THE ACADEMIC ACHIEVEMENT OF ADOPTED KOREAN CHILDREN: FACTORS OF INTELLECT AND HOME EDUCATIONAL ENVIRONMENT

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LINDA A. GILDEA

Boston University, School of Education, 1992

Major Professor: Ralph Mosher Professor of: Education

ABSTRACT

The purpose of this study was to systematically examine the academic achievement of Korean children adopted by white American families, and to provide a base of empirical and descriptive information concerning this particular group of children. Specifically, the goals of this study were: (1) to assess the academic achievement of Korean children who have been adopted and reared by white American families; and, (2) to contribute to information regarding the relative influence of the following factors on academic achievement in children: family background attributes; home educational environment; intellectual ability.

Forty-three Korean children and their adoptive American parents participated in this study. The academic achievement of the children was measured by the California Achievement Test Reading and Math subtests. Family socioeconomic status was assessed using the Duncan Socioeconomic Index. Home educational environments were measured using the Henderson Home Environmental Learning Process Scale (HELPs). Intellectual ability of the children
was measured using the Wechsler Intelligence Scale for Children - Revised (WISC-R).

Regression analysis showed that: (1) the WISC-R Verbal IQ was the only significant predictor of reading achievement (Beta = .538) and accounted for twenty-nine percent of the unique variance; (2) the HELPS was the only predictor variable to have a statistically significant effect on math achievement (Beta = .404), and explained thirteen percent of the unique variance.

The findings indicate that: (1) these adopted Korean children have achieved higher than average level on standardized tests of reading and math; (2) intellectual ability and a supportive home educational environment are strong predictors of academic achievement in children; (3) family background attributes (family income, parental occupational status, birth rank) are not such strong predictive factors of children's academic achievement as previously thought.

The importance of these findings are limited due to the small sample size. Additional limitations of this study included the small geographic area in which participants resided; the selective placement of adoptees; self-selecting volunteer participants; and the unknown effects of racism. Also discussed were the possible contributing factors of high parental and teacher expectations and the special attention paid by adoptive parents to the "chosen" child.
CHAPTER THREE

RESEARCH DESIGN

The following discussion describes the sample selection, the measurement instruments, the data collection procedures, and the statistical design to be used in this study.

Sample to be Studied

The 31 participating families were recruited by letters from the International Adoption Agency to families with Korean adopted male and female children, ages 8 through 12 years old. Two thirds of the sample were identified through the adoption agency and one-third of participants (approximately 30%), were recruited through referrals from the adoptive parents. There were 12 sibling pairs within the total group. All the children were placed in their adoptive families by two years of age, with the exception of two children.

International Adoption Agency, Inc. (IAI) is a large private agency in Waltham, Massachusetts, and has been placing children from various countries for adoption throughout the New England states for over 15 years. This agency is in agreement with Holt Children’s Services in Korea which provides adoption services both at home and abroad. The Holt organization was originally started in 1955 by the late Harry Holt, an American citizen. Holt
Agency initially began as a wartime rescue effort to aid children who were orphaned by the Korean War (Register, 1991).

This study includes only Korean children primarily because Korea had been one of the few Asian countries which permitted international adoption of their children. The Philippines, Thailand, and Viet Nam have also permitted international adoptions, although on a much smaller scale.

International Adoption Agency sent approximately 30 letters to parents who had adopted Korean children (infant and toddler age) between 1976 and 1980. These families were identified through the agency files by a staff member. Of the 30 families who were eligible, 23 did respond, and 20 did participate (3 were not included because of geographic distance and scheduling problems). Eight of these families had two adopted children eligible for participation. The adopted children reared in the same home were unrelated biologically, except for one biological half-sibling pair. A copy of the solicitation letter for the study is included in Appendix E.

One of the reasons for this choice of age is that research suggests that, by the age of nine, at least 50 percent of the general achievement pattern evident at the age of eighteen, has developed (Bloom, 1964). Bloom has stated:
"... the first period of elementary school is probably the most crucial period available to the public schools for the development of general learning patterns ... [it is the] most important growing period for academic achievement ... all subsequent learning in the school is affected and in large part determined by what the child has learned by the age of nine or by the end of grade III" (p. 110).

Another reason for this selection of age is that some research indicates that the relative effects of genetic and environmental influences on the development of specific cognitive abilities remain stable during childhood (Griffiths & Phillips, 1976; Ho, Foch, & Plomin, 1981; Plomin & DeFries, 1980; Wilson, 1978;) Research findings suggest that the mixture of genetic and environmental influences on the development of individual differences in IQ stabilizes by 7 or 8 years of age. Findings from another study suggest that genetic influences on specific cognitive abilities may be less important in childhood than in adolescence (Foch & Plomin, 1981).

A crucial methodological consideration for any adoption study is the age at which the children are placed with their adopting families. Only placements of infants can guarantee that potentially confounding, early environmental
qualities of the child, and rewards for academic accomplishments.

**The Measurement Instruments**

**Academic Achievement**: The California Achievement Test, Form E, (CAT/E) is used in this research. This battery is published by the California Test Bureau/McGraw-Hill, Monterey, California, 1983 Edition.

The California Achievement Test, Form E is a norm-referenced test for kindergarten through Grade 12. It is a series of tests designed to measure achievement in basic academic skills commonly found in state and district curricula.

The complete battery consists of ten subtests measuring seven content areas: reading, spelling, language, mathematics, study skills, science, and social studies. Primarily for reasons of time, only two subtests, Reading Comprehension and Mathematics Concepts and Applications, were used to measure academic achievement. It was recommended by an educational testing specialist that these two tests are the most useful and reliable predictors of achievement. Reliabilities for the content areas in reading and math are in the .80-.95 range. (Peterson, 1985; Rosenbach, 1985).

The Reading Comprehension subtest contains 55 items that measure comprehension of reading passages. Items test
the student's ability to extract details, analyze characters, identify main ideas, and interpret events described in passages. Items in the reading subtest are well planned and well written to measure the student's ability and skill for reading comprehension (Bryan, 1985; peterson, 1985).

Mathematic Concepts and Applications subtest contains 55 items that measure understanding of mathematics concepts. Specific skills include numeration, number sentences, number theory, problem solving, measurement and geometry. The items in the mathematics subtest at the various levels provide comprehensive coverage of the entire school program in general mathematics, including representation of the "new" mathematics (Bryan, 1985; Peterson, 1985).

Results are available in raw scores, scale scores, grade equivalents, percentiles and stanines. Results are also available as anticipated achievement scores, when the battery is given in conjunction with the Test of Cognitive Skills.

Content validity is claimed, based upon item construction that reflects educational objectives commonly found in current state and district curriculum guides, published texts and instructional programs, and criterion-referenced assessment instruments.
The standardization procedure was based on a large national sample in Grades K through 12. The sample was stratified in terms of public and Catholic schools, geographic region, community type (urban, suburban, rural), district size (average elementary grade enrollment) and a demographic index based on community characteristics related to district achievement. The norming was conducted in the fall of 1984 and the spring of 1985.

**Intellectual Ability:** The Wechsler Intelligence Scale for Children-Revised (WISC-R), 1974 edition was used to measure intellectual performance. The WISC-R is a basic individual examination with verbal and performance tests to assess a child's capacity to understand and cope with the world. The two scales, Verbal and Performance, reflect the principal ways in which human abilities are expressed. The verbal scales measure the child's understanding of verbal concepts and his or her ability to respond orally. The performance scales measure the child's ability to solve problems requiring the manipulation of objects or other manual responses. The reliability coefficients for the Verbal IQ Scale is .94, the Performance IQ Scale is .90 and the Full IQ Scale is .96.

**Family Background Variables:** A family background questionnaire included parental education, family income, birth order, family size, sibling spacing, and sibling sex.
participation in the study. A copy of this letter is included in Appendix E.

Collection of research data involved an average of approximately three hours of testing the child. Parent interviews averaged one-half hour in length. All testing of the children and interviews of the adoptive parents were done in the children’s homes. The home visits were scheduled for times that were convenient for the parents and children. The only requirement for scheduling was that the time for testing be one in which the child was alert and well rested. Consequently, most of the home visits were scheduled during midmorning. All the data were collected from June, 1989 through October, 1990. At the time of data collection there were 12 children who were recently administered the standardized achievement tests in the school. Therefore achievement test scores were obtained directly from the school reports provided by the parents.

Standardized procedures of administration and scoring were maintained throughout the measurement phase. The administration of the WISC-R and the CAT/E was conducted by one examiner who is formally trained and experienced in the use of these instruments.

The questionnaire items were administered to the parents through personal interviews.
the Henderson Home Environmental Process Scale (HELPS) factors as described in Chapter Three.

The second analysis performed was correlation and regression analysis to determine the strength and magnitude of the relations between academic achievement as measured by standardized test scores and the identified predictor variables. The primary goal of multiple regression analysis was to delineate the specific factors of intellectual ability, family background characteristics and home educational factors which are considered most useful in the prediction of academic achievement.

Descriptive Data of the Subjects and Family Characteristics

The sample contained 43 Korean children who had been adopted into Caucasian families. Most of the children (83%) were female. (The male/female ratio was expected since a vast majority of Korean adoptees are female.) The children were between 8 and 12 years of age at the time of the data collection. The average age at Wechsler Intelligence testing (WISC-R) was 10 years and 5 months (10.5). The oldest child was nearly 13 years old, while the youngest was 8 and a half; the range was 8 years, 6 months to 12 years, 7 months of age. Half of the children were 10 years, 6 months of age or younger at testing.

There were a total of 12 adoptive sibling pairs; 11 of these pairs were biologically unrelated, and 1 pair was
identified as biological half-siblings, i.e., having the same biological mother.

**Birth Order of the Children in These Families**

These children for the most part are either the oldest or second child in the family. Forty-four percent of the children (19/43) are the oldest; another 40%, or 17 children, rank second in birth order. Approximately 12% (5/43) were identified as an only child in the family.

**Age of Placement in Adoptive Homes**

The average age of placement in the adoptive homes was 7 months of age. In fact, 74% of the children were placed with their adoptive families by 9 months of age. Ages of adoption ranged from a little more than a month (1.2 months) to 4 years.

**Family Background Characteristics**

The subjects in this sample included 43 children from 31 families. The discussion below describes the 31 families and sets of parents.

**Parent's Education**

As Table 4 and 5 show, the adoptive parents of these children are well educated. Twenty-three in 31 fathers (74%) and more than 2 in 3 mothers (68%) were at least college graduates. Almost a third of the fathers (9/31) had earned a graduate degree. Almost all of the parents had at
least some college (97% of the fathers, 30/31, and 94% of the mothers, 29/31).

Table 4. FATHER’S EDUCATION

Father's Education

<table>
<thead>
<tr>
<th>Level of Education</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>H.S. Grad</td>
<td>0.0</td>
</tr>
<tr>
<td>Some Coll</td>
<td>0.1</td>
</tr>
<tr>
<td>Coll Grad</td>
<td>0.2</td>
</tr>
<tr>
<td>Some Grad</td>
<td>0.2</td>
</tr>
<tr>
<td>Grad Deg</td>
<td>0.4</td>
</tr>
</tbody>
</table>
Parent's Occupation

Most of the fathers, 28 in 31, or 81%, worked as professionals or managers. Occupations for the fathers varied from hair stylist, carpenter, teacher, manager, accountant, to engineer. The typical occupations of the fathers were engineers and teachers. As for the mothers, 16/31, or 51%, had professional positions, while over a quarter (9/31) held clerical or service positions, and approximately 20% (6/31) were unemployed. Mothers’ occupations included secretary, office manager, insurance
broker, nurse, teacher's aide, teacher and librarian. Most of the mothers were typically employed as secretaries and teachers.

**Family Income**

Most of the families were double income families, with 25 of 31 families having both parents work outside of the home. Two of these families chose not to report income levels. Family incomes ranged from between $20,000 and $30,000 to over $100,000. The median family income was a little more than $50,000. Almost a quarter of the families (7/29) had incomes between $50,001 and $60,000. The next most frequent income range was between $40,001 and $50,000 (6/29).

**Family Size**

Family size ranged from a total of 3 individuals or one child, to 7 people or 5 children. The average family size was 4.3 people, or 2.4 children. More than half were families of four (15/31).

**How well do Korean children reared in Caucasian families perform in school?**

As Table 6 shows, the adopted Korean children in this sample have higher achievement scores compared to the rest of the population on the CAT/E Reading Comprehension and the CAT/E Math Concepts and Application Tests.
Table 6. DISTRIBUTION OF ACHIEVEMENT SCORES

<table>
<thead>
<tr>
<th>Stanines</th>
<th>Approx. %tiles</th>
<th>Norm % of Students</th>
<th>% of Korean Students Reading (N=39)</th>
<th>% of Korean Students Math (N=38)</th>
</tr>
</thead>
<tbody>
<tr>
<td>9 Highest Level</td>
<td>96-99</td>
<td>4%</td>
<td>31%</td>
<td>40%</td>
</tr>
<tr>
<td>8 High Level</td>
<td>90-95</td>
<td>7%</td>
<td>21%</td>
<td>11%</td>
</tr>
<tr>
<td>7 Well Above Avg.</td>
<td>78-89</td>
<td>12%</td>
<td>10%</td>
<td>32%</td>
</tr>
<tr>
<td>6 Slightly Above Avg.</td>
<td>60-77</td>
<td>17%</td>
<td>26%</td>
<td>8%</td>
</tr>
<tr>
<td>5 Average</td>
<td>41-59</td>
<td>20%</td>
<td>5%</td>
<td>3%</td>
</tr>
<tr>
<td>4 Slightly Below Avg.</td>
<td>23-40</td>
<td>17%</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3 Well Below Avg.</td>
<td>11-22</td>
<td>12%</td>
<td>5%</td>
<td>-</td>
</tr>
<tr>
<td>2 Low Level</td>
<td>5-10</td>
<td>7%</td>
<td>3%</td>
<td>3%</td>
</tr>
<tr>
<td>1 Lowest Level</td>
<td>1-4</td>
<td>4%</td>
<td>-</td>
<td>5%</td>
</tr>
</tbody>
</table>

Standardized Achievement Test Results: California Achievement Test - Form E (CAT/E)

CAT/E - Reading Comprehension

Over half of the children (52% or 20/39) scored on the 90th percentile or better on the CAT/E reading subtest. Thirty-five in 39 scored in the 56th percentile or better. In other words, 90% of these Korean adopted children did better than approximately half of the general population. On average, these children scored in the 79th percentile.

CAT/E Math

Half of the children in the sample scored in the 86th percentile or better; that is, half of the Korean children were in the top 14% of the CAT/E Math scores. Furthermore, 32 in 38 children, or 84% scored in the 71st percentile or better. On average, they scored in the 77th percentile.
The distributions of the adopted children's scores tended much higher than those of the standardized sample. In the standardized sample, 20% of the children tested had an average score which fell within the 41st and 77th percentiles. Only 5% and 3% of the Korean children had scores that were average on the Reading and Math section respectively. While, in general, 4% of the test population should score at the highest level, 31% of the Korean children scored at the highest level in Reading and 40% scored at the highest level in Math. The Reading scores for 88% of the Korean children were slightly above average or better (stanine of 6 or more), while 91% of the Korean children had Math scores which were above average or better. This is compared to 40% with a stanine of 6 or better expected for each test.
How do the IQ test scores of the Korean children compare with the standardized sample?

**Intellectual Ability: WISC-R**

"In any of the WISC-R Verbal, Performance or Full scales, distributions have a mean of 100 and a standard deviation (SD) of 15. An IQ of 100 on any of the Scales defines the performance of the average child of a given age on that scale." (Wechsler Intelligence Scale for Children - Revised p. 26)

Table 7 presents the population average and standard deviations based around a normal curve, and the IQ test results of the Korean children. Also, to compare the sample WISC-R scores with the population norms a one-tailed t-test was computed to test the significance of the apparent difference in the means. The t-values are listed below in Table 7.

### Table 7. WISC-R IQ MEAN TEST SCORES

<table>
<thead>
<tr>
<th></th>
<th>Verbal</th>
<th>Performance</th>
<th>Full</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Standard Sample</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>100.00</td>
<td>100.00</td>
<td>100.00</td>
</tr>
<tr>
<td>SD</td>
<td>15.00</td>
<td>15.00</td>
<td>15.00</td>
</tr>
<tr>
<td><strong>Korean Sample</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>120.42</td>
<td>118.74</td>
<td>122.00</td>
</tr>
<tr>
<td>SD</td>
<td>12.72</td>
<td>13.15</td>
<td>12.22</td>
</tr>
<tr>
<td>t-Value</td>
<td>10.53*</td>
<td>9.32*</td>
<td>11.83*</td>
</tr>
</tbody>
</table>

* Probability < .001
Table 8. BAR GRAPH OF WISC-R MEAN SCORES.

WISC-R MEAN SCORES
Korean vs Standardized Sample

The average child has a mean score of 100 on any of the three WISC-R scales. About 2/3's of the children of a given age score between 85 and 115, while almost 95% between 70 and 130. Almost all obtain scores between 55 and 145.

Table 7 shows that the mean Verbal IQ score for the adopted children in the study is 120.49, for the Performance IQ, 118.74, and the Full Scale IQ is 122, higher by around 20 points than the standardized average. These children do better on this test, and given the smaller standard deviation, tend to score closer to this higher mean.
Table 9. WISC-R IQ CLASSIFICATION

<table>
<thead>
<tr>
<th>IQ Score</th>
<th>Classification</th>
<th>Theoretical</th>
<th>Korean</th>
<th>Theoretical</th>
<th>Korean</th>
<th>Theoretical</th>
<th>Korean</th>
</tr>
</thead>
<tbody>
<tr>
<td>120-129</td>
<td>Superior</td>
<td>2.2</td>
<td>30.8</td>
<td>3.2</td>
<td>27.5</td>
<td>2.2</td>
<td>25.7</td>
</tr>
<tr>
<td>110-119</td>
<td>High Average (Bright)</td>
<td>6.7</td>
<td>30.2</td>
<td>6.7</td>
<td>30.2</td>
<td>6.7</td>
<td>30.2</td>
</tr>
<tr>
<td>100-109</td>
<td>Average</td>
<td>16.1</td>
<td>20.9</td>
<td>16.1</td>
<td>18.4</td>
<td>16.1</td>
<td>16.1</td>
</tr>
<tr>
<td>90-99</td>
<td>Low Average (Dull)</td>
<td>50.0</td>
<td>11.0</td>
<td>50.0</td>
<td>25.4</td>
<td>50.0</td>
<td>13.6</td>
</tr>
<tr>
<td>70-79</td>
<td>Borderline</td>
<td>16.1</td>
<td>2.3</td>
<td>16.1</td>
<td>2.3</td>
<td>16.1</td>
<td>2.3</td>
</tr>
<tr>
<td>69 and below</td>
<td>Mentally Deficient</td>
<td>2.2</td>
<td>2.2</td>
<td>2.2</td>
<td>2.2</td>
<td>2.2</td>
<td>2.2</td>
</tr>
</tbody>
</table>

*Theoretical Normal Curve percent information from page 26 of WISC-R manual.

Table 9 indicates that more Korean adopted children have higher WISC-R IQ scores than the general population. Of the Korean adopted children, 72.4% had either Superior or Very Superior (above 120) WISC-R Full IQ scores, as compared to 8.9% of the standardized normal curve (or 9.7% in the actual sample).

In theory, half the sample should have a score between 90 and 109 points (an average score) in each of the three areas (the actual standardized sample had 49.4%). In each of the three areas, fewer than half of the Korean children scored average: 21% in the Verbal, 25.6% in the Performance, and 13.8% in the Full Scale. However, over 50% scored Superior or better (over 120 points) on the three tests (Verbal, 55.7%; Performance, 53.4%; and Full, 72.4%). Furthermore, most of the Korean children scored better than High Average or Bright (above 110 points): 76.6% had High Average or better Verbal scores, 72% had High Average or better Performance scores, and 84.0% had High Average or better WISC-R Full IQ scores. These Korean children tend to do better on these tests and have higher scores.
Table 10 shows the mean scores for each of the subtests included in the WISC-R. The average level of test performance for children of a given age (within 4 months of age difference) is 10.

Table 10. WISC-R SUBTEST MEAN SCORES

<table>
<thead>
<tr>
<th>Verbal Scale</th>
<th>Mean</th>
<th>Performance Scale</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information</td>
<td>12.4</td>
<td>Picture Completion</td>
<td>12.3</td>
</tr>
<tr>
<td>Similarities</td>
<td>14.6</td>
<td>Picture Arrangement</td>
<td>12.4</td>
</tr>
<tr>
<td>Arithmetic</td>
<td>11.7</td>
<td>Block Design</td>
<td>12.8</td>
</tr>
<tr>
<td>Vocabulary</td>
<td>13.0</td>
<td>Object Assembly</td>
<td>13.2</td>
</tr>
<tr>
<td>Comprehension</td>
<td>14.3</td>
<td>Coding</td>
<td>12.7</td>
</tr>
<tr>
<td>Digit Span</td>
<td>11.4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

HELPs Summary Statistics

Below are Henderson Home Environmental Process Scale (HELPs) items which are clustered into five factors i.e., intellectual guidance and parental support for learning, identified by Kitonyi and Henderson (1980) that have been found to be predictive of children's achievement. The means and frequencies for the HELPS items which make up each factor are reported below. The HELPS questions were structured so that lower answers were more positive in terms of the educational environment.
Table 11. CORRELATIONS OF FAMILY DEMOGRAPHIC VARIABLES, AND IQ WITH ACHIEVEMENT SCORES

<table>
<thead>
<tr>
<th></th>
<th>CAT/E Reading Percentile</th>
<th>CAT/E Math Percentile</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Minimum N</strong></td>
<td>39</td>
<td>39</td>
</tr>
<tr>
<td>Birth Rank</td>
<td>.1790</td>
<td>.0369</td>
</tr>
<tr>
<td>Father's Education</td>
<td>.1715</td>
<td>.4381*</td>
</tr>
<tr>
<td>Mother's Education</td>
<td>-.1203</td>
<td>-.2591</td>
</tr>
<tr>
<td>Father's SEI</td>
<td>-.2312</td>
<td>.0058</td>
</tr>
<tr>
<td>Mother's SEI</td>
<td>-.1561</td>
<td>-.0585</td>
</tr>
<tr>
<td>WISC-R Verbal IQ</td>
<td>.2935*</td>
<td>.2870*</td>
</tr>
<tr>
<td>WISC-R Perf. IQ</td>
<td>.0785</td>
<td>.1443</td>
</tr>
<tr>
<td>Full Scale IQ</td>
<td>.2409</td>
<td>.2849*</td>
</tr>
</tbody>
</table>

* Probability < .05

The simple correlation coefficients between IQ scores and family background factors are presented in Table 12.

Table 12. CORRELATIONS OF FAMILY DEMOGRAPHIC VARIABLES WITH WISC-R IQ SCORES

<table>
<thead>
<tr>
<th></th>
<th>WISC-R Verbal IQ</th>
<th>WISC-R Perf. IQ</th>
<th>WISC-R Full IQ</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Minimum N</strong></td>
<td>43</td>
<td>43</td>
<td>43</td>
</tr>
<tr>
<td>Birth Rank</td>
<td>-.0892</td>
<td>-.0341</td>
<td>-.0753</td>
</tr>
<tr>
<td>Father's Education</td>
<td>.1536</td>
<td>.2583</td>
<td>.2394</td>
</tr>
<tr>
<td>Mother's Education</td>
<td>-.0688</td>
<td>.2049</td>
<td>.0830</td>
</tr>
<tr>
<td>Father's SEI</td>
<td>.0474</td>
<td>.2784*</td>
<td>.1829</td>
</tr>
<tr>
<td>Mother's SEI</td>
<td>.0238</td>
<td>.0888</td>
<td>.0685</td>
</tr>
</tbody>
</table>

* Probability < .05
1. As shown in Table 11, the WISC-R Verbal IQ scores correlated significantly with both reading and math achievement scores. Generally, the higher the verbal IQ, the higher scores on achievement tests.

2. The WISC-R Full Score was also correlated significantly with the CAT/E Math Percentile (r = .2849, P = .039).

3. The correlation between father's education and CAT/E Math percentile ranking was statistically significant (r = .4384, P = .003). The more years of education which the father has, the higher the child's percentile in math.

4. As Table 12 shows, the correlation between father's SEI (socio-economic status) and WISC-R Performance IQ was significant (r = .2784, P = .035). The higher the SEI of the father, the higher the Performance IQ.

5. Birth Rank (sibling order) did not correlate with achievement. Similarly, the correlation between Birth Rank and IQ is negligible.

As stated earlier, Kitonyi and Henderson (1980) identified five factors of HELPS items that have been found to be predictive of children's achievement. Although in this study, it was found that these factors, as described below, were highly correlated with one another as shown in Table 13.
Table 13. CORRELATIONS BETWEEN EACH OF THE FIVE HELPS FACTOR SCORES

<table>
<thead>
<tr>
<th></th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
<th>Factor 4</th>
<th>Factor 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factor 2</td>
<td>0.0632</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factor 3</td>
<td>-0.1440</td>
<td>0.1170</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factor 4</td>
<td>0.2942</td>
<td>0.6711**</td>
<td>0.3181</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factor 5</td>
<td>0.1922</td>
<td>0.1789</td>
<td>0.5747**</td>
<td>0.3878*</td>
<td></td>
</tr>
</tbody>
</table>

N = 43  Significance: * - .01  ** - .001

Factor 1: Extended Interest and Community Involvement
Factor 2: Valuing Language and Community Involvement
Factor 3: Intellectual Guidance
Factor 4: Providing a Supportive Environment for School Learning
Factor 5: Attention

Since the five HELPS factors were substantially correlated (as shown in Table 13), and consequently would not likely contribute much additional variance, a total HELPS score was computed based on the 21 items identified in Aitonyi's research (1980). The total score based on the unweighted sums of the items served as the measure of home educational environment used in the regression analyses below.

Regression Analyses

Several changes were made before computing the regression analyses as explained below:
1) Individual items were rescaled so that higher scores indicate more favorable practices by parents relevant to home educational climate.

2) A family SEI score was calculated which represents the higher of the father's or mother's SEI. Also an additional variable was added to indicate unemployed mothers (MOUNTEMP).

3) Since birth order, family size, and number of children in the household were all highly correlated, birth order was used.

4) Sibling pairs were included as an additional variable since the sample consisted of 12 sibling pairs which comprised half of the sample size.

Two cases were missing CAT/E scores. The subject with the lowest CAT scores was clearly an outlier. Since this girl had a diagnosed learning disability, she was dropped from the analyses.

Table 14. LIST OF VARIABLES USED IN THE REGRESSIONS

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>READING</td>
<td>CAT/E Reading Percentile Score</td>
</tr>
<tr>
<td>MATH</td>
<td>CAT/E Math Percentile Score</td>
</tr>
<tr>
<td>VERB-IQ</td>
<td>WISC-R Verbal Score</td>
</tr>
<tr>
<td>PERF-IQ</td>
<td>WISC-R Performance Score</td>
</tr>
<tr>
<td>FEMALE</td>
<td>(1=female child, 0=male child)</td>
</tr>
<tr>
<td>B-RANK</td>
<td>Birth Rank/Order</td>
</tr>
<tr>
<td>T-AGE</td>
<td>Age in years at time of achievement test</td>
</tr>
<tr>
<td>SIB PAIN</td>
<td>(1=adopted sibling in family, 0=no adopted sibling)</td>
</tr>
<tr>
<td>FAM SEI</td>
<td>Higher of father's or mother SEI</td>
</tr>
<tr>
<td>M0 UNEMP</td>
<td>(1=mother unemployed, 0=mother employed)</td>
</tr>
<tr>
<td>HELPS</td>
<td>Total HELPS score based on 21 items</td>
</tr>
</tbody>
</table>
Two regressions were estimated -- one for CAT/E Reading Percentile using WISC-R Verbal as the IQ indicator (Table 15), and another for CAT/E Math Percentile using WISC-R Performance as the IQ measure (Table 16). These tables include the regression coefficients for all the predictor variables included in the regression equations, and the proportions of variability in the achievement scores accounted for by the predictor variables included in the regression equations.

The presentation of information includes simple correlation coefficients (r's), standard error (std. er.), unstandardized partial regression coefficients (b weights), partial standardized regression coefficients (Beta weights), percent of variance (semi-partial square correlations), T-Value, and significance level (P).

The magnitude of the regression coefficient was used to determine the efficiency of the various measures for the prediction of achievement factors. The proportion of unique variance accounted for by each of the predictor variables was discussed.
Table 15. MULTIPLE REGRESSION WITH READING ACHIEVEMENT
SCORES REGRESSED ON IQ SCORES, FAMILY
CHARACTERISTICS AND HELPS

<table>
<thead>
<tr>
<th>Variable</th>
<th>( r )</th>
<th>( b )</th>
<th>Std. Er.</th>
<th>Beta</th>
<th>Semi-Partial ( r )</th>
<th>T</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>HELPS</td>
<td>.289</td>
<td>.356</td>
<td>.565</td>
<td>.109</td>
<td>.009</td>
<td>.63</td>
<td>.5335</td>
</tr>
<tr>
<td>MO UNEMP</td>
<td>.016</td>
<td>.732</td>
<td>7.487</td>
<td>.015</td>
<td>.000</td>
<td>.10</td>
<td>.9227</td>
</tr>
<tr>
<td>T-AGE</td>
<td>.046</td>
<td>-1.439</td>
<td>1.872</td>
<td>-.123</td>
<td>.013</td>
<td>-.77</td>
<td>.4479</td>
</tr>
<tr>
<td>B-RANK</td>
<td>.038</td>
<td>1.515</td>
<td>2.748</td>
<td>.084</td>
<td>.006</td>
<td>.55</td>
<td>.5853</td>
</tr>
<tr>
<td>FAM SEI</td>
<td>-.134</td>
<td>-.728</td>
<td>.399</td>
<td>-.287</td>
<td>.071</td>
<td>-1.82</td>
<td>.0761</td>
</tr>
<tr>
<td>FEMALE</td>
<td>-.164</td>
<td>.815</td>
<td>7.811</td>
<td>.018</td>
<td>.000</td>
<td>.10</td>
<td>.9175</td>
</tr>
<tr>
<td>SIB PAIR</td>
<td>-.207</td>
<td>-6.746</td>
<td>5.549</td>
<td>-.208</td>
<td>.031</td>
<td>-1.22</td>
<td>.2333</td>
</tr>
<tr>
<td>VERB IQ</td>
<td>.431</td>
<td>.714</td>
<td>.233</td>
<td>.538</td>
<td>.199</td>
<td>3.06</td>
<td>.0046*</td>
</tr>
</tbody>
</table>

* \( p < .05 \)

Multiple R \( .58625 \)
R Square \( .33948 \)

The multiple correlation coefficient \( (R) \) between reading achievement and the combined factors of Verbal IQ, family background characteristics and HELPS was .59. The combination of these predictor variables accounted for 34% \( (R^2) \) of the total variance of reading achievement.

Considering the small sample size, the only predictor variable with a statistically significant effect on reading achievement scores was verbal IQ with a regression coefficient of .54, and accounted for 20% of the unique variance in achievement scores (holding everything else in the equation constant). The Helps variable had a positive, but not substantial effect on achievement scores, and explained only 1% of the unique variance with a regression coefficient of .11.
Birth rank, sex, and unemployed mothers showed very low (weak) beta weights, .08, .02 and .02. The combined effect of these predictors accounted for less than 1% of the unique variance in the percentile scores.

Family SEI scores did have a substantial negative effect on reading achievement scores, and was close to significance level. The regression coefficient of family SEI was -.29, explaining 7% of the unique variance of achievement. Sibling pairs were also negatively associated with reading percentile scores, and accounted for 3% of the variance with a regression coefficient of -.21.

Table 16. MULTIPLE REGRESSION WITH MATH ACHIEVEMENT SCORES REGRESSED ON IQ SCORES, FAMILY CHARACTERISTICS AND HELPS

<table>
<thead>
<tr>
<th>Variable</th>
<th>( r )</th>
<th>( b )</th>
<th>Std. Er.</th>
<th>Beta</th>
<th>( r )</th>
<th>T</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>HELPS</td>
<td>.435</td>
<td>1.242</td>
<td>.555</td>
<td>.403</td>
<td>.126</td>
<td>2.24</td>
<td>.0331*</td>
</tr>
<tr>
<td>FEMALE</td>
<td>.069</td>
<td>-1.582</td>
<td>7.362</td>
<td>-.038</td>
<td>.001</td>
<td>-.22</td>
<td>.8314</td>
</tr>
<tr>
<td>PERF IQ</td>
<td>.155</td>
<td>.297</td>
<td>.270</td>
<td>.205</td>
<td>.031</td>
<td>1.10</td>
<td>.2809</td>
</tr>
<tr>
<td>MO UNEMP</td>
<td>.058</td>
<td>1.063</td>
<td>7.502</td>
<td>.024</td>
<td>.001</td>
<td>.14</td>
<td>.8882</td>
</tr>
<tr>
<td>B-RANK</td>
<td>-.032</td>
<td>-.837</td>
<td>2.786</td>
<td>-.051</td>
<td>.003</td>
<td>-.30</td>
<td>.7660</td>
</tr>
<tr>
<td>T-AGE</td>
<td>.130</td>
<td>1.799</td>
<td>1.893</td>
<td>.162</td>
<td>.023</td>
<td>.95</td>
<td>.3497</td>
</tr>
<tr>
<td>FAM SEI</td>
<td>-.012</td>
<td>-.247</td>
<td>.429</td>
<td>-.105</td>
<td>-.008</td>
<td>-.58</td>
<td>.5694</td>
</tr>
<tr>
<td>SIB PAIR</td>
<td>-.267</td>
<td>3.672</td>
<td>5.535</td>
<td>-.121</td>
<td>-.012</td>
<td>-.66</td>
<td>.5123</td>
</tr>
</tbody>
</table>

* \( p < .05 \)

Multiple R \( .51724 \)
R Square \( .26754 \)
The multiple correlation (R) between math achievement and the combined factors of Performance IQ, family background characteristics, and HELPS was .52, with 27% of the total variance accounted for by the combination of these predictor variables.

As indicated by the semi-partial square correlation, the HELPS explained the largest amount of unique variance (13%) of math achievement scores (again holding constant the other variables), and was the only predictor variable to have a statistically significant effect. WISC-R Performance IQ was positively associated with math percentile levels, and accounted for 3% of the variance with a regression coefficient of .21. These two factors combined explained 16% of the total variance, although HELPS accounted for 4 times as much unique variance as did Performance IQ.

Other variables with a positive effect, but not substantial were test age which explained only 3% of the unique variance, and unemployed mothers which explained less than 1% of variance.

Family SEI and Sibling Pairs showed a negative effect on math achievement scores, with regression coefficients of -.10 and -.12, and together explained 3% of the unique variance. Birth rank, and the child's sex showed weak, negative effects and accounted for less than 1% of the combined variance.
Concerning the analyses, several points need to be emphasized. Importantly, the small sample size was a factor which limited the precision and resulted in larger standard errors. Secondly, the sample does not represent 43 independent observations because many subjects were in the same household. This is known as household "clustering", and clustering usually produces computed standard errors for regression coefficients that are smaller than they would be if the observations were all independent. As a result, the standard errors are probably smaller than they should be and the t-values are larger than they should be.
CHAPTER FIVE

DISCUSSION OF THE RESULTS

In this chapter an overview of the study is presented, followed by a discussion of the research findings. The theoretical and research implications are also discussed.

An Overview of the Study

For the past several decades the number of Korean children adopted by white American families has increased substantially. Korean children and adolescents constitute the largest single group of transracially adopted children in the United States (Feigelman & Silverman, 1983).

Despite the growing numbers of adopted Korean children, research is limited concerning the development and adjustment of these children. The few studies available do report that the adjustment of Korean children is more favorable in comparison to other biracial and Caucasian adoptees, based on factors of physical, social and cognitive development (Feigelman & Silverman, 1983; Gill & Jackson, 1983; Kim, 1977; Winick et al., 1975). However, there are no reported studies which systematically examine the academic achievement of Korean children adopted by American families.
Evaluating the academic achievement of adopted Korean children also provides more information on how family background affects the intellectual development of children. Families influence the intellectual development of their children both genetically and environmentally. However, in most family studies the members are biologically related, and untangling the effects of shared genes and shared environment remains a formidable task (Willerman, 1979). Studies of adoptive families are important because they offer one of the few methods available for separating the effects of heredity and environment relative to the development of children.

Therefore, the purpose of this study is to provide a base of empirical and descriptive information concerning this particular group of children. Specifically, the goals of this study are:

- to assess the academic achievement of Korean children who have been adopted and reared by white American families; and,
- to contribute to information regarding the relative influence of the following factors on academic achievement in children:
  - family background attributes
  - home educational environment
  - intellectual ability.
A Description of the Sample Group of Children

The children of this research sample were forty-three Korean children who were adopted by white American families. There were seven males and thirty-six females who were between eight and twelve years of age at the time of testing. As explained in Chapter Two, the vast majority of Korean children available for international adoption are female.

Twelve of these families (more than half of the sample) had adopted two Korean children. Two children in one of these twelve families were biological half-siblings; no children in the other eleven families were biologically related. On average, these families consisted of 4.3 individuals, with 2.4 children.

All of the Korean children spent a period of time in foster homes or orphanages prior to placement, as is required by immigration standards for overseas adoptions. Seventy-four percent of them were placed in their adoptive homes by nine months of age. However, no additional information was available about each child's biological parents or preadoptive experience.

The Socioeconomic Background of the Adoptive Parents

Most parents in this sample were assessed to be socioeconomically average (middle class) but also
represented a wide range of status and income level differences. In addition, they were above average in education. Specifically:

- they scored a mean of 72 on the Duncan Socioeconomic Index (SEI) which characterizes them as middle class;
- the average education level was 16.2 years for fathers and 15.8 years for mothers.

The demographic characteristics of these adoptive parents compare similarly to those of previous adoption studies. The studies of Moore (1986) and Scarr & Weinberg (1976) both featured black children who had been adopted into white families. Moore (1986) reported a Duncan SEI score of 70.3 for the adoptive parents and an average of 17.3 years of education for adoptive fathers. Scarr & Weinberg (1976), using the NSRC occupational prestige scores, characterized the parents as above middle class, and reported an average educational level of 16.9 for fathers and 15.1 for mothers.

Two additional adoption studies have rated adopting parents as middle class using the Duncan Socioeconomic Index to measure socioeconomic status. Norn et al., (1979) report a mean SEI of 65 for adoptive fathers in the Texas Adoption Project. Plozin & DeFries (1985) report a mean SEI of 63 for the adoptive fathers in the Colorado Adoption Project.
The Measurements

The academic achievement of this group of adopted Korean children was measured by the California Achievement Test Reading and Math subtests.

The socioeconomic background and attributes of the adoptive parents were measured using the Duncan socioeconomic Index.

Home educational environments were measured using the Henderson Home Environmental Learning Scale.

Each child's intellectual aptitude was measured using the Wechsler Intelligence Scale for Children - Revised.

Overview of the Results

Academic Achievement

The adopted Korean children in this study scored higher than average on standardized tests of reading and math. The California Achievement Test scores revealed that more than half of the children scored:

- on the 90th percentile or better on the Reading subtest;
- on the 86th percentile or better on the Math subtest.

The children in four other adoption studies that measured the scholastic achievement of adopted children also had above average achievement scores (Freeman, et al., 1985;
Fisch et al., 1976; Scarr & Weinberg, 1976; Schiff et al., 1978). In general, however, there is scarce data on this topic (Schiff et al., 1982) as IQ measurement has been more the focus of adoption studies. Thus, precise comparisons would be questionable due to the use of different tests and doubts about their comparability (Golberger, 1976).

The Influence of the Home Educational Environment

The Henderson Home Education Process Scale (HELPs) measured the specific details of the home educational environment, such as parental attention and support for learning or parental expectations toward achievement. Results from regression analysis showed that the HELPs was the only predictor variable to have a statistically significant effect on math achievement (Beta = .404), and accounted for 13% of the unique variance.

Factors such as these and others regarding the relative educational support that a child receives from the parents in the home have been shown to be stronger predictors of academic achievement than global measures of the home environment such as family social status (Bradley, et al., 1989; Henderson, 1981, 1966; Kitonyi, 1980; Loasa, 1982; Marjoribanks, 1987; White, 1982).
The Influence of Familial Socioeconomic Factors

Children from families with comparatively less status and income scored as well as or better than children from upper-middle class families. In fact, results from regression analysis revealed that socioeconomic status, as rated by the Duncan SEI score, had a substantial negative effect on reading achievement levels (regression coefficient = -.287). That is, as socioeconomic status increased, the academic performance of children decreased.

Earlier adoption studies by Burks (1938) and Scarr & Weinberg (1975) also report that within the adoptive family, high status and income do not predict high scholastic performance by the adopted children. Further, other family background attributes, such as birth rank, sibling spacing and parental occupation also are reported to have negligible ability to predict scholastic achievement by adopted children in studies by Bloom (1964), Dave (1963), Henderson (1981), Henderson et al. (1972), Marjoribanks (1978 and 1987), White (1982) and Woelfel & Haller (1971).

Paternal education did correlate with math achievement scores (r = .438, p = .003). The important influence of fathers on the academic performance of children also occurs in studies by Blanchard & Biller (1971), Lamb & Frodi (1979), Lamb (1979) and Lynn (1974)...
The correlations between birth order and academic performance were negligible. Correlations between birth order and academic (and IQ) test performance have yielded contradictory results in studies carried out by Berndt & Bulleit (1985), Kidwell (1982), Schooller (1972) and Wagner et al. (1979).

Children with an adopted Korean sibling in the family had consistently lower reading and math achievement scores than children without an adopted Korean sibling.

The Influence of Intellectual Ability

These adopted Korean children scored above the national norms for the general population on the Wechsler Intelligence Scale for Children - Revised (WISC-R).

The Verbal IQ average score was 120; the Performance IQ average score was 118; the Full Scale average IQ score was 122. These scores place these children in the superior range of intellectual abilities, except for the Performance IQ which falls in the high average (bright) range.

As expected, intellectual ability (IQ) consistently correlated with academic achievement. The WISC-R Verbal IQ scores correlated significantly with both reading achievement ($r = .2940$) and math performance ($r = .287$). The Full Scale IQ score was also correlated significantly with math achievement ($r = .245$). The WISC-R Verbal IQ is
generally considered a better indicator of scholastic achievement than the WISC-R Performance IQ. Results from regression analysis showed that the only significant predictor of reading achievement was the WISC-R Verbal IQ, (Beta = .538) and explained 20% of the unique variance. These findings are consistent with numerous studies showing the significant relationship between academic performance and intellectual ability (Jenks, 1972; Vernon, 1979).

These present findings on the IQ levels are also generally consistent with previous adoption study results showing the above average intellectual ability of adopted children (Dumaret, 1985; Horn et al., 1979; Moore, 1986; Scarr & Weinberg, 1976; Schiff et al., 1982).

More recently, Frydman & Lynn (1989) tested the intellectual ability of ten year old Korean children adopted (at an early age) by Belgian families.

The French version and standardization of the WISC were used. All the subtests in the Performance Scale of the French WISC are identical to the American WISC. The verbal subtests are similar in format to the American WISC Verbal subtests, but reworded and adapted for use in the French culture.

The adoptive Belgium families were characterized as middle class and average in education. The children were, on average, ten years old at the time of testing. For this
group of adopted Korean children the Verbal IQ average score was 110.6; the Performance IQ average score was 123.5; and Full Scale average IQ score was 118.7. The WISC-R has higher norms than the WISC. Had the WISC norms been used for this present study of Korean children adopted by American parents, the average IQ scores would have been somewhat lower, and thus, quite similar to those reported by Frydman & Lynn (1989).

The Wechsler IQ test results from other (American) adoption studies show a range of 109 to 117 for the Full Scale score. These studies include children who were adopted prior to age two and have used the WISC to measure intellectual performance, with the exception of the early adoption study by Leahy (1935).

Moore (1986) tested twenty-three children who were black or biracial (one black and one white biological parent) and who were adopted at an early age by middle class white families. This group of children had an average age of 8.61 years at the time of testing. For this group of black and biracial children adopted by white parents the Full Scale average IQ score was 117.1. This score compares well with that of the group of Korean children adopted by white American parents; i.e., once again had WISC norms been used for this group their average IQ scores would have been somewhat lower.
Scarr & Weinberg (1976) performed a large study that included ninety-nine black and biracial children and nine white children; both groups were adopted early by white parents. The Full Scale average IQ score was 110.4 for the black and biracial children and 116.8 for the white children.

Leahy (1935) reported a Full Scale average IQ score of 112.6 for white children adopted early by professional families.

Interestingly, one finding challenges previous reports that, based on national test results, Asian-Americans are weaker in verbal ability than in mathematical aptitude. The scores of these adopted Korean children demonstrate equally strong verbal and perceptual, visio-spatial ability and support the explanations of others, that the cultural and language differences experienced by Asian-American students are the primary factors accounting for lower verbal test scores.

Limitations and Other Influential Factors

It is worth considering that the scholastic achievement and IQ scores of these Korean children were enhanced by other unmeasured factors present in adoptive families, e.g., special attention and interest paid by the adoptive parents to the "chosen" child.
Following are seven additional factors which possibly could have impacted and influenced this study's results, and thus limit their generalizability.

For one, the small sample size and the effect of household clustering limit the precision of the statistical analyses.

Also, the study participants resided in a small geographic area, and thus are not necessarily reflective of the population as a whole.

Another factor involves the question of how Korean infants are selected for overseas adoption. This process is not well documented or clearly understood. Perhaps brighter, more developmentally advanced infants or those who have received the best preadoptive care are selected for foreign adoptions. On the other hand, a study by Whang (1976) on the relinquishment of Korean children for inter-country adoption indicates that Korean children are exposed to a certain amount of deprivation prior to adoption. The Korean selection process and the preadoptive experience of Korean infants are topics worthy of further examination.

It is also possible that the unknown effects of racism may have contributed to the achievement of these adopted Korean children. Perhaps the racial differences between these children and their families and peers motivated the children to work hard and perform well in school.
Another speculation is that the adoptive parents' beliefs about the childrens' racial background enhanced their intellectual development. If parents expected their Korean child to score above average, this expectation might have contributed to the performance levels of the children.

Similarly, high teacher expectations may have contributed to the academic performance of the Korean children. As reported in Chapter Two, several studies demonstrated that teacher expectations were higher for Asian students than for white students (Tom et al., 1984; Wong, 1980).

Lastly, this sample consisted of volunteers. Thus, a pertinent question is whether subjects who volunteer to participate differ from those who do not. Hence, findings will have limited generalizability as they will not be representative of all adopted Korean children.

**Implications of the Results**

The results of this study indicate that a supportive home educational environment and intellectual ability are strong predictors of academic achievement in children. Family background attributes such as birth rank, sibling spacing, income, and parental occupational status are not as strong a predictive factor of children's academic achievement as previously thought, especially in comparison
to home educational environment factors such as parental involvement with learning.

As stated earlier, the high correlation between intellectual ability and academic achievement was expected and the finding is consistent with numerous studies that repeatedly verify this relationship (Jenks, 1972; Vernon, 1979). It could be argued that genetic influences contributed significantly to the intellectual performance of these Korean children. This argument can not be adequately substantiated by this study. However, Plomin & DeFries (1980) reviewed extensive data on genetic effects on intelligence and concluded that although the more recent findings suggest somewhat less genetic influence on IQ than did early adoption studies, "all the data converge on the conclusion of significant and substantial genetic influence." (Plomin & DeFries, 1985, p. 90.)

Evidence from the behavioral-genetic research shows that approximately fifty percent of the variance in measured intelligence is based on genetic influence. However, even if one accepts this evidence regarding the genetic effect on intelligence, this still leaves a substantial influence of environmental effects on intellectual development. In fact, Plomin & DeFries (1985, 1980) further explain that the behavioral genetic studies provide the best evidence that environmental influences are important for IQ.
There has been much controversial literature debating the issue of race and intelligence.

Several studies have investigated the question of whether genetic or cultural differences account for observed differences between the academic performance and IQ levels of black and white racial groups (Nichols, 1976; Scarr, Pakstis, Katz & Barker, 1977; Scarr & Weinberg, 1976). Scarr (1979) reviews the results of these studies and concludes that "the major source of difference in intellectual performance between blacks and whites is not genetic." The lower performance of black children is explained by cultural and environmental differences. The knowledge and skills sampled in standardized tests reflect those of the dominant white culture and frequently are not imparted to black children.

Other researchers, however, although not excluding the profound importance of motivation, effort and social expectation so dominant in Asian culture, have asserted that genetic differences in cognitive functioning between races does account for the high intellectual and academic achievement levels of Asians (Fox, 1991; Frydman & Lynn, 1987; Kendler, 1981; Lynn, 1987; Segalowitz, 1983; Springer & Deutsch, 1991; Springer & Searleman, 1978).

Some researchers have articulated the reasons for resisting the idea that there are genetic intellectual
differences among races due to the evolutionary pressures exerted on different populations. Kendler (1991), in Unanswered Questions About Racism and Scientific Purpose, asks "are racial differences and racial superiority equivalent terms, or is one factual and the other a value judgement?" Plomin & DeFries (1989) point out that the notion of genetic differences in cognitive development appears to conflict with the ideal that all human beings are equal. They further explain that, although this concept does not imply that all people are identical, "the essence of democracy is to treat men equally in spite of their differences". (Plomin & DeFries, 1989).

Other genetic researchers offer their views on why we need to explore the issue of genetic influence on development. For one, an understanding of genetic influence likely will illuminate the relative impact of environmental influence. Scarr offers the following reasons for valuing genetic studies.

- These studies can and do provide diagnostic clues about the nature of some development problems, i.e., hyperactivity, irritability, or shyness. We can have more respect for individual differences in development.
- It is important to sort out which variations in the environment make a difference and which
ones do not. It is important for us to know what aspects of the environment have actual consequences to gain a clear understanding of the relevant influences on children's development.

Such arguments on behalf of the usefulness of genetic studies relate to this study's purpose. The most fundamental assumption of an adoption study is that genetic and familial environmental factors are independent of each other in adoptive families. The design of an adoption study permits one to examine the relationship between environmental measures (e.g., parental or home characteristics) and children's development (e.g., school performance) which is free from the possible confounding effects of genetic influences that are always present in nonadoptive families.

It is hoped that this study will provide baseline information for future studies examining the achievement and development of adopted Korean children, and that the issues presented also will be relevant to educators, researchers and others interested in the development of children in general. Children will benefit if parents recognize and respect the genetic uniqueness of all children who grow up in their home. Adoptive parents especially will benefit from recognizing that to some extent, heredity influences
Development and may use this awareness to help provide the best possible environment for their adopted child.

**Suggestions for Future Research**

Studies to provide further information regarding the generalizability of this study are suggested. Specifically, these studies could include research with groups of Korean children who:

- are of similar and different ages at time of testing;
- share various and related family background characteristics;
- live in different geographic areas;
- are adopted and reared by Asian parents.

Replications of this study with larger sample sizes would be especially helpful in determining how well this study's results reflect the achievement and experience of all adopted Korean children.

Benefits from longitudinal studies would be twofold. For one, they could reveal more about the long term adjustments of adopted Korean children and determine whether initial achievement levels persist through adolescence.

Secondly, they could consider the dynamic nature of the relationship between environment and development (Nache & Gruen, 1982) a view which holds that different aspects of the
environment decrease or increase in salience at different ages and for different behaviors.

It is well known that certain environmental differences such as the educational level of the parents or the amount of parental involvement in the child's schoolwork generally have a greater effect on verbal than on non-verbal test scores (Dumaret, 1985). Cognitive skills such as vocabulary and general knowledge are more environmentally influenced than are abstract reasoning ability and perceptual organization.

Further studies using factor analysis of the Wechsler IQ results, additional factor variables such as motivation, social environment, attitudes toward school, teacher expectations, different measurements and different age groups could provide additional information regarding individual differences in children's intellectual development.