualism and Abstractness of Titles. Additionally, a positive relationship was found for both females and males regardless of their statistical significance. ANVOVA results supported no gender effects on the relationship between the degrees of bilingualism and Abstractness of Titles among the participants in this study.

Age Differences on the Relationship between Degrees of Bilingualism and the Separate Creative Abilities

In this study, participants' ages did not significantly relate to either Abstractness of Titles or Creative Strength. Although the age factor was negatively related to Creative Strength, it was close to zero and non significant ($r = -.030, p > .05$). Consequently, participants' ages did not affect the way the degrees of bilingualism associate with separate creative abilities in any direction.

In summary, the degrees of bilingualism were positively related to two creative abilities, Abstractness of Titles and Creative Strengths, among the six separate creative abilities. Gender was not the factor that influenced the relationship. The relationship was not changed depending participants ages.

Implications

In the present study, participants were selected from within a homogenous group: Korean Americans. The majority of previous studies reported that there is a positive relationship between bilingualism and creativity (Baker, 1996; Lemmon & Goggin, 1989; Ricciardelli, 1992). However, these studies have methodological limitations and deficiencies that need to be taken into consideration to ensure a fair judgment (Baker, 1996). A comparison between bilinguals and monolinguals created some biased results due to an uncontrolled cultural effect on creativity. According to Diaz (1985), if bilingualism fosters the development of cognitive abilities, a positive relationship between the degrees of bilingualism and such abilities should be examined within a bilingual sample, but that has rarely been done. Selecting participants from a homogenous group, Korean Americans, helped to find the true effects of the degrees of bilingualism on creativity by controlling the effects of culture.

An individual's creativity is very sensitive to the cultural atmosphere he or she has experienced (Davis, 1998). Fleith (2002) stated that a language could shape creativity as a vehicle of culture. This study revealed real aspects of Korean Americans under complex bilingual contexts beyond the model minority image.

Many researchers have agreed that the cross-validation and replication of their studies are necessary to generalize their findings (Karapetsas & Andereou, 1999; Konaka, 1997a; Palaniappan, 1993; Spanakos, 2002). This study confirmed the validated findings of previous research, which reported a positive relationship between bilingualism and creativity.

This study also provided information about each student's degree of bilingualism. With this information, the true relationships between bilingualism and creativity were tested. The degrees of bilingualism involved critical differences in creativity.

This study found a pattern of association between bilingualism and creative styles. This information can help educators understand Korean Americans' real aspects of creativity, including creativity preference, and develop appropriate programs that enhance Korean American students' creativity. In addition, it can provide a more realistic view of Asian Americans as individuals with various strengths, including creativity.

Finally, this study provided information about a developmental effect on the relationship between degrees of bilingualism and creativity. The finding indicated that age was not a factor, so educators or parents who work with bilingual students should provide appropriate support to enhance their students' creativity or bilingualism. Under supportive circumstances, it can be expected that the degrees of bilingualism may also positively relate to creativity. It will also help educators make decisions supporting the needs of Korean American students in terms of their creativity and bilingualism.

Furthermore, findings about the beneficial effects of second language learning on cognitive abilities may strengthen the argument for including second language learning in the elementary curriculum of the nation's schools. This can be benefit all students.

This study's findings may provide recommendations for educators who work with Asian American students who use dual languages and are situated in the interaction between two different cultures. The educators should recognize the diversity among Asian American students, including their different level of use of languages, different creative preference, and even different creative abilities. The educators should provide appropriate supports to meet the various needs of Asian American students academically and psychologically beyond the exaggerated and over-specified model minority image of Asian American students.

Limitationss

Because all participants in this study were selected from a private Saturday school in Atlanta that requires extra tuition payment from parents, the participants might come from all around the Atlanta area and have various socioeconomic status differences among their residences. Thus, this study will not perfectly control the socioeconomic status of all participants, which may be a possible limitation.

As Baker (1996) stated, when a child's second language competence is similar to his or her first language competence, cognitive benefits may accrue. He explained the difference between balanced and non-balanced bilinguals as a threshold. In the study, the creative differences among bilingual groups, including monolinguals, non-balanced bilinguals, and balanced bilinguals, were not reported. The specific group comparisons based on threshold could not be explained.

There may also be limitations on making an inference that could be generalized to the entire Korean American population. The participants for this study were selected from one Korean American school in Atlanta. Although it is the largest Korean American school in this area, it is not fully representative of the Korean American population.

Ethnicity may be another limitation of this study. Only one ethnic group, Korean Americans, was used in this study. Asian Americans categorize themselves into four sub-groups: Korean, Asian, Asian New Wave, and Asian American. Members of each of the four identity groups generally keep their own unique ethnic perspective and rarely socialize with individuals from other groups (Lee, 1994). Therefore, generalization of the results of this study to the whole Asian American population is restricted. It is necessary to compare different ethnic groups in terms of their relationships between bilingualism and creative thinking

ability because each ethnic group has its own cultural background that could influence the creative thinking ability of its members.

Also, the sample was small for so many analyses, and the monolingual group was especially small.

Future study

In this study, I failed to compare two different language dominant groups, including Korean dominant group and English dominant group because most of the participants were categorized as English dominant group. However, the two different languages might affect the participants' creativity in their own ways. Thus, comparing two different language dominant groups within homogenous participants would provide accurate information about the relationship of bilingualism and creativity.

Most previous studies investigated the relation between bilingualism and creativity by using creativity as a dependent variable. A positive relationship between bilingualism and creativity was found, but studies have not provided any information about the causality between these two different abilities. Thus, the question still remains as to how an individual's creativity can affect his or her bilingualism. This question needs further research in the future.

Another question that should be considered in further research is whether the relationship between bilingualism on creativity are permanent or weaken as time goes by. In this study, participants' ages did not significantly affect the positive relationship between bilingualism and creativity. Using longitudinal data in the future may clearly reveal the developmental effects on the relationship between bilingualism and creativity by controlling factors that influence these two different abilities and their relationship.

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APPENDIX A

MINOR ASSENT FORM

Dear Participant,

You are invited to participate in my research project titled, "**The relationship between bilingualism and creativity of Korean-Americans.**" Through this project I am finding out how one's bilingualism may affect one's creativity and creative style.

If you decide to be part of this, you will be given three activities of a Word Association Test, a Self Rating Scale and a Thinking Creatively with Picture, which will altogether take a total of 75 minutes to complete during class time. You will have three tests to complete. Your participation in this project will not affect your grades in school. I will not use your name on any papers that I write about this project. However, because of your participation you may improve your understanding of how speaking two languages affects creativity. I hope to learn something about how speaking two languages affects creativity and different creative style that will help other bilingual children in the future.

If you want to stop participating in this project, you are free to do so at any time. You can also choose not to answer questions that you don't want to answer.

If you have any questions or concerns you can always ask me or call my teacher, Dr. Bonnie Cramond at the following number: 706-542-4248.

Sincerely,

Hang Eun Lee

**Department Of Educational Psychology And Instructional Technology at the
University of Georgia**

Contact Information 678-443-9874

I understand the project described above. My questions have been answered and I agree to participate in this project. I have received a copy of this form.

Signature of the Participant/Date

Please sign both copies, keep one and return one to the researcher.

Additional questions or problems regarding your rights as a research participant should be addressed to The Chairperson, Institutional Review Board, University of Georgia, 612 Boyd Graduate Studies Research Center, Athens, Georgia 30602-7411; Telephone (706) 542-3199; E-Mail Address IRB@uga.edu.

APPENDIX B

미성년 동의서 (KOREAN VERSION)

연구 참가자분께,

귀하는 "재미 한국 학생들의 이중언어와 창의성 관계에 관한 연구"에 초대 되셨습니다. 이 연구를 통해 연구자는 개인의 이중언어성이 창의성과 창의성 스타일에 어떠한 영향을 미치는지 연구하고자 합니다.

만일 귀하가 연구 참여에 동의 하신다면, 귀하는 연구자에게 3가지 검사지, Word Association Test, the Self Rating Scale and Torrance Test of Creative Thinking, 로 귀하를 검사하고 그 결과를 사용할 권한을 허락하십니다. 검사는 모두 75분이 소요됩니다. 귀하의 연구참여는 귀하의 학교 성적에 영향을 미치지 않을 것입니다. 연구자는 이 연구에 관련된 서면에 귀하의 실명을 사용하지 않을 것입니다. 그러나, 이 연구에 참여함으로써 인해 귀하는 두 언어의 사용이 창의성과 각각 다른 창의성 스타일에 어떻게 영향을 미치는가에 대한 포괄적인 이해를 구하게 될 것 입니다. 이를 통해 연구자는 창의성에 대한 두 가지 언어사용의 영향에 관해 정보를 수집해 보다 나은 이중언어 교육을 위해 사용 할 것 입니다.

만일 귀하가 연구 참여를 중단 하시기를 원하신다면, 어느때라도 연구참여를 중단할 수 있습니다. 또한 귀하는 답변하기 원하지 않는 질문에 대해 답변하지 않을 수 있습니다.

만일 질문이나 궁금한 사안이 있으시면 연구자 또는 지도교수, Dr. Bonnie Cramond,에게 다음 번호로 연락 할 수 있습니다 706-542-4248.

Sincerely,

Hang Eun Lee

Department Of Educational Psychology And Instructional Technology at the
University of Georgia

Contact Information 678-443-9874

나는 위에 기술된 연구에 관한 사안들을 이해 합니다. 내 질문은 답변될 것이며 나는 이
연구 참여에 동의 합니다. 나는 이 동의서의 복사본을 보관 할 것입니다

Signature of the Participant/Date

서명 후 한 부는 보관하시고 원본은 연구자에게 제출해 주십시오.

귀하의 연구 참여자로서의 권리에 대해 궁금하신 점이나 문제점이 있으시면 The Chair-
person, Institutional Review Board, University of Georgia, 612 Boyd Graduate Studies
Research Center, Athens, Georgia 30602-7411; Telephone (706) 542-3199; E-Mail Address
IRB@uga.edu 로 연락주십시오.

APPENDIX C

PARENTAL PERMISSION FORM

I agree to allow my child, _____, to take part in a research study titled, "The relationship between bilingualism and creativity of Korean-Americans" which is being conducted by Hang Eun Lee from the Department Of Educational Psychology And Instructional Technology at the University of Georgia (678-443-9874) under the direction of Dr. Bonnie Cramond, Department Of Educational Psychology And Instructional Technology at the University of Georgia (706-542-4248). Participation in this research project is voluntary. I can refuse to allow my child to participate and can withdrawal my child from participation without any penalty or any loss of benefits to which he or she is otherwise entitles. Even if I give permission for my child to participate, my child is free to refuse to participate and may end participation at any time. I can request to have the results of the participation, to the extent that it can be identified as my child's, removed from the research records or destroyed. My child's grade, status in the class, or relationship with his/her teacher will not be affected if she/he does not to participate or if decide to stop taking part.

- The reason for the study is to find out if one's bilingualism may affect his/her creativity.
- Children who take part may gain an understanding of how speaking two language effects creativity. The researcher will send the parents a report of the test results with a concise explanation of what they mean. The reports will be carefully written with the assistance of Dr. Cramond, to emphasize area of strength and provide suggestion

for ways to improve bilingualism and creativity. Any parents who request additional information or explanation will be accommodated.

- Three tests will be administered by the researcher during the special class time that provides creative activities including dance, arts and Korean martial arts for Korean students with one week interval: In the first week, bilingualism tests including The Word Association Test and the Self Rating Scale will be conducted during 40 minutes of special class time. In the second week, The Torrance Tests of Creative-Figural will be conducted for 40 minutes of special class time. Participants' missing special class can be compensated by being participated in this creative research, including measuring their creativity and bilingualism and having understanding of relationship between them.
- The students who are not participating will stay in their special class while the students who have permission from parents are completing the instruments in a cafeteria during the special class.
- If I allow my child to take part, my child will be asked to complete three different instruments for measuring his/her level of bilingualism and one for measuring his/her creativity, during special class time.
- The research is not expected to cause any harm or discomfort.
- All individually identifying information collected about my child will be held confidential unless otherwise required by law. My child's identity will be coded, and all data will be kept in a secured location.
- The researcher will answer any questions about the research, now or during the course of the project, and can be reached by telephone at: 678 443 9874. I may also contact the

professor supervising the research, Dr. Bonnie Cramond, Department Of Educational Psychology And Instructional Technology at the University of Georgia (706-542-4248).

- I understand the study procedures described above. My questions have been answered to my satisfaction, and I agree to allow my child to take part in this study. I have been given a copy of this form to keep.

Name of Researcher	Signature	Date
Telephone: 678-431-6305		
Email: helee@uga.edu		

Name of Parent or Guardian	Signature	Date

Please sign both copies, keep one and return one to the researcher.

Additional questions or problems regarding your child's rights as a research participant should be addressed to The Chairperson, Institutional Review Board, University of Georgia, 612 Boyd Graduate Studies Research Center, Athens, Georgia 30602-7411; Telephone (706) 542-3199; E-Mail Address IRB@uga.edu.

APPENDIX D

부모님 동의서 (KOREAN VERSION)

나는 내 자녀, _____ (한글학교 반)가 Dr. Cramond 교수, Department Of Educational Psychology And Instructional Technology at the University of Georgia (706-542-4248)의 지도하에 이 행은, The Department Of Educational Psychology And Instructional Technology at the University of Georgia (678-443-9874), 이 행하는 연구 ” 재미 한인 학생들의 이중언어와 창의성에 대한 관계”에 참여하는 것을 동의 합니다. 나는 만일 내가 원하지 않으면 아무런 불이익 없이 내 아이의 참여를 허락하지 않을 권한이 있습니다. 내 아이는시기와 상관없이어떠한 이유에서 라도 불이익 없이 참여를 중단 할 수 있습니다. 나는 내아이와 관련된 정보에 한해서 정보를 요구할 권한을 가지며, 연구과정 에서의 삭제 또는 폐기를 요구 할 수 있습니다. 내 자녀는 학점 또는 교사와의 관계에서 어떠한 불 이익 없이 참여를 중단할 수 있습니다.

- 연구목적: 개인의 이중언어선취도의 창의성에 대한 영향을 밝히고자 한다.
- 연구에 참가하는 아동들은 이중언어습들이 그들의 창의성에 어떠한 영향을 주는데 대한 이해할 수 있다.
- 연구자는 정확한 설명과 함께 검사 결과를 학부모들에게 공지 한다. 그 검사결과는 Dr. Cramond의 감수를 받으며 그 아동의 장점 또는 강점을 찾아내고, 그의 이중언어성과 창의성을 향상시킬 수 있는 대안을 제시한다. 학부모는 자녀의 검사결과에 대한 보다 자세한 정보를 요구 할 권한이 있으며, 그 요구는 즉각 수용 될 것이다.

- 3 가지 검사지가 연구자에 의해 한 주간격으로 특활시간에 제공된다. 특활시간은 한국 전통 예술과 태권도등 이 제공된다. The Word Association Test 와 Self Rating Scale 는 첫주 40분 특활시간동안 측정된다. 두번째 주에는 The Torrance Tests of Creative-Figural 이 40분 특활시간동안 측정된다. 참여자들은 창의성 연구에 참여 그리고 이중 언어성에 대한 이해를 통해 결석한 특활 시간을 보상받게 된다.
- 연구에 참여하지 않는 학생들은 특활시간에 참여한다.
- 연구자가 수집하는 어떤 정보도 익명으로 보호받는다.
- 연구자는 연구에서 어떠한 불이익이나 불편함도 예상하지 않는다.
- 내 아이에 대해 수집된 정보는 법에서 요구하지 않는한 공개되지 않을 것이다. 내 아이는 익명으로 처리되며 모든 정보는 안전한 장소에 보관 될 것이다.
- 연구자는 연구중 어느 시점에서도 질문에 성실히 대답할 것이다 (678 443 9874). 또는 필요 하다면, 나는 이 연구를 지도 하는 Dr. Bonnie Cramond, Department Of Educational Psychology And Instructional Technology at the University of Georgia (706-542-4248) 에게 연락 할 수 있다.
- 나는 이상에서 기술된 연구 과정을 이해하며, 내 자녀의 연구 참여를 동의 한다. 나는 이 동의서의 복사본을 보관한다.

I understand the study procedures described above. My questions have been answered to my satisfaction, and I agree to allow my child to take part in this study. I have been given a copy of this form to keep.

Name of Researcher

Signature

Date

Telephone: 678-431-6305

Email: helee@uga.edu

Name of Parent or Guardian	Signature	Date

서명 후 한 부는 보관하시고 원본은 연구자에게 제출해 주십시오.

자녀의 연구 참여자로서의 권리에 대해 궁금하신 점이나 문제점이 있으시면 The Chairperson, Institutional Review Board, University of Georgia, 612 Boyd Graduate Studies Research Center, Athens, Georgia 30602-7411; Telephone (706) 542-3199; E-Mail Address IRB@uga.edu 로 연락주십시오.

APPENDIX E

SUBJECTIVE SELF-RATING

In question 1 - 8, please circle the word or phrase that applies to you.

1. How well do you understand spoken English? (listening)

Not at all fair well very well

2. How well do you speak English?

Not at all fair well very well

3. How well do you read English?

Not at all fair well very well

4. How well do you write English?

Not at all fair well very well

5. How well do you understand spoken Korean? (listening)

Not at all fair well very well

6. How well do you speak Korean?

Not at all fair well very well

7. How well do you read Korean?

Not at all fair well very well

8. How well do you write Korean?

Not at all

fair

well

very well

APPENDIX F

SUBJECTIVE SELF-RATING (KOREAN VERSION)

질문 1-8 대해 자신에 해당하는 항목에 동그라미 하세요.

- | | | | | |
|---------------------------------------|--------|------|------|---------|
| 1. 영어를 얼마나 잘 듣고 이해 하십니까 (Listening)? | 전혀 못한다 | 보통이다 | 잘 한다 | 아주 잘 한다 |
| 2. 영어로 얼마나 잘 말 할 수 있으십니까? (Speaking) | 전혀 못한다 | 보통이다 | 잘 한다 | 아주 잘 한다 |
| 3. 영어를 얼마나 잘 읽을 수 있으십니까? (Reading) | 전혀 못한다 | 보통이다 | 잘 한다 | 아주 잘 한다 |
| 4. 영어로 얼마나 잘 쓸 수 있으십니까? (Writing) | 전혀 못한다 | 보통이다 | 잘 한다 | 아주 잘 한다 |
| 5. 한국어를 얼마나 잘 듣고 이해 하십니까 (Listening)? | 전혀 못한다 | 보통이다 | 잘 한다 | 아주 잘 한다 |
| 6. 한국어를 얼마나 잘 말 할 수 있으십니까(Speaking)? | 전혀 못한다 | 보통이다 | 잘 한다 | 아주 잘 한다 |
| 7. 한국어를 얼마나 잘 읽을 수 있으십니까? (Reading) | 전혀 못한다 | 보통이다 | 잘 한다 | 아주 잘 한다 |

8. 한국어를 얼마나 잘 쓸 수 있으십니까? (Writing)

전혀 못한다

보통이다

잘 한다

아주 잘 한다

APPENDIX G

BACKGROUND QUESTIONS

Name _____

Age _____, Gender _____

Father's occupation _____, Mother's occupation _____

1. How many years have you been U.S.? _____
2. How many years have you been Korea? _____
3. How many years have you attended an American school? _____
4. Do you attend Korean school? _____ (If yes, _____ years)
5. Does your mother mostly speak English? Yes _____, No _____
6. Does your mother mostly speak Korean? Yes _____, No _____
7. Does your mother mostly speak both English and Korean? Yes _____, No _____
8. Does your father mostly speak English? Yes _____, No _____
9. Does your father mostly speak Korean? Yes _____, No _____
10. Does your father speak both English and Korean? Yes _____, No _____

11. Do you have any sibling(s) who can speak Korean? _____

If yes, she is older sister(s) _____ years old

younger sister(s) _____ years old

he is older brother(s) _____ years old

younger brother(s) _____ years old

12. Do you have any sibling(s) who can speak English? _____

If yes, she is older sister(s) _____ years old

younger sister(s) _____ years old

he is older brother(s) _____ years old

younger brother(s) _____ years old

13. Do you watch English TV program? Yes _____, No _____

If yes, _____ hour(s) in a day.

14. Do you watch Korean TV program? Yes _____, No _____

If yes, _____ hour(s) in a day.

15. Do you read English book? Yes _____, No _____

If yes, _____ hour(s) in a day.

16. Do you read Korean book? Yes _____, No _____

If yes, _____ hour(s) in a day.

APPENDIX H

BACKGROUND QUESTIONS (KOREAN VERSION)

성명 _____

나이 _____, 성별 _____

아버지 직업 _____, 어머니 직업 _____

1. 미국에 얼마동안 거주 하셨습니까? _____
2. 한국에 얼마동안 거주 하셨습니다? _____
3. 얼마동안 미국 학교에 다녔습니까? _____ 년
4. 한국 학교에 다닌적이 있으십니까? 예 _____ (_____년), 아니오 _____
5. 어머니가 영어로 대화 하십니까? 예 _____, 아니오 _____
6. 어머니가 한국어로 대화 하십니까? 예 _____, 아니오 _____
7. 어머니가 한국어와 영어로 대화 하십니까? 예 _____, 아니오 _____
8. 아버지가 영어 대화 하십니까? 예 _____, 아니오 _____
9. 아버지가 한국어로 대화 하십니까? 예 _____, 아니오 _____
10. 아버지가 한국어와 영어로 대화 하십니까? 예 _____, 아니오 _____

11. 19. 한국어 또는 영어를 사용하는 형제 또는 자매가 있습니까? _____
만일 '예' 라면, 나는 _____ (나이) 언니(들)가 있습니다.
나는 _____ (나이) 여동생(들)이 있습니다.
나는 _____ (나이) 오빠(들)가 있습니다.
나는 _____ (나이) 남동생(들)이 있습니다
12. 미국 TV를 보십니까? 예 _____, 아니오 _____
만일 '예' 라면, 하루에 _____ 시간 봅니다.
13. 한국 TV를 보십니까? 예 _____, 아니오 _____
만일 '예' 라면, 하루에 _____ 시간 봅니다.
14. 영어 책을 읽으십니까? 예 _____, 아니오 _____
만일 '예' 라면, 하루에 _____ 시간 읽습니다.
15. 한글 책을 읽으십니까? 예 _____, 아니오 _____
만일 '예' 라면, 하루에 _____ 시간 읽습니다.

APPENDIX I

WORD ASSOCIATION TEST

In this test, you will be asked to think of as many words as you can that associate with the given word. In other words, you will be asked to write down as many words as you can think of, in the language of the stimulus (English), which seems to go with or belong with that word. For example, if the word were family, you would write at least some of the words written below.

Family: children brother sister grandmother
 grandfather mother father household

If the word is adjective, you will be asked to write as many words as you can which have the same meaning or similar meaning to the given word

Fine: good beautiful attractive excellent
 polished refine nice choice

You will have 16 minutes for 16 English words. Don't spend too much time on single word. Your score will be the number of correct words that you write

APPENDIX J

WORD ASSOCIATION TEST (KOREAN VERSION)

주어진 단어를 보고 연상되는 단어들을 모두 쓰세요. 주어진 단어가 영어면 영어로만, 한국어면 한국어로만 대답해 주십시오. 예를 들어, 만일 주어진 단어가 Family라면, 아래 보기와 같이 대답하세요.

Family: children brother sister grandmother
 grandfather mother father household

만약 주어진 단어가 형용사 라면 그 단어와 뜻이 같거나 비슷한 말을 쓰세요. 예를들면,

Fine: good beautiful attractive excellent
 polished refine nice choice

시간은 16개 영어단어에 16분이 주어집니다. 한 단어에 시간을 너무 많이 쓰지 마십시오. 점수는 여러분이 쓰신 단어 중 적절한 대답의 수에 따라 정해집니다. 문제 1 - 16번은 영어 부분입니다. 영어로만 대답해 주세요