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An Investigation of the Cognitive and Affective Differences in Japanese and American Mathematically Talented Students

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The apparent higher level of performance of Japanese and Japanese-American students on academic tasks when compared to American students has caused great concern in the American educational system. The purpose of this research project is to examine the cognitive and affective variables related to the performance of mathematically talented children across Japanese and American cultures. The design of the study permits exploration of possible cultural differences in the attainment of academic success.

Male students between the ages of 7 and 12 and representative of three groups, Japanese (n=31), Japanese-American (n=31), and American (n=41), were solicited for participation in this study. Students were requested to complete four research instruments (The Murphy-Meisgeier Type Indicator for Children, The Piers-Harris Self-Concept Scale for Chidlren, The Family Environment Scale, and a Study Habits Survey).

child's self-concept and the student's teacher completed a measure of the student's self-concept.

The results of this investigation suggest that there are differences in some study skills, self-concept, and family environment variables across culture. No differences were noted in thinking style across culture.

AN INVESTIGATION OF THE COGNITIVE AND AFFECTIVE DIFFERENCES IN JAPANESE AND AMERICAN MATHEMATICALLY TALENTED STUDENTS

by

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CHAPTER I

INTRODUCTION

In 1987, the U.S. Department of Education released the results of a two-year study of education in Japan. The impressive accomplishments of the Japanese system were detailed within the report. Other studies, such as Harnisch (1986), Gordon (1987), McKinney (1987), and Burstein and Hawkings (1986), have also reported the phenomenal performance of Japanese students, especially in the fields of mathematics and science. The results of such studies have spawned considerable interest in the popular press. Such accounts, such as those appearing in Simmons (1989) and Adler (1990), have often viewed Japanese success in a rather myopic fashion. For example, many of these accounts have focused on a minute aspect of Japanese culture as being the determining factor in achieving success as demonstrated in Simmons (1989). Simmons appears to attribute the superior performance of Japanese students to the phenomenon known as Kyoiku Mama, or education

mother. Simmons implies that this factor is solely responsible for the success of the Japanese student as opposed to looking at a multi-causal model.

Despite the disparity between the performance of Japanese students and their American counterparts, there appears to be a limited body of comparative research examining differential student characteristics across cultures. Burstein and Hawkings (1986) performed a literature search using ERIC (between 1966 and 1985) and found only 40 citations dealing with Japanese student characteristics. In continuing the search, Burstein and Hawkings used the Social Sciences Citation Index and found only 10 additional citations. As Burnstein and Hawkings (1986) noted, other sources of information, such as those reported in Phi Delta Kappa and Educational Leadership, are often based on informal observations and seldom contain the empirical evidence needed for interpretation of the available information.

As much as Americans admire the performance of Japanese students, they equally admire the performance of Asian-American students. Asian-American students are often referred to as the "model minority".

Frechtling et. al. (1983) reported that there are frequent reports of Asian-American students' high achievement in school. These reports have documented the disproportional numbers of Asian-American students as winners in numerous academic competitions such as the Merit Scholarships and the Westinghouse Talent Search. There are reports indicating a higher enrollment of Asian-American students in the fields of science and engineering. Finally, Asian-American students frequently score higher on than other students, particularly in the areas of mathematics and science (Frechtling et. al.,1983; Harnisch and Ryan, 1986; and Stevenson, 1983).

The higher level of performance of Japanese and Japanese-Americans students compared with American students has caused great concern in the American educational system (Antonapolis, 1985). Because of this, President Bush proclaimed a national goal for American students to place first on international science and mathematics standardized tests by the end of the decade. To help attain these goals, perhaps a greater focus on cross- cultural research can assist us to discover and rediscover the values and practices

that will enhance American literacy. As pointed out in a report prepared by the Laboratory of Comparative Human Cognition (1986), "A small but growing body of data illustrates ways in which cross-cultural psychological research maybe particularly relevant to educational practice." The purpose of the research project to be described here is to examine cognitive and affective variables related to the performance of mathematically talented children across cultures. The design of the study permits exploration of possible cultural differences in the attainment of academic success. "If we could identify particular childrearing and/or pedagological practices in Asian ...cultures which promote resistance to math anxiety, or actually create a preference for mathematical material, then the practical benefits from our technological society might be substantiated. (Mordkowitz, 1986)."

This study is unique in that it controls for subject variability by limiting the study to subjects of high mathematics ability. Past comparisons may have not been accurate due to possible confounded populations. Because the U.S. population may not be as homogenous as Japan's, comparisons of the "average"

student may have been greatly confounded.

Forty one American students, thirty-one Japanese-American, and thirty-one Japanese students participated in this study. All participating students completed a battery of tests (Murphy-Meisgeier Type Indicator for Children, Piers-Harris Children's Self-Concept for Children, Family Environment Scale, and Study Habits Survey). The student's parent completed a measure of the student's self-concept and the student's teacher also completed a measure of the student's self-concept. The research questions to be addresses in the study are as follows:

Are there differences in the styles of learning among Japanese, Japanese-American, and American students?

Are the study habits of Japanese students different from those of Japanese-American and American students?

What is the relationship between family environment and self-concept across cultures?

Are parent and teacher ratings of self-concept similar to student self-reports across cultures?

CHAPTER II

REVIEW OF THE LITERATURE

Although not numerous, there are several different approaches to research that have been attempted to explain the differences in the superior academic performance of Japanese and Japanese-American students. In what follows, a selective discussion of these approaches is presented. First, the literature on family environment is reviewed. Differences in the educational systems are presented in the following section. Next, a discussion of self-concept is offered, where a special focus is given to what we know about the examination of the cultural effects related to self-concept. Finally, learning styles research is systematically reviewed and evaluated.

Family Environment

Research related to Japanese Families

One such approach to studying the differences in academic performance between Japanese and American students is to examine the differences in the family

environment across cultures. As Shon and Ya (1982) suggest, the emphasis in American families is on the single nuclear family, which has a time limited life span. With Asian families, the individual is seen as the product of all generations from the beginning. Personal actions reflect not only on the individual and the nuclear and extended families, but also on all of the preceding generations of the family since the beginning of time (Shon and Ya, 1982).

Much of the research has focused on the relationship of the Japanese mother and child. White (1985), in a micro-analysis of mother-child interactions, reports that Japanese mothers emphasized earlier monitoring of skills which demonstrated "self-control, compliance with adult authority, and social courtesy." American mothers, on the other hand, emphasized "individual action and self assertion." Miyake et.al. (1986) observes that even the physical interaction is markedly different. Japanese mothers are more likely to use "tactile and low intensity vocal expression" than American mothers. Interpersonal space is also maintained differently, with Japanese mothers frequently carrying their infants on their backs rather

than in front of them (Miyake, 1986).

In a study examining maternal teaching techniques, Hess et.al (1986) investigate four maternal teaching variables: request for verbal response, elaboration of child's response, recycling in response to child's error, and directions on regulating child's problem solving. Again marked differences were noted in the teaching style of mothers across culture. First, American mothers were more likely than their counterparts to ask for responses in their attempts to help their children. Japanese mothers were more likely to elaborate instructions in response to incorrect or incorrect answers. American mothers tended to recycle the task instruction. In the interaction, Japanese mothers refer more to feeling as opposed to authority, Finally, American mothers tended to use more commands while Japanese mothers tend to be less direct.

As Hess et.al. (1986) suggest, Japanese mothers tend to be less direct and authority-oriented than American mothers. Japanese researchers tend to relate this to a concept called "amae", which, with no direct English equivalent, means dependency. Miyake et.al.

(1986) describe the process of "amae". Prior to seven months of age, the mother-child relationship is described as being that of "perfect oneness." After seven to eight months of age, the infant starts to become aware of the mother's separate entity. The infant desires to return to this oneness to preserve "amae". Japanese mothers urge "amae" by fostering the self-indulgent tendency to "expect the help and support of individuals and groups close to him or her." Along with this notion, White and Levine (1986) describe the process of "wakaraseru". This is the process of engaging a child in the goals the mother has set, which seem to never go against the child. "Where an American might view this manipulation of the child through indulgence as preventing the development of strong self-will, the Japanese see the long term benefits of self-motivated cooperation. (White and Levine, 1986)." White (1985) points out that except for pathological cases, Japanese mothers do not lose their personal boundaries within the child's personality boundaries. In cases where the mother and child do not share " an emotionally close and mutually cooperative relationship", the battle will be out in the areas of

study and school achievement.

As discussed earlier, Japanese families do not stress the independence and autonomy of the individual but rather that the individual is superseded by the family. This concept is extended to differences in discipline strategies. Halloway (1987) has reported characteristic differences in mother-child interactions across culture. Japanese mothers use control strategies that call attention to the impact on the mother's feelings of the child's behavior while American mothers are more likely to appeal to their own power to gain compliance. Weiscz (1984) reports that Japanese children are taught to value close alignment with family members by threat to the contiguity of that alignment. Often, parents will threaten to lock a child outside the house as opposed to the American practice of "grounding" (Weiscz, 1984). As Weiscz continues, "re-alignment with home and family signifies the end of punishment and the reinstatement of a rewarding state of affairs." In America, the opposite is true. Forced alignment is the punishment and the termination (autonomy from the family) is the reward.

While a great deal of literature is devoted to

examining mother-child interactions, a spot light has been focused on the role of the mother as the facilitator of her child's academic success. The phenomenon is known in Japan as the "kyoiku mama", or the "education mama". The western equivalent of the "kyoiku mama" seems to be that of the "stage mother". In Japan, many women leave their jobs to raise their children, which is viewed as a full time job. Befu (1986) reports the common Japanese perception that a working mother connotes misfortune and often suggests economic necessity. While in the U.S., the opposite appears to be the norm. Occasionally, the Japanese mother will become "over-involved" in her child's academic career in order to help her child to compete in the high pressure educational system. It is for these mothers that the label "kyoiku mama" applies. As White (1985) observes, "sometimes mothers assist their children so actively in the construction of elaborate crafts and homework projects that women joke that the school teacher is really grading the neighborhood mother by proxy." White (1985) further suggests that this is relatively new phenomenon brought on by the competition to get into prestigious schools. Early

observers of Japanese culture, White notes, have not observed such pressure.

The Japanese family structure has remained fairly consistent over generations. However, there is some evidence that the structure is changing. Okado (1987) states that the Japanese family is changing from the extended family to one resembling the nuclear family. Kumagai (1984) reports that the Japanese family cycle has changed drastically and that Japanese women are starting to resemble their American and Canadian counterparts. Japanese women are starting to marry later (late 20's) and many are entering the job fields (Kumagai, 1984). This could have important ramifications for child-rearing practices in Japan.

Research related to Asian-American Families

Another line of research is to examine the influences affecting the performance of Asian-Americans in this country. Asian-Americans, as a whole, have the highest level of college education of any ethnic or racial group in this country (Sue and Abe, 1988). Mordkowitz (1986) states that "one compelling reason to study the influence of Asian culture and educational development is the commonly observed tendency of Asians

and Asian-Americans to do particularly well in mathematics learning." Although there are similarities between Asians here in this country and abroad, Asian-Americans present as a separate entity. Because most studies in this country do not account for the various sub-groups of Asian-Americans, this literature review will look at Asian-American as a whole and will only address the subtle differences for Japanese-Americans when appropriate.

The focus on education is strong for Asian-American parents. Mordkowitz (1986), in a survey of successful Asian-American college students, notes that parents maintained strict control of after school time, often allowing the children to play only one afternoon. "Extrinsic rewards were not used as much as high expectations and socialization of effortful perseverance (Mordkowitz, 1986)." Parent reaction to difficulty is classified into three responses: provide additional resources, instill greater effort, and discontinue outside activities. Another finding of the survey was that Asian-American parents tended not to use baby-sitters and would not give their children freely spendable allowances. Mordkowitz also noted that

Asian-American families tended to have lower verbal activity (i.e. around the dinner table). However, a strong emphasis on non-verbal communication in the Japanese culture is noted (Mordkowitz, 1986).

In taking a different view of the superior academic success of Asian Americans, Sue and Okazaki (1990) have supported the use of what they term the "relative functionalist" approach as opposed the commonly used "cultural theory." They state that high academic achievement cannot solely be attributed to Asian cultural values. Sue and Okazaki (1990) state that "...the educational attainments of Asian Americans are highly influenced by the opportunity present for upward mobility, not only in educational endeavors but also in non-educational areas." Because mobility in non-educational areas is often blocked, advancement and success in educational arenas becomes the main opportunity for advancement. To emphasize this point, Ogba and Matake-Bianchi (1986) report that the level of educational achievement in China is lower than that of Chinese-Americans. This finding is possibly due to the fact that intellectuals are under increased scrutiny, receive inadequate salaries, and find other jobs

financially rewarding.

Sue and Okazaki (1990) state that three issues are important is using relative functionalism as an explanation. Relative functionalism would predict that Asian-American achievement would decrease with acculturation. As Asian-Americans are in this country longer, opportunities would presumably increase. Secondly, this theory would predict that limitations in mobility in the non-educational spheres would increase educational levels. Finally, the question of Asian American perception of limitations in non-educational mobility arises. Sue and Okazaki believe that further empirical study is required to substantiate this approach.

Research related to American Families

As suggested earlier, the focus and interaction style of the American family is much different than that of the Japanese family. In a review with American families, Olszewski, Kulieke, and Buescher, (1987) noted that a majority of identified gifted students (across domain of giftedness) were the eldest in a sibship of two. Family climate also seems to be an important factor in fostering student achievement.

Colangelo (1983) reports that parents of gifted children are more inclined to allow more freedom to children in choosing their friends, making decisions, and to encourage creative interests outside the home. He also reports that the fathers of gifted children tended to be more permissive. Rimm (1988) observed that 95% of her sample of gifted children felt they could manipulate their parents. "Absence of consistent leadership among these parent is remarkable (Rimm, 1988)." Nichols (1964) noted that children of "authoritarian" mothers obtained better grades in school and more favorable teacher ratings. This style of parenting was also associated with greater conformity and lack of originality. In the same vein, less conventional parenting (Getzels and Jackson, 1962) and parental expressiveness without dominance (Weisburg and Springer, 1961) were associated with creativity in children. As Olzewski, et. al. (1987) state, "...Family climate variables...are very interesting because they differentiate among families that produce creative individuals and high achieving, scholastically, competent individuals."

There seem to be a set of characteristics that

differentiate the families of gifted children from the average family. In a sample of gifted children, DeVaul (1988) reports that 87% of gifted students live in a traditional nuclear family. These families are highly educated with 75% of the parents having college degrees, and 50% have a post graduate degree by either the mother or father (Rimm, 1988). Rimm (1988), in her study of gifted children, reports, that of her sample , that the mothers were mainly homemakers. Matthews (1986) indicates that "families with gifted children indicate a higher level of adjustment in terms of problem solving, communication, roles affective responses, behavior control, and general functioning" as measured by standardized assessment devices.

Differences in Educational Systems

While some researchers choose to focus on the role of the family for determining academic success, other investigators have focused on the differences in the educational systems. As Akiko (1986) suggests, both models of education are reflective of the culture of the respective country. While the American system devotes more time to individuality and pluralism which

gives rise to creativity and innovation, the Japanese system is "homogenous in its goals, its school organization, curriculum structure, and examination policies (Imamura, 1986)." Whereas some commentators have suggested that the Japanese admire the innovation and the creativity of the American system, other observers have countered that the Japanese are merely being polite and are not interested in the American experience (Gordon, 1987).

Observers have noted that there are systemic differences between the two organizations. Such outstanding differences are "a broad and detailed national curriculum, tightly regulated course hours, abundant time devoted to school,...well disciplined behavior of students, and the use of groups in the classrooms (Inagaki, 1986)." Such basic differences between the two systems include the school year. Japanese students spend an average of 240 days in school while American students only spend approximately 180 days in school. Stevenson (1983) reports that American fifth grade teachers report devoting 15% of the school day on math instruction as opposed to the 24% spent by Japanese fifth grade teachers. Stevenson,

Stigler, and Shin-yung (1986) report Japanese children attended more closely to their teachers and engaged in less inappropriate behavior than their American counterparts. Imamura (1986) notes that although questioning by students is allowed in America, it is frowned upon in Japan. Besides the differences in student behavior, differences in teacher behavior also exist. American teachers tend to use the "prescriptive-directive approach" and end the presentation with divergent learning, while Japanese teachers will often begin with divergent thought production (Inagaki, 1986). Inagaki (1986) further observes that Japanese teachers use group interaction while their American counterparts rely on individual reinforcement, encouragement and feedback. The American style is more sequential and flexible and designed to probe.

Differences between the two systems can be found regarding homework. Stevenson (1983) reports that American parents and teachers do not consider homework to be of great value. This view contrasts greatly with the Japanese. "Once the child enters school, the family (read mother) will be responsible for homework

help because the homework is beyond the capability of the child (Imamura, 1986)." Japanese teachers even assign homework during July and August which is the longest vacation time.

Other differences are noted in Stevenson et. al. (1987). Basic differences, such as class arrangement and size, have been observed in the two cultures. This exhaustive study documented differences in amount of time engaged in academics (19.6% in the U.S. and 32.6% in Japan), time spent for teachers imparting information (21% for American teachers and 33% for Japanese teachers), and attending behaviors for students (46% for American children and 65% for Japanese children).

As suggested earlier, the Japanese system puts more focus on group interaction. Collins (1983) states that"...the vast majority of scholars of both Japanese and non-Japanese origin tend to support the view that the Japanese <u>are</u> more group oriented." The Japanese system gives little attention to individual variations, often ignoring the gifted or learning disabled. Collins (1983) notes that the group orientation is used to strongly motivate the student so that he "will not

only gain personal status and success", but that he will not disappoint his family, peers, or teachers. Since the time of Hull and Dewey, the American ideology of child training emphasized autonomy and individualism. Given the heterogeneity present in the U.S., Harnisch and Ryan (1986) suggests that " the family and school do not necessarily function as a support system for students." In fact, there may be conflict in several areas between family and school.

The competitive nature of the Japanese educational system has been well documented in the popular press. A standard saying in Japan is "Pass with four, fail with five", referring to the number of hours of sleep for a Japanese student. With the amount of competition and the number of students involved, this type of pressure is potentially destructive to a society. However, Collins (1983) reports that competition to get into school is framed as competition between student and exam, not student to student. There are negative side effects of this type of competition. Inagaki (1986) reports a high level of stress between student and parents, student mistrust of teachers, and the increasing incidences of secondary school violence.

Self -Concept

Although there are some inherent difficulties in studying the construct of self-concept across culture, this has proven to be another are of investigation for researchers. Lerner et.al. (1980) reports that Japanese adolescents indicate lower ratings of self esteem and less favorable views of body attractiveness. Ratings for Japanese males are higher than for Japanese females. However, there are some paradigmatic difficulties with Lerner et. al. They used the ratings of Japanese adolescents and compared them with reported results of American adolescents, thus by-passing direct comparisons. Kashawagi (1986) reports that elementary school children in six countries were asked to rate statements about their self esteem. Japanese children scored lowest while American children scored highest. As Kashawagi indicates, negative evaluation is pointed to as one of the general characteristics of self concept for Japanese. Kashawagi continues that American children are more likely to see their parents planning for their future, being counted by friends, doing well in school, and being proud of relatives.

Kashawagi (1984) indicates that differences exist in the treatment of sexes through the socialization process. These differences are more likely to be present in Japan than in America. "Japanese boys are subjected more intensively to the treatment provided by their mothers to facilitate the cognitive skills than girls (Kashawagi, 1984)." Boys tend to be provided with more opportunities and training that are of advantage to their later cognitive development.

The issue of self-esteem is important in understanding the Asian-American. Often, the Asian-American student is referred to as the model minority. Yet, studies show that they tend to experience a higher tendency towards apprehension, tension and introversion than their classmates (Minatoya, 1979). Minatoya also suggests that "despite these pressures, studies show that Asian-Americans utilize mental health services at a low rate." This suggests that the Asian cultural values such as "self-control, inconspicuousness" would be an admission to problems which might reflect poorly on the individual, family, and group (Minatoya, 1979). As Pang et. al. (1985) reports in a study of Sensei and Yonsei (third and fourth generation Japanese-American

students), these children do not feel as positive about their physical characteristics as do their white peers, despite their enculturation. Similar findings are reported by Fox and Jordan (1973) and Oanh and Michael (1977). Willis (1986) has raised the issue of the student attending international schools. Often these students attend school in one country; however, they hold citizenship in another country. As Willis reports, often these students are "third culture kids", not belonging to any one culture. Western cultures value autonomy, independence, and assertiveness while Asians traditionally value belonging to a group and self-sacrifice. Mordkowitz (1986) reports that Asian-American students that were raised as "white" were "given more freedom, but possible cared less about their culture and that they would have a less positive image of academic achievement and less willingness to work hard, but developed social skills."

The role of self concept in gifted children has been an area of research that has often yielded contrasting findings. Tidwell (1980) and Yates (1975) observed in their populations that gifted children have measured self concepts higher than their less able age

mates. Other data indicates lower self concepts were reported by gifted in similar contrasts (Fults, 1980; Rogers, 1979; Stopper,1978). Such opposing findings are common in the literature on self concept in the gifted. Coleman and Fults (1982) suggest that the role of social comparison is vital in discussing these results. They report that mildly mentally retarded students show a higher self concept in homogenous special education classroom due to less variability of ability in the classroom. This promotes a favorable social comparison. However, as the gifted are segregated into homogenous placements, the social comparison becomes less favorable. As Coleman and Fults suggest, students in pull out programs report higher self concepts than their counterparts in self contained programs. High achieving students scored higher on measured self concept than their counterparts in pull out programs (Coleman and Fults, 1982). But, as Coleman and Fults (1985) report, gifted children continue to have robust self concepts despite their placement.

The role of attribution has also been explored in examining differences between Japanese and American

students. In the U.S., attribution theory predicts that motivated behavior should be associated with attributions to "stable internal factors, such as ability," to explain performance. Unsuccessful performance is attributed to "unstable conditions, like lack of effort" (Halloway, 1987). Cultural differences are noted in the concept of attribution. Japanese students attribute failure to lack of luck. "Ability is not the sole or even most important determinant in measuring success according to Japanese standards" (Harnisch and Ryan, 1983). Ryckman (1988) points out that parents also use this attributional pattern. Japanese mothers in the study attribute their children's failure to a lack of effort while American mothers attribute their children's failure to a lack of ability. As Gordon (1987) points out, Japanese (and Chinese) believe much more than Americans in personal malleability. This raises an interesting question for the student educated outside of Japan. As Azuma (1986) suggests, "if a child's first schooling was in the U.S. or England, he or she would have acquired, for example, a script for success in school, emphasizing independence, explicitness, and uniqueness-quite un-

Japanese values."

Learning Styles

One promising line of research into the difference between the Japanese and American educational performance is the literature on learning style differences. One such line of research has attempted to explain the differences in performance in relation to differences in cerebral hemispheric functioning. Tsunoda (1975, 1976, 1978) has reported characteristic physiological differences in the ways native Japanese and individuals from Western cultures process auditory stimulus. Tsunoda continues that these differences deteriorate when second and third generations of Japanese are born and reared in environments where Western languages are spoken. These individuals tend to develop the same cognitive patterns as their Western counter parts. To follow up on this line of research, Torrance and Sato (1979) assessed the thinking styles of Japanese and American college students. Using the "Your Style of Learning and Thinking", Torrance and Sato found that Japanese students scored highest on measures of lateral hemispheric functioning; however, American students scored highest on tasks requiring

integrated functioning. But, as Jausovac (1985) suggests, exploring thinking differences may not be as simple as the Left-Right hemispheric dichotomy might suggest.

Many researchers, in an attempt to examine cognitive style, have looked to the atypical learner, often focusing on the gifted learner. Stewart (1981) and Ristow and Edelburn (1985) noted the factor of independence in the performance of the gifted student. These students show a preference for independent study and discussion. Griggs and Price (1982) reported in their study of gifted junior high students that they were more "persistent, tolerated the presence of sound, preferred learning alone to a greater extent." These student were also less dependent on teacher motivation and demonstrated less auditory preferences (Griggs and Price, 1982). Barbe (1981, 1982) suggests that gifted students often utilize visual channels for learning than shift to integrating modalities.

Another line of research is the use of Jung's personalty typology. "Jung saw himself as working to bridge cultural differences with his psychology...(which) reflect the non-occidental

sensitivities of the theory. (Shaker, 1982)." Shaker (1982) reports that Jung's typology seems to provide a method to promote better understanding of the learner.

Myers and Briggs (1985) based the Myers-Briggs Type Indicator on Jung's theory of typology. "The essence of the theory is that much seeming variation in behavior is actually quite orderly and consistent, being due to basic differences in the way individuals prefer to use their perception and judgement. (Manual, 1985)." Proponents of the MBTI such as Elliot and Sapp (1988) have suggested that knowledge of Jungian psychological types provides a method of identification of learning styles and how they relate to students in the elementary and secondary school levels. Myers and Briggs (1985) felt that environments foster development of each person's natural preferences or it can discourage their natural bent by reinforcing activities that are less satisfying.

Some researchers have related various constructs from the Myers-Briggs to academic achievement. "When predicting performance, aptitude is the most measurable. When aptitude appears insufficient to account for high academic achievement, then the

presence of some other favorable characteristic may be inferred. (Manual, 1985)" Research using type theory has focused on using the introversion/extroversion dimension as accounting for academic performance. It is felt that introverted and intuitive types will have an advantage, since their interest matches academic tasks (Manual, 1985). However, there seems to be a developmental shift with academic performance being correlated with extroversion in the primary and intermediate grades. Introverted types seem to be late bloomers and gradually develop an advantage around eighth grade (Fourqueran, 1988). Fuchner and Barling (1978) pointed out that "internals" also scored higher of achievement tests and had higher grade point averages. Delbridge-Parker and Robinson (1989) report that in a general high school population that 51% of the students show a preference for extroversion while only 10% of a gifted population demonstrate that same preference. It is also noted that 41% of the National Merit Scholars demonstrate a preference for introversion (Delbridge-Parker and Robinson, 1989). Kashawagi (1986) states " the relationship of internality to high academic achievement, consistently

positive in the U.S., is not appreciable in Japanese students." As Ryckman (1988) reports, Japanese students scored higher on the external end than American students.

Fourequran et al (1988) have investigated other dimensions in the acquisition of academic success. In a study of gifted children, the researchers noted that the Sensing-Intuitive dimension was a much stronger correlate of academic success than the Introversion/extroversion dichotomy. Delbridge-Parker and Robinson (1989) reported that in their population of gifted high school students that the preference for Intuitive types was 75% , a greater representation than found in a general high school population.

Recapitulation

The literature on family environment emphasizes the differences in child rearing practices between the Japanese and American cultures. Such factors, as autonomy and self-reliance, which are valued and encouraged in American culture, are frequently discouraged in Japanese culture. Family involvement in school is another reported source of difference. American parent's involvement is school is much less

than that of Japanese parents. In fact, the phenomenon of "kyoiku mama" stresses the involvement of especially the Japanese mother.

As discussed earlier, Asian-American families appear to be a separate entity, being a product of the two cultures. Although viewed as the "model minority", there appears to be separate and distinct issues related to being a member of an Asian-American family. In taking a "relativist fuctionalism" approach to examining the superior academic performance of Asian-American students, educational opportunities are one of the only channels for Asian-american individuals to be upwardly mobile. in an American society.

As with family environment, the research on difference in educational systems stresses the differences between Japanese and American systems. While the Japanese tend to begin their lessons with divergent thought production, American teachers will use the "prescriptive-directive approach". The American approach relies on individual reinforcement, encouragement, and feedback. The Japanese approach again is much more group oriented.

Although the construct of self-concept is

difficult to assess across cultures, several attempts have been made to do this. The research indicates that Japanese students tend to rate themselves lower than their American counterparts. Negative evaluation, however, is a general characteristic of self concept in Japan. Attribution theory is another area of investigation between the two cultures. Japanese students attribute failure to lack of effort as opposed to Americans who perceive failure as a lack of ability.

Studies show that Asian-Americans tend to experience a higher tendency towards apprehension, tension and introversion than their classmates. Asian-American students may have difficulty in mediating conflicting Western and Asian values in the context of American society.

Some researchers have turned to learning style differences to examine differences in the performances of students. However, little cross-cultural research has been done in this area. Learning style differences have been noted in this culture which presumably related to academic excellence. Some researchers believe that Jungian personality typology can cross and possibly bridge cultures.

The areas of investigation discussed in this chapter (family environment, self concept, study habits, and cognitive style) have, in isolation, yielded interesting and important results. However, these studies have not been designed to test the possible inter-relationships among these constructs. The possibility exists that the superiority of Japanese students' academic performance is due to a combination of these constructs as opposed to the contribution of one factor. The study reported here was designed in an attempt to investigate the contribution of each of these constructs, in combination or isolation, to the prediction of excellence in academic performance across these cultural groups (American. Japanese-American, and Japanese).

CHAPTER III

METHOD

Hypotheses

The following null hypotheses were tested:

HO1: There will be no significant differences in styles of learning across cultures.

HO2: There will be no significant differences in reported study habits across cultures.

HO3: There will be no significant differences among student, parent, and teacher ratings of self-concept.

HO4: There will be no significant relationship between the family environment scores and self-concept scores.

HO5: There will be no significant differences in family environment across cultural groups.

Subjects

Fifty male students between the ages of 7 and 12 and representative of three groups (Japanese, Japanese-American, and American) were solicited for participation in this study. Students were requested to complete four research instruments (The Murphy-Meisgeier Type Indicator for Children, The Piers-Harris Self-Concept Scale for Children, The Family Environment Scale, and a Study Habits Survey). In addition,

parents completed a rating of their child's self-concept and the student's teacher completed a measure of the student's self-concept.

The "American" sample (n=41) was solicited from two suburban Chicago school districts. The "Japanese-American" sample (n=31) was selected from a group of students who attended a Japanese cultural school on Saturdays but attended a regular American suburban school during the week. The "Japanese" sample (n=31) was chosen from a Japanese school located in a suburban area in Japan. All subjects scored at or above the ninety-third percentile of a standardized measure of mathematics achievement. These mathematics achievement scores were available for both the "American" and " Japanese" groups. However, This information was not available for the "Japanese-American" group. For the "Japanese-American" the Math Computation subtest from the Kaufman Test of Educational Achievement was administered in order to estimate mathematic achievement.

To eliminate possible sex bias, only males, between seven and twelve years of age were included in the final sample.

Instrumentation

Subjects completed the following instruments:

Murphy-Meisgeier Type Indicator for Children (MMTIC)

The MMTIC is an instrument which identifies individual learning style. It is based on C.G. Jung's ideas about perception and judgement. The MMTIC consists of 70 items measuring four dichotomies: extroversion/introversion, sensory perception/intuitive perception, thinking judgement/feeling judgement, judgement/perception. The results of the MMTIC identify how a child best perceives and processes information.

Split half reliabilities are reported in the .60 to .70 range. Test-retest discriminant function scores fall between .58 to .69. Content validity, judged by twenty-one individuals familiar with the concepts of psychological type, was felt to strong for this instrument.

Piers-Harris Children's Self-Concept Scale

The scale consists of 80 declarative statement to which the child must respond "Yes" or "No". Items are organized into six subscales or clusters that were created through the use of factor analysis; behavior,

intellectual and school status, physical, anxiety, popularity, and happiness-satisfaction.

In a general population, test-retest reliabilities fell in the .71 to .75 range with an interval of 5 months. Internal consistencies calculated on a normative sample of 297 sixth and tenth graders yielded reliability estimates in the .88 to .93 range for the various groups. Convergent validity studies with the Tennessee Self-Concept Scale report correlation coefficients of .77.

Family Environment Scale

The FES comprises ten subscales that measure the social-environmental characteristics of all types of families. The FES subscales are as follows: cohesion, expressiveness, conflict, independence, achievement orientation, intellectual-cultural orientation, active-recreational orientation, moral-religious emphasis, organization and control.

Test-retest reliability studies indicate reliabilities in the .68 to .86 range. The internal consistencies are all in an acceptable range, varying from moderate for Independence and Achievement Orientation to substantial for Cohesion, Organization,

Intellectual-Cultural Orientation, and Moral-Religious Emphasis. Moos and Moos (1986) report good construct validity.

Study Habits Survey

The survey is a 30 item checklist designed to identify the study habits of students (see Appendix C for details). The student is asked to rate a series of items on a four point lickert scale. Questions range from actual study environment to the presence of distracting stimulus that might detract from studying.

Other Measures

One parent of the participating student completed an adapted version of the Piers-Harris Self-Concept Test. In addition, the student's teacher completed a measure of student self-esteem.

Design

Independent Variables

Cultural Groups

1. Japanese
2. Japanese-American
3. American

Raters

1. Student
2. Parent
3. Teacher

Dependent Variables

Scores on the following scales:

Murphy-Meisgeier Type Indicator for Children

1. Extraversion/Introversion (EI)
2. Sensing/Intuition (SN)
3. Thinking/Feeling (TF)
4. Judging/Perceiving (JP)

Piers-Harris Children's Self-Concept Scale

1. Behavior
2. Intellectual/School Status
3. Physical Appearance and Attributes
4. Anxiety
5. Popularity
6. Happiness and Satisfaction

Family Environment Scale

1. Cohesion
2. Expressiveness
3. Conflict
4. Independence
5. Achievement Orientation

6. Intellectual-Cultural Orientation
7. Active-Recreational Orientation
8. Moral-Religious Emphasis
9. Organization
10. Control

Study Habits Survey

Statistical Analysis

The results were analyzed by using a combination of multivariate analysis of variance, multiple regression, and correlational procedures.

CHAPTER IV

RESULTS

As stated earlier, the overall purpose of this research project was to examine the cognitive and affective variables related to the performance of mathematically talented children across three cultures. That is to say, the design of the study permits the exploration of possible cultural differences in the attainment of academic success.

The dependent variables used in this study were the scores obtained on four scales (Murphy-Meisgeier Type Indicator for Children, Piers-Harris Self-Concept Scale for Children, Family Environment Scale, and Study Habits Survey). The means, standard deviations, and sample sizes are presented in Table 1, 2, and 3.

The independent variables in this study were cultural groups ("American", "Japanese-American", and "Japanese") and rates (student, parent, teacher).

Table 1

Means, Standard Deviations, and Sample Sizes of the MMTIC Scores Across Cultural Groups

	MMTIC Scales			
Groups	EI	SN	TF	JP
American (n=44)				
Mean	48.886	66.409	68.273	72.114
SD	7.794	8.406	8.525	8.893
Japanese-American (n=49)				
Mean	47.020	67.449	65.082	70.490
SD	8.450	5.572	6.611	7.428
Japanese (n=34)				
Mean	47.212	68.606	66.030	68.364
SD	7.482	6.869	5.480	6.878

Table 2
Means, Standard Deviations, and Sample Sizes of the Family Environment Scale Across Cultural Groups

Subscales	Groups		
	A	JA	J
Cohesion	7.455	6.389	5.278
	1.886	1.573	1.799
Expressiveness	4.682	6.028	5.212
	1.877	1.812	1.867
Conflict	3.455	4.083	4.576
	1.982	1.857	2.500
Independence	6.295	6.222	5.818
	1.374	1.124	.0983
Achievement-Orientation	5.682	5.278	5.545
	1.581	1.573	1.954
Intellectual-Cultural Orientation	6.523	6.566	5.636
	2.129	1.764	1.966
Active-Recreational Orientation	6.659	6.500	5.333
	1.804	1.859	1.947
Moral-Religious Emphasis	5.364	4.046	4.000
	2.334	1.330	1.436
Organization	5.750	5.750	4.909
	2.136	2.335	1.893
Control	5.000	3.972	4.333
	1.657	1.540	1.762

Mean=top
SD=standard Deviation

Table 3
Means and Standard Deviations of student, parent and teacher ratings on the Piers-Harris Children's Self-Concept Scale Across Cultural Groups

Scale	Student Ratings		
	A	JA	J
Behavior	13.194	11.611	11.000
	2.822	3.588	2.940
Intellectual/ School Status	14.355	11.639	10.625
	2.402	3.482	3.490
Physical Appearance/ Attributes	10.387	8.056	7.656
	2.679	3.414	3.790
Anxiety	10.710	9.194	8.813
	1.918	2.054	2.292
Popularity	8.194	8.694	7.719
	1.939	1.802	2.750
Happiness/ Satisfaction	8.935	8.139	7.563
	1.365	1.854	2.047

	Parent Ratings		
	A	JA	J
Behavior	14.065	12.806	11.781
	1.289	1.704	2.612
Intellectual/ School Status	14.742	12.306	11.750
	1.237	2.827	3.927

Table 3-Continued

Physical Appearance/ Attributes	11.935 1.289	9.167 2.657	8.844 2.807
Anxiety	10.645 1.704	9.472 1.859	8.500 2.540
Popularity	9.323 1.759	9.583 1.296	9.063 1.544
Happiness/ Satisfaction	9.129 1.204	8.694 1.305	8.000 1.778

	Teacher Ratings		
	A	JA	J
Behavior	12.903 3.458	13.083 2.623	13.000 1.884
Intellectual/ School Status	13.903 2.256	14.444 1.629	12.781 2.310
Physical Appearance/ Attributes	10.161 2.945	9.889 2.594	8.906 3.125
Anxiety	10.000 2.620	10.583 1.663	9.656 1.753
Popularity	8.742 2.852	9.472 1.699	9.219 1.755
Happiness/ Satisfaction	8.161 2.782	8.694 1.261	7.344 1.825

top=mean
bottom=standard deviation

To test the first null hypothesis, a one-way multivariate analysis of variance (MANOVA) was performed across groups using the MMTIC scores as the dependant measure. To test the second null hypothesis, a MANOVA procedure was utilized to test for differences is Study Habits Survey scores across groups. To test the third hypothesis, a 3 (culture) X 3 (rater) repeated measures MANOVA was performed on the self-concept scores. For the fourth null hypothesis, a regression procedure was used to examine the inter-relationships between the family environment and self-concept scores. Finally, to test the fifth null hypothesis,a one way repeated measures MANOVA was performed FES scores across groups.

Results Relating to Testing Null Hypothesis One

The first null hypothesis states that there will be no significant difference in style of learning scores across cultures. One way MANOVA analysis showed that there were no significant differences in learning styles across culture. Thus, null hypothesis number one was not rejected.

Results Relating to Testing Null Hypothesis Two

The second null hypothesis states that there will be no significant differences in reported study habits scores across cultures. The second null hypothesis was rejected. The statistical analysis of the results indicated that there were significant differences on six of the thirty questions on the Study Habits Survey. These results are presented in Table 4. The Japanese and American populations differed significantly on their responses to question two, with the American group reporting a higher mean score. On question four, the American groups differed from the Japanese and the Japanese-American group differed from the Japanese group of students. The Americans reported the highest mean response (mean=2.955) while the Japanese-American students reported the next highest (mean=2.776). Again the American group reported the highest mean for question ten, which proved to be significantly different from both the Japanese-American group (mean=1.449) and the Japanese group(mean=2.000). On question thirteen, the Japanese-American and Japanese students differed, with the Japanese students reporting a higher mean score on the question (mean=1.833) com-

Table 4

Significant Differences between Cultural Groups on the Study Habits Survey

Question Number	Group Comparisons A/JA	A/J	JA/J
TWO (F(2,120)=6.217) p=<.003	.075	.001*	.061
FOUR (F(2,120)=6.426) p=<.002	.101	.0001*	.039*
TEN (F(2,120)=6.989) p=<.001	.0001*	.039*	.159
THIRTEEN (F(2,120)=3.229) p=<.043	.332	.118	.013*
FOURTEEN (F(2,120)=8.041) p=<.001	.0001*	.002*	.715
TWENTY-FOUR (F(2.120)=3.308) p=<.040	.013*	.091	.513

A=American
JA=Japanese-American
J=Japanese

*p<.05
**p<.001
***p<.0001

pared to 1.340 for the Japanese-American students). The American group differed from both the Japanese-American and Japanese groups on question fourteen. The American mean response was significantly higher than both the Japanese-American and Japanese mean responses. Finally, the significant difference for question twenty-four was between the American and Japanese-American groups. The Japanese-American group mean response was found to be significantly higher than the

American students' group mean response.

Results Relating to Testing Null Hypothesis Three

The third null hypothesis states that there will be no significant difference between student, parent, and teacher ratings of self-concept across cultural groups. The third null hypothesis was rejected. The analysis of the results indicated that there were significant and complex multivariate interactions between culture and raters. On scale one (Behavior) the American students (mean=13.194,sd=2.822) scored higher than both Japanese-Americans (mean=11.611,sd=3.588) and the Japanese students (mean=11.000,sd=2.940). This trend was also noted for the parent group, with the American parents rating (mean=14.065,sd=1.289) their children's self-concept higher than both the Japanese American (mean=12.806,sd=1.704) and Japanese parents (mean=11.781,sd=2.612). All three teacher group means for Behavior were within a range of .080.

On scale two (Intellectual/School Status) American students' self-concept scores were higher than the other two groups. Additionally, the Japanese-American students scores fell between both the American and

Japanese students. This same pattern was found with the parent ratings. The American parents rated their children's self-concept highest and the Japanese parents reported the lowest scores. The Japanese-American teachers reported the highest ratings on this scale, with the American teachers ratings falling between the Japanese-American and Japanese teachers.

The pattern changed slightly on scale three (Physical Appearance/Attributes). Again, American students reported the highest ratings of self-concept, followed by the Japanese-American ratings and then the Japanese students ratings. American parents also reported the highest ratings of self-concept, followed by the Japanese-American and Japanese parents ratings. This trend was also found with the American teachers. They reported the highest ratings, followed by the Japanese-American ratings and then finally by the Japanese teacher ratings.

On scale four (Anxiety), the same pattern was noted again. American students and parents reported higher ratings on this scale than did Japanese-American and Japanese students. However, Japanese-American teachers reported higher ratings than the American and

Japanese teachers.

However, on Scale five (Popularity), a different pattern emerged. Japanese-American ratings were found to be higher for all three rater groups compared with the than American and Japanese ratings. American students and parents rated this scale higher than Japanese students and parents. However, this is the only scale where Japanese teacher rated students higher than their American counterparts.

On Scale six (Happiness/Satisfaction) a similar pattern emerged. American students and parents reported the highest ratings followed by the Japanese-American and then the Japanese groups. On this scale, Japanese-American teachers reported the highest scores, followed by the American and then the Japanese teachers.

Finally, on all of the scales except for scale four (Anxiety), the parent ratings of student self-concept were found to be higher than the student ratings. Although the groups differed according to culture, the magnitude of the difference between student and parent ratings appears consistent. On scale four, the student and parent ratings are more in

line with each other. More variability is noted on the teacher ratings. While the American teachers tended to rate the student self-concept lower on four of the six scales(Behavior, Intellectual/School Status, Anxiety,and Happiness/Satisfaction), the Japanese teachers rated their students self-concept higher on five of the six scales(Behavior, Intellectual/School Status,Physical Appearance/Attributes,Anxiety,and Popularity). The Japanese-American teachers rated their students self-concept higher on all six scales.

Significant differences between cultural groups were noted. These results are presented in Table 5. Significant differences were found between the American and Japanese-American populations on four of the six scales. Differences on five of the six scales were found between the American and Japanese populations. Finally, differences on three of the six scales were noted for the Japanese-American and Japanese groups.

Although of less significance because of the cultural factors, significant differences in self-concept were found between raters. These differences are qualified by the multivariate interactions discussed earlier.

Table 5

Level of significance(p-values) between Cultural groups on the Piers-Harris Children's Self-Concept Scale

	Groups		
Scale	A/JA	A/J	JA/J
Behavior (F(2,287)=7.213) p=<.001	.020*	.0001***	.121
Intelligence/School Status (F(2,287)=20.398) p=<.0001	.0001***	.0001***	.010*
Physical Appearance/Attributes (F(2,287)= 17.141) p=<.0001	.0001***	.0001***	.170
Anxiety (F(2,287)=11.875 p=<.0001	.014*	.0001**	.012*
Happiness/Satisfaction (F(2,287)=9.557 p=<.0001	.212	.0001***	.002*

*p<.05
**p≤.01
***p≤.001

A summary of the results are presented in Table 6. Differences on three of the six scales, related to Behavior, Physical Appearance/Attributes, and Popularity, were noted for the student-parent comparisons. Four of the six scales proved to be significant for the student-teacher comparisons. Finally, only the scores on one scale were found to be

significantly different between the teacher and parent ratings.

Table 6

Levels of Significance(p-values) between Raters on the Piers-Harris Children's Self Concept Scale

Scale	Rater S/P	S/T	P/T
Behavior(F(2,287)=4.761 p=<.009	.012*	.005**	.784
Intellectual/School Status (F(2,287)=8.749 p=<.0001	.054	.0001**	.026*
Physical Appearance/Attributes (F(2,287)= 5.148 p=<.006	.002**	.022*	.437
Popularity (F(2,287)=8.955 p=<.0001	.0001***	.001**	.560

S=Student
P=Parent
T=Teacher

*p≤.05
**p<.01
***p<.001

Results Relating to Testing Null Hypothesis Four

The fourth null hypothesis states that there will be no significant relationship between the family environment scores and self-concept scores. Because significant relationships between the Family Environment Scale scores and the Piers-Harris Self-

Concept Scale scores were found across cultural groups, this hypothesis was rejected.

In using a stepwise multiple regression procedure to test for the inter-relationships of the dependent measures for the American sample, three scales of the Piers-Harris had all variables except for one eliminated from the regression equation. For Scale Two (Intellectual/School Status), a significant relationship with the Conflict Scale of the FES was found. The Expressiveness Scale of the FES was found to be significantly related to both Scale Four (Anxiety) and Scale Five (Popularity) of the Piers-Harris Scale.

For Scale One (Behavior), of the Piers-Harris, the stepwise regression procedure yielded the following significant subset of predictor variables: Conflict and Moral-Religious Emphasis. A commonality analysis indicated that the Conflict Scale accounts for 15.7% of the variance whereas the Moral-Religious Emphasis Scale accounts for only 5.3% of the variance. Together, these variables account for 3% common variance.

For Scale Three (Physical Attractiveness/ Attributes), of the Piers-Harris, the stepwise

regression procedure yielded a significant subset of two predictor variables: Moral Religious Emphasis and Control. A commonality analysis indicated that the Moral Religious Emphasis Scale accounted for 8.2% of the unique variance and the Control Scale accounted for 6.4% of the variance. These variable accounted for 0 % of the common variance.

For Scale Six (Happiness/Satisfaction), of the Pier-Harris, the stepwise procedure yielded the following significant subset of predictor variables: Conflict, Moral Religious Emphasis, and Control. The commonality analysis showed that 11.4% of the unique variance was accounted for by the Conflict Scale, 13.9% of the unique variance was accounted for by the Moral-Religious Emphasis Scale, and 4.4% of the unique variance was accounted for the Control Scale. 5% of the common variance was accounted for by the first two variables while 4.4% of the common variance was accounted for by the Conflict and Control Scales. Moral-Religious Emphasis and Control accounted for 0% of the common variance. All together, these three variables accounted for 0% of the variance.

The stepwise regression procedure was also

utilized to test the inter-relationships among the Japanese-American student groups. For three of the Piers-Harris Scales (Physical Attractiveness/ Attributes, Popularity, and Happiness/Satisfaction), only Scale Three (Conflict) of the FES was found to have significant relationship.

Table 7

Commonality Analysis for Factors Predicting the Pier-Harris Scores for American students

Behavior

Sources of Variance	Conflict	MRE
Uniqueness (CON)	.157	
Uniqueness (MRE)		.053
Common (CON-MRE)	.03	.03

Physical Attractiveness/Attributes

Source of Variance	MRE	CTL
Uniqueness (MRE)	.082	
Uniqueness (CTL)		.064
Common (MRE-CTL)	0.00	0.00

Happiness/Satisfaction

Source of Variance	CON	MRE	CON
Uniqueness(CON)	.114		
Unique (MRE)		.139	
Unique (CTL)			.044
Common (CON-MRE)	.05	.05	
Common (CON-CTL)	.044		.044
Common (MRE-CTL)		.000	.000
Common(CON-MRE-CTL)	.000	.000	.000

Table 8

Inter-correlation matrices between FES and Piers-Harris Scores for American students

	CON	MRE	Behavior
CON	1.0		
MRE	.141	1.0	
Behavior	-.433	.288	1.0

	CON	ISS
CON	1.0	
ISS	-.288	1.0

	MRE	CTL	PAA
MRE	1.0		
CTL	.084	1.0	
PAA	.288	.023	1.0

	EXP	ANX
EXP	1.0	
ANX.	.410	1.0

	EXP	POP
EXP	1.0	
POP	.249	1.0

Table 8-continued

	CON	MRE	CTL	HS
CON	1.0			
MRE	-.141	1.0		
CTL	.217	.084	1.0	
HS	-.451	.411	-.261	1.0

Additionally, for Scale Four (Anxiety) of the Piers-Harris, there were no significant relationships noted in the regression procedure.

For Scale One (Behavior), of the Pier-Harris, the stepwise procedure yielded the following significant subset of FES predictor variables: Conflict, Intellectual/Cultural Orientation, Achievement, Expressiveness, and Control. A commonality analysis suggests that the unique variance was accounted for in the following manner:Conflict accounts for 27.7% of the unique variance,Intellectual/ Cultural Orientation accounts for 5.7% of the variance, Achievement accounts for 10.1% of the variance, and Expression accounts for 6.7% of the variance. When analyzing the commonality, Conflict and Achievement accounted for 8.9% of the

variance while Intellectual/Cultural orientation accounted for 3.8%. All four variables accounted for 1% of the shared common variance.

For Scale Two, Intellectual/School Status, of the Piers-Harris, two variables were found to have significant relationship: Conflict and Intellectual Cultural Orientation. The Conflict scale accounted for 14.0% of the unique variance while the Intellectual/Cultural Orientation Scale accounted for 7.1% of the unique variance. Together, the two scales accounted for 0% of the common variance.

Table 9

Commonality Analysis for Factors Predicting Factors for the Piers-Harris Scores for Japanese-American Students

Behavior

Source of Variance	CON	ICO	ACH	EXP
Unique(CON)	.277			
Unique(ICO)		.057		
Unique(ACH)			.101	
Unique(EXP)				.067
Common(CON-ICO)	.000	.000		
Common(CON-ACH)	.000		.000	
Common(CON-EXP)	.000			.000
Common(ICO-ACH)		.000	.000	
Common(ICO-EXP)		.038		.038
Common(ACH-EXP)			.000	.000
Common(CON-ICO-ACH)	.004	.004	.004	
Common(CON-ICO-EXP)	.000	.000		.000
Common(ICO-ACH-EXP)		.000	.000	.000
Common	.01	.01	.01	.01

Table 9-continued
Intellectual School Status

Source of Variance	CON	ICO
Unique (CON)	.140	
Unique (ARO)		.071
Common (CON-ARO)	.000	.000

Table 10

Inter-correlation Matrices between the FES and Piers-Harris scores for Japanese-American students

	EXP	CON	ACH	ICO	CTL	BEH
EXP	1.0					
CON	.002	1.0				
ACH	-.310	.392	1.0			
ICO	.259	.034	-.103	1.0		
CTL	-.129	.115	.312	.224	1.0	
BEH	.239	-.428	.026	.274	-.153	1.0

	CON	ICO	ISS
CON	1.0		
ICO	.034	1.0	
ISS	-.379	.262	1.0

	CON	PAA
CON	1.0	
PAA	-.486	1.0

	CON	POP
CON	1.0	
POP	-.488	1.0

Table 10-continued

	CON	HS
CON	1.0	
HS	-.365	1.0

In using the stepwise regression procedure with the results of the Japanese students' responses, Scale Four (Anxiety), of the Piers-Harris, yielded one significant predictor variable (The Conflict Scale of the FES). The following subset of variables were found to be significant predictors:

Behavior: Organization, Moral-Religious Emphasis, Cohesion

Intellectual/School Status: Organization, Cohesion, Active-Recreational Orientation, Achievement, Intellectual/Cultural Orientation

Physical Attractiveness/Attributes:Cohesion, Active-Recreational Orientation, Expressiveness

Popularity: Cohesion,Active/Recreational Orientation

Happiness/Satisfaction:Cohesion,Organization

A commonality analysis for the Behavior Scale of the Piers-Harris indicated that the Organization Scale accounted for 30.4% of the unique variance while the Cohesion accounted for 9.3% and the MRE accounted for 5.1% of the unique variance. The Organization and Cohesion scales accounted for 11.9% of the variance together. The Organization and MRE scales accounted for 0% of the variance. The Cohesion and MRE scales accounted for 0% of the variance. All three variables, however, only accounted for 1.1%.

A commonality analysis on the Intellectual/School Status Scale indicated the Organization accounted for 17.2% of the unique variance, Cohesion accounted for 6.9% of the unique variance, Active/Recreational Orientation accounted for 5.9% of the unique variance, and Achievement accounted for 4% of the unique variance. Together, Organization and Cohesion accounted for 9% of the variance, Organization and Active/Recreational Orientation accounted for 1.6% of the variation, Organization and Achievement accounted for 1.1% of the variance. The only other combination that accounted for common variance was the Organization, Cohesion, and Active/Recreational

Orientation combination which accounted for 6.4% of the variance. All together, these variables did not account for any common variance (0%).

The commonality analysis on the factors in the equation predicting the Physical Attractiveness/ Attributes Scale indicated that the Cohesion scale accounted for 18.3% of the unique variance while ARO accounted for 8.5% and Expressiveness accounted for 5.7% of the variance. When Cohesion and ARO are placed together, they accounted for 9.9% of the variance in common. The rest of comparisons accounted for 0 % of the variance. In combination, these three variables accounted for 1% of the common variance.

The commonality analysis on the factors predicting the Popularity Scale indicated that Cohesion accounted for 11.9% of the unique variance while ARO accounted for 6.2% of the unique variance. Together, they accounted for 10.5% of the variance.

The commonality analysis on the factors predicting the Happiness/Satisfaction Scale indicated that the Cohesion scale accounted for 10.3% of the variance while the Organization scale accounted for 6.9% of the variance. Together, they accounted for 8.2% of the

common variance.

Table 11

Commonality Analysis for Factors predicting Piers-Harris Scores for Japanese Students

Behavior

Source of Variance	ORG	COH	MRE
Unique (ORG)	.304		
Unique (COH)		.093	
Unique (MRE)			.051
Common (ORG-COH)	.119	.119	
Common (ORG-MRE)	.000		.000
Common (COH-MRE)		.000	.000
COmmon (ORG-COH-MRE)	.011	.011	.011

Intellectual/School Status

Source of Variance	ORG	COH	ARO	ACH
Unique(ORG)	.172			
Unique(COH)		.069		
Unique(ARO			.059	
Unique(ACH)				.04
Common(ORG-COH)	.09	.09		
Common(ORG-ARO)	.016		.016	
Common (ORG-ACH)	.011			.011
Common(COH-ARO)		.063	.063	
Common(COH-ACH)		.000		.000
Common(ARO-ACH)			.000	.000
Common(ORG-COH-ARO)	.000	.000	.000	.000
Common(ORG-COH-ACH)	.000	.000		.000
Common(COH-ARO-ACH)		.000	.000	.000
COMMON	.000	.000	.000	.000

Physical Attractiveness/Attributes

Source of Variance	COH	ARO	EXP
Unique (COH)	.183		
Unique (ARO)		.085	
Unique (EXP)			.057
Common (COH-ARO)	.099	.099	
Common (COH-EXP)	.000		.000
Common (ARO-EXP)		.00	.00
Common (COH-ARO-EXP)	.01	.01	.01

Table 11-continued

Popularity

Source of Variance	COH	ARO
Unique (COH)	.119	
Unique (ARO)		.062
Common (COh-ARO)	.105	.105

Happiness/Satisfaction

Source of Variance	COH	ORG
Unique (COH)	.103	
Unique (ORG)		.062
Common(COH-ORG)	.082	.082

Table 12

Inter-correlation matrices between the FES and Piers-Harris scores for Japanese students

	COH	MRE	ORG	BEH
COH	1.0			
MRE	.440	1.0		
ORG	.325	.233	1.0	
BEH	.430	.038	.641	1.0

	COH	ACH	ARO	ORG	ISS
COH	1.0				
ACH	-.134	1.0			
ARO	.377	-.178	1.0		
ORG	.328	.003	.069	1.0	
ISS	.514	.120	.420	.585	1.0

Table 12-continued

	COH	EXP	ARO	PAA
COH	1.0			
EXP	.422	1.0		
ARO	.377	.312	1.0	
PAA	.497	.048	.422	1.0

	COH	ARO	POP
COH	1.0		
ARO	.422	1.0	
POP	.474	.409	1.0

	COH	ORG	HS
COH	1.0		
ORG	.325	1.0	
HS	.475	.309	1.0

Results Relating to Testing Null Hypothesis Five

The fifth null hypothesis states that there will be no significant difference between the family environment scores across cultures.

The fifth null hypothesis was rejected. The analysis of the results indicated that there were significant differences in the family environment scores across groups on five of the ten scales on the Family Environment Scale. These results are presented in Table 7. As the table shows, the American sample

differed from the Japanese-American sample on four of the ten scales. Of these scales, the American sample demonstrated significantly higher means on the following scales: cohesion, moral-religious emphasis, control. The Japanese-American sample demonstrated a higher mean on expressiveness when compared with the American group. The American and Japanese samples significantly differed with respect to their scores on the cohesion, active-recreational orientation, and moral-religious scales. On these scales, the American sample scored significantly higher than the Japanese group. Finally, the Japanese-American and Japanese samples were found to differ on the active-recreational scale, while the Japanese-American sample scored significantly higher on this scale.

Table 13

Levels of significance (p-values) between Cultural Groups on the Family Environment Scale

Scale	Groups A/JA	A/J	JA/J
Cohesion (F(2,110)=10.281) p=<.0001	.007**	.0001***	.097
Expressiveness (F(2,110)= 5.238), p=<.007	.002**	.217	.071
Active-Recreational Orientation (F(2,110)=5.360) p=<.006	.705	.003**	.011*
Moral-Religious Emphasis (F(2,110)=7.278) p=<.001	.002**	.001***	.899
Control (F(2,110)=4.009) p=<.021	.007**	.083	.366

*p<.05
**p<.01
***p<.001

CHAPTER V

DISCUSSION

This final chapter presents a discussion of the results related to the testing of each of the five null hypotheses. An attempt was be made to integrate the findings of the investigation with the existing literature reported in Chapter II. Following this discussion, a general discussion of the results and implications for further research is be presented.

The investigation described here was designed to examine the cognitive and affective variables related to the performance of mathematically talented children across three cultural groups. That is to say, that the overall design of the study permitted the systematic exploration of possible cultural cognitive and affective differences in the attainment of academic success.

Discussion related to Null Hypothesis One

Statistical analysis of the results of this hypothesis indicated that there were no significant differences across cultural groups on the dimension of

student reported styles of thinking. Several possible explanations could account for this finding. One explanation, as Shaker (1982) suggests, is that Jungian personality typology can " reflect...non-occidental sensitivities". This suggests that possibly there are no cultural biases in this construct. Further, it could suggest that there are truly no thinking styles differences across culture.

A second possible explanation runs contrary to the first explanation and refutes the universality of personality typology. This explanation suggests that the construct of thinking styles has no validity in Japanese culture. As Kashawagi (1986) states, the "relationship of internality to high academic achievement, consistently positive in the U.S., is not appreciable in Japanese students." Again, as Ryckman (1988) reports, Japanese students scored higher on the external end of the scale than American students.

A factor that may have influenced the outcome related to testing this hypothesis may have to do with the response style of the Japanese and Japanese-American students. Several observers have suggested that the forced choice format and the fact that there

is no correct answer on the MMTIC may have a bearing on the results of this test. These observers suggest that Japanese students will not perceive the test items as having face validity and meaning to them. Therefore, the results of this test may have be subject considerable to random responding among the samples.

Discussion Related to Null Hypothesis Two

The statistical analysis related to the testing of the second null hypothesis indicated that there were significant differences on six of the thirty questions on the Study Habits Survey. The results of the survey, as with the results in the rest of this investigation, need to be tempered with the possibility that of the self-effacing nature of the Japanese and Japanese-American subject responses may have confounded the results. For example, on question two, American students reported playing the radio more often than their Japanese counterparts. This finding is not surprising and may suggest the possibility of a learning style difference. It is interesting to recall the research on classroom environment which points out the significant differences between the two cultures.

As Stevenson et.al. (1986) reported, American students engage in more inappropriate behaviors (i.e., talking out etc.) in the classroom, which, when extrapolated, suggests that American classrooms may have higher levels of extraneous noise.

Question four, relating to desk organization, highlighted differences between the cultural groups. Both American and Japanese-American students rated this item higher than Japanese students. Again, this question is related to perception. It is possible that Americans over-rate the neatness of their desk as well as Japanese under-rating their desk organization.

The results of question ten, relating to taking notes to prepare for class, was different from the trend. The Japanese-American students rated this item lower than both Japanese and American students. Again, American students rated this item higher.

Questions thirteen and fourteen relate to interfering factors to school success. Japanese students indicated that friends interfered with school success more than Japanese-American students. Americans reported that they spent too much time involved in "fun" after-school activities than both

Japanese-American and Japanese students.

Question twenty-four relates to studying more for subjects for which the students highly cares. Japanese-American students rated this item significantly higher than their American counterparts.

It is interesting to note the pattern emerges on most of the other questions of the Study Habits Survey. Most of the questions are highly endorsed by the American students. The Japanese students mean responses tend to be lower while the Japanese-American student mean responses fall between the two. Given the literature involving the ratings of both Japanese and American students, this pattern seems consistent. It would seem implicit that the Japanese-American students would fall somewhere in-between.

Discussion related Null Hypothesis Three

Statistical analysis of null hypothesis three suggested that were significant relationships between student, parent, and teacher ratings of self-concept across cultural group. The general trend for five of the scales shows American rating of self concept higher than Japanese-American and Japanese students. This

same trend was noted for parent ratings of student self-esteem. The Japanese-American teacher ratings of student self-esteem were found to be higher than the other groups on five of the six scales. Japanese teacher ratings appeared to be the lowest on most of the scales.

The findings related to student ratings of self-concept support Lerner et. al. (1980) who reported that Japanese adolescents indicated lower ratings of self-esteem and less favorable views of body attractiveness. This does not mean that Japanese students have lower self-esteem but, as Kashawagi (1986) reports, that negative evaluation is pointed to as one of the general characteristics of self-concept for Japanese. As indicated above, the Japanese-Americans' ratings, for the most part, fell between the other two groups. This finding parallels those reported by Pang et. al.(1985) study who found that Asian-American children do not feel as positive about their physical characteristics as do their white peers, despite enculturation. Despite not rating themselves as high as the American group, it is interesting that these students rated themselves higher on this variable than their Japanese

counterparts.

In analyzing the results of the American raters' reports of self-concept, Coleman and Fults' (1982) suggestion of social comparison theory is important. American student and teacher ratings appear to be the most similar, while American parents tended to rate their student's self-concept higher. Both the students and teachers are exposed to the same comparison framework of the classroom which is not available to the parents. This could account for some of the similarity of ratings for the students and teachers.

Discussion related to Null Hypothesis Four

Statistical analysis of the scores obtained on the Family Environment Scale and the Piers-Harris Scale indicated suggested that there were significant relationships between ratings of family environment and self-concept. It is interesting to note that more significant relationships were found for the Japanese students and fewer significant relationships were found for the Japanese-American and American students.

The FES scales that seemed to have the most significant relationship between the FES scale scores

and with the self-concept scale scores for the Japanese students were on the Cohesion and Organization sub-scales. This finding supports White (1985) who reports that Japanese mothers emphasized earlier monitoring skills which demonstrated "self-control, compliance with adult authority and social courtesy." Additionally, the process of "amae" is brought to mind here. As Miyake et. al. (1986) state, Japanese mothers urge "amae", or perfect oneness, by fostering the self-indulgent tendency to "expect the help and support of individuals and groups close to him or her." As suggested in the literature review, Japanese families do not stress the independence and autonomy of the individual, but rather, they stress that the individual is superseded by the family. Reviewing the discipline strategies employed by Japanese families, Weiscz (1984) reports that Japanese children are taught to value close alignment with family members by threat to this contiguity of that alignment. The results of the present study seem to support these views offered by others.

For the Japanese-American students, the Conflict scale scores were found to be related with self-

concept. The negative correlational relationship between conflict and the self-concept scales supports the process of "wakaraseru"(White and Levine, 1986). This is the process of engaging a child in the goals the mother has set, which seem to never to go against the child. The presence of conflict would apparently jeopardize "wakaraseru" and the feeling of "amae" between the student and family.

However, for American students, the results are not clear cut. Negative correlational relationships were found between Conflict and the Behavior, Intellectual/ School Status, and Happiness/ Satisfaction scales of the Piers-Harris Scale. This is not surprising because, as Matthews (1986) states, families with gifted children demonstrate high levels of functioning "...in terms of...affective responses,...(and) behavior control."

The Expressiveness scale of the FES was significantly related to the Anxiety and Popularity scales of the Pier-Harris. Again, this is not a surprising finding. These results suggest the students from "expressive" families report lower levels of anxiety and report being more popular.

Discussion related to Null Hypothesis Five

Statistical analysis of the results related to null hypothesis five indicated that there were significant differences on five of the ten scales on the Family Environment Scale. Of these scales, the American group had significantly higher means than Japanese-American and Japanese students on Cohesion, Active-Recreational Orientation, and Moral-Religious Emphasis. An explanation for the American score is suggested by Matthew (1986) who stated, "... families with gifted children indicate a higher level of adjustment...and general functioning." This finding, in combination for the propensity for the possible underestimate of ratings by Japanese and Japanese-American responses, helps to account for this result.

The results of the Active-Recreational Orientation scale are not truly surprising in that the Japanese students may have limited opportunities for these types of activities. With the emphasis on homework and juku, opportunities for recreation may be limited. In the United States, involvement in extra-curricular activities is a valued experience. Neither the American or Japanese-American populations significantly

differed on this scale.

Caution is urged when reviewing the results of the Moral-Religious Emphasis scale. This scale tends to reflect the values of western culture, with a particular emphasis on Judeo-Christian religion. This scale, even in its translated form, may not be fully sensitive to Japanese traditions.

Two surprising results were observed on the Expressiveness and Control Scales. The Japanese-American students had a higher mean score than the American students. This scale tends to measure the extent to which family members are encouraged to act openly and directly express their feelings. Despite what Mordkowitz (1986) reports about Asian-American families having lower verbal activity, there apparently is an emphasis on expressing feelings and emotions in this limited sample of Japanese-American students. Perhaps, the channel of expression is non-verbal as opposed to verbal methods.

The other rather surprising finding are the results related to the Control scale. The American students reported a higher mean score than the Japanese-American students. This scale measures the

extent to which the rules and procedures are clearly present in a family. Colangelo (1983) reports that parents of gifted children (in the U.S.) are more inclined to allow freedom to children in choosing their friends, making decisions, and encouraging creative interests. He also reports that fathers of gifted children tend to be more permissive. Additionally, Rimm (1988) reports that 95% of her sample of gifted children felt they could manipulate their parents. The findings reported here do not seem to be congruent with the literature on American families reported elsewhere.

Summary and Suggestions for Further Research

Overall, the results of this investigation suggest that there are differences in some of the ratings of study skills, self-concept, and family environment across cultures. The significant pattern of responding that emerged is one that supports the hypothesized pattern suggested from the literature.

The American ratings tended to be highest, with the Japanese ratings lower, and the Japanese-American ratings falling between the two extremes. It must be reiterated that these findings should be tempered due

to the general tendency for American subjects to rate themselves higher than their Japanese counterparts. However, it is particularly interesting to note that the Japanese-Americans' ratings fell between the two groups. The possible blending of the two cultures is compatible with the findings reported here.

Another finding, which could lead to other further research, is the trend of similarity among the three groups. Differences in learning style and some study skills across groups failed to be detected here. However, further investigation designed to test these other possible differences needs to be conducted in order to rule out type II error. Finding a difference in learning styles, study skills, and excellence in mathematical ability across cultures would permit focus on other intervening variables (e.g. teacher variables, parent-school communication, etc.).

Taken as a whole, the results of this investigation suggest many other directions for further research. Further validity and reliability studies need to be performed in order to validate the translations of the research instruments and the constructs that they represent.

These findings have spawned an interest in another variable that was not included in the study reported here. The role of parental support of education and home-school communication is another area that requires further study. It would be of interest to investigate the role of these variables in the attainment of academic success across cultures.

This study focused specifically on male subjects in order to control for any effects related to sex. It would be interesting to expand the design of this study to included females in an attempt to systematically address any possible questions related to sex differences across culture. The study reported here was designed to focus only on the mathematically talented subjects. It might be beneficial to include subjects who are "average" and, more importantly, students who are experiencing difficulties in school. This approach could assist us in the determination of additional factors that maybe are related to academic excellence across cultures.

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APPENDIX A

Dependent Variable:Behavior

American Student
Squared Multiple R:.288

Variable	Beta	t	P-value
Cohesion	.299	- .912	.368
Expression	-.040	- .607	.832
Conflict	-.359	-1.742	.091
Independence	.013	- .082	.935
Achievement	-.058	- .323	.748
Intellectual/Cultural	.070	.296	.769
Active/Recreational	-.199	- .827	.414
Moral Religious	.230	1.266	.214
Organization	-.158	- .695	.492
Control	.143	.699	.489

Japanese American

Squared Multiple R:.518

Variable	Beta	t	P-value
Cohesion	.181	.704	.489
Expression	.193	.941	.358
Conflict	-.516	-2.833	.010
Independence	-.067	- .338	.739
Achievement	.609	2.731	.013
Intellectual/Cultural	.186	.573	.365
Active/Recreational	-.056	- .274	.787
Organization	-.222	-1.228	.233
Control	-.214	-1.256	.223

Japanese
Squared Multiple R:.601

Variable	Beta	t	P-value
Cohesion	.306	1.654	.114
Expression	-.032	-.163	.872
Conflict	-.023	-.142	.889
Independence	.125	.677	.506
Achievement	.042	.511	.615
Intellectual/Cultural	-.221	-.918	.370
Active/Recreational	.225	1.291	.212
Moral Religious	-.170	-.808	.429
Organization	.623	3.725	.001
Control	-.177	-.919	.369

Dependent Variable:Intellectual/School Status

American
Squared Multiple R:.222

Variable	Beta	t	P-value
Cohesion	-.002	-.007	.994
Expression	-.078	-.394	.696
Conflict	-.154	-.715	.480
Independence	.080	.480	.634
Achievement	-.169	-.904	.373
Intellectual/Cultural	-.253	-1.023	.314
Active/Recreational	.267	1.064	.294
Moral Religious	.006	.032	.975
Organization	.218	.920	.364
Control	-.285	-1.330	.193

Japanese-American
Squared Multiple R:.395

Variable	Beta	t	P-value
Cohesion	-.101	-.353	.728
Expression	.216	.939	.359
Conflict	-.496	-2.426	.024
Independence	.167	.753	.460
Achievement	.385	1.542	.138
Intellectual/Cultural	.163	.776	.446
Active/Recreational	.010	.047	.963
Moral Religious	.317	1.380	.182
Organization	-.161	-.794	.436
Control	-.287	-1.550	.148

Japanese
Squared Multiple R:.612

Variable	Beta	t	P-value
Cohesion	-.402	2.025	.039
Expression	-.144	-.735	.471
Conflict	-.070	-.432	.670
Independence	-.000	-.002	.999
Achievement	.264	1.482	.154
Intellectual/Cultural	-.190	-.801	.433
Active/Recreational	.376	2.185	.041
Moral Religious	-.068	-.326	.748
Organization	.483	2.929	.008
Control	-.100	-.525	.605

Dependent Variable:Physical Attractiveness/Attributes

American
Squared Multiple R:.252

Variable	Beta	t	P-value
Cohesion	.085	.253	.802
Expression	.074	.382	.705
Conflict	.241	1.139	.263
Independence	-.189	-1.156	.256
Achievement	.082	.446	.659
Intellectual/Cultural	-.097	-.397	.693
Active/Recreational	.150	.609	.546
Moral Religious	.306	1.643	.110
Organization	.109	.468	.643
Control	-.356	-1.694	.100

Japanese-American
Squared Multiple R: .400

Variable	Beta	t	P-value
Cohesion	- .155	-.543	.593
Expression	.146	.640	.529
Conflict	- .548	-2.693	.014
Independence	.087	.394	.698
Achievement	.066	.264	.794
Intellectual/Cultural	.139	.662	.515
Active/Recreational	.081	.361	.721
Moral Religious	.133	.580	.568
Organization	- .024	-.119	.906
Control	- .256	-1.347	.192

Japanese
Squared Multiple R:.521

Variable	Beta	t	P-value
Cohesion	.468	2.306	.032
Expression	-.243	-.113	.279
Conflict	.046	.255	.801
Independence	-.283	-1.392	.179
Achievement	.344	1.733	.098
Intellectual/Cultural	-.082	-.311	.759
Active/Recreational	.453	2.373	.028
Moral Religious	-.075	-.323	.750
Organization	.337	1.837	.081
Control	-.280	-1.324	.200

Dependent Variable: Anxiety

American
Squared Multiple R: .330

Variable	Beta	t	P-value
Cohesion	.331	1.040	.306
Expression	.294	1.605	.118
Conflict	.295	1.476	.150
Independence	-.050	-.324	.748
Achievement	.006	.034	.973
Intellectual/Cultural	-.035	-.154	.878
Active/Recreational	.046	.199	.843
Moral Religious	.187	1.058	.298
Organization	-.106	-.480	.365
Control	-.300	-1.507	.141

Japanese-American
Squared Multiple R:.209

Variable	Beta	t	P-Value
Cohesion	-.112	-.340	.737
Expression	-.023	-.087	.931
Conflict	-.230	-.983	.337
Independence	.123	.484	.634
Achievement	.279	.977	.340
Intellectual/Cultural	-.126	-.523	.607
Active/Recreational	.341	1.328	.198
Moral Religious	.198	.753	.460
Organization	-.211	-.911	.373
Control	.026	.118	.907

Japanese
Squared Multiple R: .266

Variable	Beta	t	P-value
Cohesion	.255	1.014	.322
Expression	-.100	-.371	.714
Conflict	-.165	-.739	.469
Independence	-.008	-.031	.975
Achievement	.297	1.211	.240
Intellectual/Cultural	-.211	-.646	.526
Active/Recreational	.112	.472	.642
Moral Religious	.071	.251	.805
Organization	.216	.951	.353
Control	-.358	-1.368	.186

Dependent Variable: Popularity

American
Squared Multiple R: .133

Variable	Beta	t	P-value
Cohesion	.171	.474	.639
Expression	.309	1.483	.148
Conflict	.180	.792	.434
Independence	.038	.215	.831
Achievement	-.075	-.379	.707
Intellectual/Cultural	-.005	-.018	.986
Active/Recreational	.001	.002	.986
Moral Religious	-.025	-.123	.903
Organization	-.223	-.890	.380
Control	.047	.210	.835

Japanese-American
Squared Multiple R: .287

Variable	Beta	t	P-value
Cohesion	-.096	-.307	.762
Expression	-.190	-.761	.455
Conflict	-.404	-1.818	.083
Independence	.258	1.068	.298
Achievement	-.134	-.494	.626
Intellectual/Cultural	.026	.116	.909
Active/Religious	.001	.005	.996
Moral Religious	-.006	-.025	.980
Organization	.086	.391	.700
Control	-.140	-.673	.508

Japanese
Squared Multiple R:.398

Variable	Beta	t	P-value
Cohesion	.351	1.547	.138
Expression	-.047	-.193	.849
Conflict	.118	.581	.568
Independence	-.251	-1.104	.283
Achievement	.294	.132	.200
Intellectual/Cultural	.139	.470	.644
Active/Recreational	.327	1.529	.142
Moral Religious	-.054	-.209	.836
Organization	.209	1.106	.322
Control	-.210	-.887	.386

Dependent Variable:Happiness/Satisfaction

American
Squared Multiple R: .432

Variable	Beta	t	P-value
Cohesion	-.183	-.626	.535
Expression	.132	.784	.438
Conflict	-.436	-2.369	.024
Independence	-.105	-.738	.466
Achievement	.011	.069	.946
Intellectual/Cultural	.258	1.220	.231
Active/Recreational	.030	.138	.891
Moral Religious	.315	1.940	.061
Organization	-.063	-.311	.758
Control	-.086	-.471	.641

Japanese-American
Squared Multiple R:.243

Variable	Beta	t	P-value
Cohesion	.187	.582	.567
Expression	-.190	-.739	.468
Conflict	-.232	-1.017	.321
Independence	.081	.324	.749
Achievement	.027	.098	.923
Intellectual/Cultural	-.036	-.153	.880
Active/Recreational	-.005	-.019	.985
Moral Religious	.218	.848	.406
Organization	-.180	-.797	.434
Control	-.179	-.837	.412

Japanese
Squared Multiple R:.461

Variable	Beta	t	P-value
Cohesion	-.407	1.892	.073
Expression	-.260	-1.124	.274
Conflict	-.173	- .905	.376
Independence	-.347	-1.613	.122
Achievement	.352	1.677	.109
Intellectual/Cultural	.152	.543	.593
Active/Recreational	.256	1.264	.221
Moral Religious	-.291	-1.191	.247
Organization	.337	1.732	.099
Control	-.382	-1.704	.104

Appendix B

Dependent Variable:Behavior

Variable	A	JA	J
Cohesion	.322	.357	.430
Expression	.095	.238	.130
Conflict	-.433	-.428	-.249
Independence	.158	.217	.326
Achievement	-.063	.026	-.020
Intellectual/Cultural	.179	.274	.200
Active/Recreational	.068	.356	.309
Moral Religious	.288	.046	.038
Organization	.220	-.007	.641
Control	.023	-.153	-.055

Dependent Variable: Intellectual/School Status

Variable	A	JA	J
Cohesion	.221	.277	.514
Expression	.080	.213	.062
Conflict	-.288	-.379	-.211
Independence	.105	.195	.277
Achievement	-.207	-.016	.120
Intellectual/Cultural	.074	.262	.266
Active/Recreational	.165	.209	.420
Moral Religious	.057	.288	.196
Organization	.200	-.001	.585
Control	-.250	-.083	.088

Dependent Variable:Physical Attractiveness/Attributes

Variable	A	JA	J
Cohesion	.099	.205	.497
Expression	.248	.194	.048
Conflict	.037	-.486	-.091
Independence	-.185	-.014	.016
Achievement	-.057	-.317	.060
Intellectual/Cultural	.197	.128	.229
Active/Recreational	.170	.264	.422
Moral Religious	.266	.103	.256
Organization	.150	-.081	.397
Control	-.229	-.406	-.002

Dependent Variable: Anxiety

Variable	A	JA	J
Cohesion	.284	.015	.296
Expression	.410	-.072	.121
Conflict	-.027	-.231	-.297
Independence	.103	.204	.146
Achievement	.081	.045	.077
Intellectual/Cultural	.255	-.028	.095
Active/Recreational	.325	.239	.124
Moral Religious	.271	-.005	.131
Organization	.151	-.179	.222
Control	-.185	.036	-.227

Dependent Variable: Popularity

Variable	A	JA	J
Cohesion	.062	.020	.474
Expression	.249	-.130	.225
Conflict	.137	-.448	-.033
Independence	.040	.192	.050
Achievement	-.095	-.160	.059
Intellectual/Cultural	.070	.014	.384
Active/Recreational	.045	.152	.409
Moral Religious	-.015	-.087	.344
Organization	-.061	-.069	.309
Conflict	-.044	-.128	-.040

Dependent Variable: Happiness/Satisfaction

Variable	A	JA	J
Cohesion	.272	.241	.430
Expression	.279	-.051	.078
Conflict	-.451	-.365	-.321
Independence	-.027	-.049	.013
Achievement	-.074	-.216	-.002
Intellectual/Cultural	.401	-.038	.219
Active/Recreational	.181	.126	.242
Moral Religious	.411	.220	.116
Organization	.237	-.168	.389
Control	-.261	-.215	-.167

APPENDIX C

STUDY SKILLS QUESTIONNAIRE

True all of the time=4
True almost all of the time=3
True some of the time=2
True none of the time=1

Each cell contains the mean on top and the standard deviation below.

	A	JA	J
1. I like to study while watching t.v.	1.727 0.817	1.592 0.814	1.943 0.110
2. I play the radio while I study.	1.614 0.920	1.265 0.605	1.029 0.169
3. I have a special place (desk or table) at which I like to study.	3.159 0.963	3.633 0.809	3.429 0.778
4. My desk at school is neatly organized.	2.955 0.963	2.776 1.177	2.036 1.621
5. I remember to bring my homework.	3.523 0.590	3.347 0.925	3.40 0.736
6. When I read, I underline or mark things.	2.045 0.963	1.673 0.774	1.714 0.957
7. I outline main points when reading.	1.795 0.878	2.082 1.134	2.114 1.078
8. I look up things I don't understand.	2.727 0.924	2.082 1.000	2.114 0.974
9. When I don't understand something, I read it over and over.	2.909 0.858	2.469 1.043	2.914 1.040
10. I take notes to prepare for class.	2.091 1.007	1.449 0.542	2.000 2.100
11. When I take notes, I put in my own ideas.	2.535 1.162	1.854 0.945	2.194 1.167
12. I like to study with others rather than by myself.	2.233 1.020	2.875 1.160	2.528 1.207
13. My friends interfere with my school success.	1.581 0.932	1.340 0.731	1.833 0.941
14. I spend too much time doing "fun" after-school activities.	2.163 0.898	1.522 0.913	1.556 0.735

15. I stop studying earlier to see friends.	1.930 0.884	2.447 1.138	2.111 1.141
16. I listen carefully to get the ideas of friends.	2.674 0.892	3.043 0.806	2.917 1.079
17. I sometimes daydream when studying.	1.930 0.910	1.638 0.942	1.472 0.971
18. I wait until the last minute before I start to study.	2.000 0.951	1.638 1.169	1.472 1.120
19. When I don't understand something, I study it until I do understand.	2.698 0.803	2.638 1.031	2.917 1.025
20. When there is a difficult problem, I enjoy the challenge.	2.791 1.103	3.085 1.139	3.000 1.319
21. I try to get good grades for myself.	3.773 0.605	3.319 0.862	3.371 0.877
22. It is easy for me to concentrate on my homework.	2.909 0.802	2.809 0.924	2.800 1.132
23. I often get nervous when taking a test.	2.000 0.940	2.809 1.071	2.800 1.278
24. I will study more for subjects that I like.	2.750 1.037	3.362 0.987	3.118 1.038
25. I feel very excited when I get a test.	2.545 1.088	2.383 1.153	2.853 1.105
26. I check over all my work before I turn it in.	2.409 0.923	2.043 0.932	2.257 1.067
27. Taking tests doesn't bother me.	2.727 1.188	2.979 1.073	2.971 1.175
28. I try to get good grades for my parents.	3.186 1.075	2.630 1.218	2.714 1.250
29. I try harder for teachers that I like.	2.227 1.236	2.435 1.223	2.229 1.262
30. I often forget things when I get nervous.	1.977 0.792	1.830 0.860	2.057 1.056

VITA

The author, Michael J. Boyle, was born September 11, 1962 in Milton, Florida.

He received a Bachelor of Science in Psychology, with high honors, from Western Illinois University in 1983. In 1986, he received a Master of Education in School Psychology from Loyola University of Chicago. In 1986, he was admitted to the Graduate School at Loyola University of Chicago, where he pursued the Doctor of Philosophy degree in School Psychology.

After completing an internship in school psychology with Glenbard High School District 87 in 1987, he was employed by West Aurora School District 129 as a school psychologist. He is presently employed as a school psychologist with Schaumburg School District 54. Additionally, the author has worked as a part-time instructor for the College of DuPage in Glen Ellyn, teaching classes in educational psychology.

Approval Sheet

The dissertation submitted by Michael Boyle has been read and approved by the following committee:

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The final copies have been examined by the director of the dissertation and the signature which appears below verifies that fact that any necessary changes have been incorporated and that the dissertation is now given final approval by the Committee with reference to content and form.

The dissertation is therefore accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

November 4, 1991
Date

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