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Family Background, Early Development, and Intelligence of Children 6-11 Years

United States

The relationships of estimated intelligence of these children to factors in their background, prenatal care, condition of the child at birth, early developmental history, preschool educational experience, and present medical problems are analyzed.

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FAMILY BACKGROUND, EARLY DEVELOPMENT, AND INTELLIGENCE OF CHILDREN 6-11 YEARS

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INTRODUCTION

This report contains national estimates of the prevalence of selected congenital and early developmental health problems and describes the relationship of selected aspects of family background, infant health status, and early developmental history to the intellectual development and maturity of noninstitutionalized children 6-11 years of age in the United States, based on findings from the Health Examination Survey of 1963-1965.

The Health Examination Survey is a major program of the National Center for Health Statistics which was established to carry out the Health Survey Act of 1956, enacted by the 84th Congress to provide for a continuing assessment of the health status of the U.S. population.

Three different programs are utilized in the National Health Survey.[1] The Health Interview Survey collects health information from samples of people by household interview. The Health Resources programs obtain health data as well as health resource and utilization information through surveys of hospitals, nursing homes and other resident institutions, and the entire range of personnel in the health occupations. The Health Examination Survey, from which the national estimates in this report were obtained, collects health data by direct physical examination, tests, and measurements performed on samples of the population.

The Health Examination Survey has been conducted as a series of separate programs, or cycles, which were limited to some specific segment of the noninstitutionalized population and to specific aspects of health. In the first cycle, data were obtained on the prevalence of certain chronic diseases and the distribution of various physical and physiological measures or characteristics in a defined adult population.[2,3]

In the second cycle, on which this report is based, a probability sample of the Nation's noninstitutionalized children 6-11 years of age was selected and examined. The examination, which focused primarily on health factors related to growth and development, included an examination by a pediatrician, an examination by a dentist, tests administered by a psychologist, and a variety of tests and measurements by technicians. Prior to the examination, demographic and socioeconomic data on household members as well as medical history, behavioral, and related data on the child to be examined were obtained from one of the parents, usually the mother. Ancillary data for the child on grade placement, teacher's ratings of his behavior and adjustment, and health problems known to the teacher were requested from the school. Birth certificates for verification of the age and information related to the child at birth were also obtained. The survey plan, sample design, examination content, and operation of this program have been described in detail previously.[4]

Field collection operations for this cycle started in July 1963 and were completed in December 1965. There were 7,119 children, or 96 percent, examined out of the total probability sample of 7,417 children selected. This national sample is representative, and the group of examinees is also closely representative of the nearly 24 million noninstitutionalized children 6-11 years of age in the United States at the time of the survey.

Statistical notes on the survey design, reliability of the data, and sampling and measurement error are shown in appendix I. Demographic and socioeconomic terms are defined in appendix II.

SOURCES AND LIMITATIONS OF DATA

Background information on the families of these children that included family size, position of mother in the household, and educational level of the parents was obtained in a standardized interview by the U.S. Bureau of the Census personnel during the selection of the sample to be examined.

Medical history information—regarding prenatal care, complications during pregnancy, place of birth of child, length of hospitalization after birth, birthweight, twin status, handedness, early developmental history, infant health status, health history of neurological conditions, and preschool educational experience—was obtained from a self-administered questionnaire left in the home of the sample child by the Census interviewer. The forms were completed by the parent, usually the mother, and picked up about 2 weeks later by the Health Examination Survey (HES) field representative. During her visit to the home, the HES field representative reviewed the history and answered questions that the parent may have had concerning that form.

Information available from the birth certificate for more than 94 percent of the examined children included birth order of the child, birthplace of the mother, other children of this mother now dead or stillborn, age of mother and father at the time of this birth, pregnancy complications, place of birth, birthweight, and twin status, and that for about 60 percent of the examined children included information on congenital malformation and birth injury.

Questions used from the household interview, medical history, and birth certificate are shown in appendix III.

Data on congenital heart disease and neurological and musculoskeletal conditions present and detected at the time of the survey were obtained from the diagnostic impressions of the survey pediatrician based on the findings of his examination and on evaluation of the medical history, as described previously.[5]

Estimates of the intellectual development levels of these children were based on the findings from the Vocabulary and Block Design subtests of the Wechsler Intelligence Scale for Children (WISC), which had been administered during the psychological part of the examination by the survey psychologists in a uniform manner, as previously described.[6] The Vocabulary and Block Design subtests of the WISC were selected from the Verbal and Performance test groups, respectively, since previous studies indicated that they were at least as good as any 2 of the 12 subtests of the WISC in estimating Full Scale intelligence from that test.[6]

A more thorough evaluation of the adequacy of these two subtests of the WISC in the estimation of Full Scale Intelligence Quotient (IQ) of children 6-11 years of age was made by Dr. Jane Mercer of the University of California and the California State Department of Mental Hygiene under contract with the National Center for Health Statistics. Findings from this study among 1,310 children attending public elementary schools in Riverside, California, in 1967-1968 showed that the dyad of subtests used in the national survey produced predictions of Full Scale IQ that were better or at least as good as any other dyad of the WISC across all three ethnic groups in the Riverside sample. The correlation of Full Scale with the Vocabulary-Block Design dyad determined either as a multiple correlation from the two subtests or as a simple correlation with the sum of the (scaled) scores from the two subtests was +0.88.[7]

For convenience in this report, raw scores on the Vocabulary and Block Design subtests for children at each single year of age have been converted to standard scores by setting the mean obtained in this study at 100 and the standard deviation at 15. The estimates for the Full Scale deviation IQ from both subtests combined in this report were derived by adding the standard scores on the two subtests and again making a scale transformation setting the mean at 100 and standard deviation at 15. Except for the standardization within 1-year rather than 4-month age intervals and the use of standard scores rather than scaled scores, the methods used here are identical to those described in the two previous publications on WISC findings among children.[6,8] This was done so that the standard score values would be in units more nearly comparable to those from the modified Goodenough-Harris Drawing Test.

Intellectual maturity level estimates for these children were based on findings from the modified Goodenough-Harris Drawing Test. As in the previously published findings from this test in the national survey among children, raw scores on the Man and Woman Scales have been converted to standard scores with a scale transformation to a mean of 100 and standard deviation of 15.[9,10]

These standard score or deviation IQ values make possible the comparison of children of one age with others of different ages, since these are measures which theoretically remain invariant with age on retest for a particular child unless his actual test performance as compared with his peers changes.

FINDINGS

Family Background

Previous reports from this national study have considered the relationship of education of the first parent (for 84 percent, this was the father of the child) and of family income to the level of intellectual development and intellectual maturity of U.S. children 6-11 years of age.[8,10] A strong positive association was found with each socioeconomic factor. The degree of association was substantially greater for intellectual development as measured by the short form of the WISC than for intellectual maturity as measured by the modified Goodenough-Harris Drawing Test (HFD). On both tests the association was slightly greater with parent education than with family income. For the WISC the correlation or degree of association (r) with education was +.48 and with income +.43. For the HFD test the correlation with education was +.24 and with income +.20. The associations were stronger on the Vocabulary than on the Block Design subtests of the WISC. When the effect of income is held constant, the degree of association between parent education and intelligence of these children is only slightly reduced because of the strong relationship existing between education and income ($r = +.58$).

In this report the relation of additional aspects of family background to intelligence will be considered, including educational level of both parents, whether both parents are living in the household, whether the mother was foreign born, ages of both parents at the time these children were born, other children in the family not now living, family size, and age order of the child in the family.

Parent education.—The strong positive relationship between education of the first parent in the household and intelligence of the child is clearly evident on each aspect of intelligence as measured in this study. The mean standard score or deviation IQ on the WISC increased consistently from 86 among those whose first parent had less than 5 years of formal schooling to 108 among those whose parent had some college education (table 1). The association was stronger on the estimate of verbal intelligence as obtained on the Vocabulary subtest of the WISC, where mean standard scores increased from 84 among children whose first parent had less than 5 years' schooling to 110 among those whose parent had some college education, than on the estimate of intellectual performance from the Block Design subtest of the WISC, where the mean standard scores increased with parent's educational level from 90 to 107.

On the measure of intellectual maturity from the modified Goodenough-Harris Drawing Test, the consistent association of parent's education with intelligence of the child, although of a lower order of magnitude, is clearly evident, with the mean deviation IQ increasing from 90 among those whose first parent had the least education to nearly 105 among those whose parent had some college education. The pattern is similar whether the child drew the figure of a man or a woman on this test.

The pattern of association between education of the second parent (for 86 percent of the children, the mother) and intelligence of the child is essentially identical to that found with respect to the education of the child's first parent. The mean deviation IQ of these children increased consistently on the WISC from 86 to 108 and on the HFD from 90 to 104, as the education of the second parent increased from less than 5 years to 13 years or more (table 1).

The educational levels of the first and second parent of the child tend to be similar ($r = +.90$). Within the four broad educational groups considered here, for 60 percent both parents were within the same group, for 18 percent the first parent was one level advanced, for 17 percent the second parent was one level advanced, while for only 5 percent was there more than one level difference between the two parents.

When the educational level of the first parent is held constant and that of the second parent allowed to vary, the positive pattern of association of the latter with the standard scores of the child may be seen to persist consistently on the Vocabulary subtests within each educational group for the first parent, on the Block Design for those whose first parent had 5 years or more of schooling, and on the HFD when limited to first parent with 5-12 years of formal schooling (table 2 and figure 1).

The pattern of association between the father's and mother's education and the intelligence of their children is essentially identical to that indicated above for the first and second parent of these children.

Relation to first parent.—For the majority of these children (84 percent) the first-listed parent in the household was the father, while for nearly 10 percent the mother was the only parent. Less than 1 percent were living with unrelated foster parents or guardians. Children whose father or stepfather was in the household or whose mother was the only parent generally obtained higher mean scores than those living with grandparents, other relatives, or foster parents, as may be seen in table A for findings from the HFD test. The pattern is somewhat more consistent for those drawing the Man than the Woman figure, though the difference between the mean scores on the two scales is negligible.

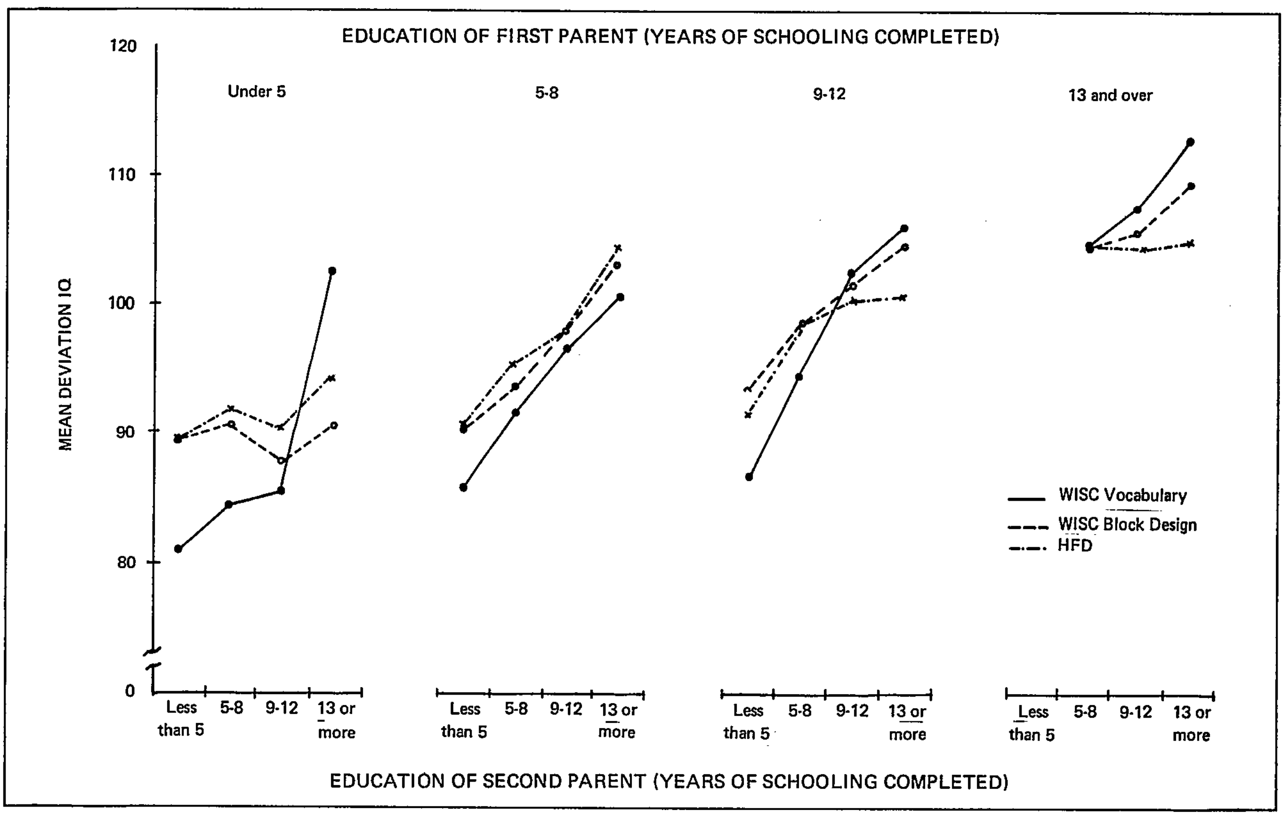

Figure 1. Mean deviation IQ on the WISC Vocabulary and Block Design and the HFD tests for children 6-11 years, by educational attainment of first and second parent: United States, 1963-1965.

Table A. Number of children, percent of children, mean standard scores, and standard error of scores on the Goodenough-Harris Drawing Test for children 6-11 years, by relation of first parent to child: United States, 1963-1965

Relation of first parent to child	Number of children in thousands	Percent of children	Goodenough-Harris Drawing Test			
			Mean standard scores		Standard error	
			Man Scale	Woman Scale	Man Scale	Woman Scale
Father	20,083	84.4	101.0	101.0	0.64	0.48
Mother	2,327	9.8	97.8	98.6	1.06	0.88
Stepfather	723	3.1	100.2	96.6	1.61	1.77
Stepmother	4	0.0	[1]99.4	-	[1]70.27	-
Grandfather	187	0.8	94.8	97.5	2.46	4.42
Grandmother	124	0.5	92.1	92.4	5.66	3.70
Other relative	125	0.5	90.5	92.3	3.45	3.50
Unrelated guardian	16	0.1	[1]93.0	[1]113.1	[1]65.77	[1]56.98
Foster parent	195	0.8	96.6	95.2	2.11	3.93

[1] Unreliable estimates, included only for completeness.

Birthplace of mother.—Children 6-11 years of age whose mothers were born in a foreign country obtained significantly lower mean standard scores on the Vocabulary subtest of the WISC than those whose mothers were born in this country (87 compared with 100); while on the Block Design subtest and the HFD test, the mean differences were small enough to be due to sampling variability alone (table 3 and figure 2). These findings are similar among boys and girls but are less consistent by age because of the small number of children with foreign-born mothers (3.4 percent). The poorer performance for those with foreign-born mothers on the Vocabulary subtest is most evident among the youngest children at ages 6 and 7; while on the Block Design subtest, this is apparent only among those at age 6. Among older children, on the WISC and the HFD tests, the mean differences were small enough to be due to sampling variability alone.

Age of parents.—Mean deviation IQ's of children 6-11 years of age in the United States increased consistently with their mother's age at the time they were born, reaching their maximum values for those whose mothers had been 25-39 years. On the measure of intellectual development (WISC), the increase was from a mean standard score of 95 to 101; while on the measure of intellectual maturity (HFD), mean deviation IQ increased only 3 points from 98 to slightly over 100 (table 4 and figure 3). Only on the WISC were successive mean differences between maternal age groups 10-19 years and 20-24 years large enough to be statistically significant at the 5-percent probability level.

Only negligible variations in mean deviation IQ of children over the maternal age span 25-39 years were evident; while among children whose mothers had been 45 years or over, mean deviation IQ's on both measures declined to their lowest point, 90 on the WISC and 91 on the HFD. Because of the small number of mothers in these older age groups, the mean differences in deviation IQ of their children were small enough to be due to sampling variability alone, i.e., not statistically significant at the 5-percent probability level. The decline was slightly sharper on the Vocabulary than on the Block Design subtest of the WISC and on the Woman than on the Man Scale of the HFD.

The pattern of increase in mean deviation IQ of children with paternal age at childbirth is generally similar to that with maternal age on both measures of intelligence. However, on the WISC the mean values varied between 100 and 101 over the paternal age span of 25-44 years. On both tests the decline in the older (paternal) age groups was slightly less than that found with maternal age and the differences between the findings on the two subtests and two scales were less marked.

Family size.—The intelligence of children 6-11 years of age in this country, both on the

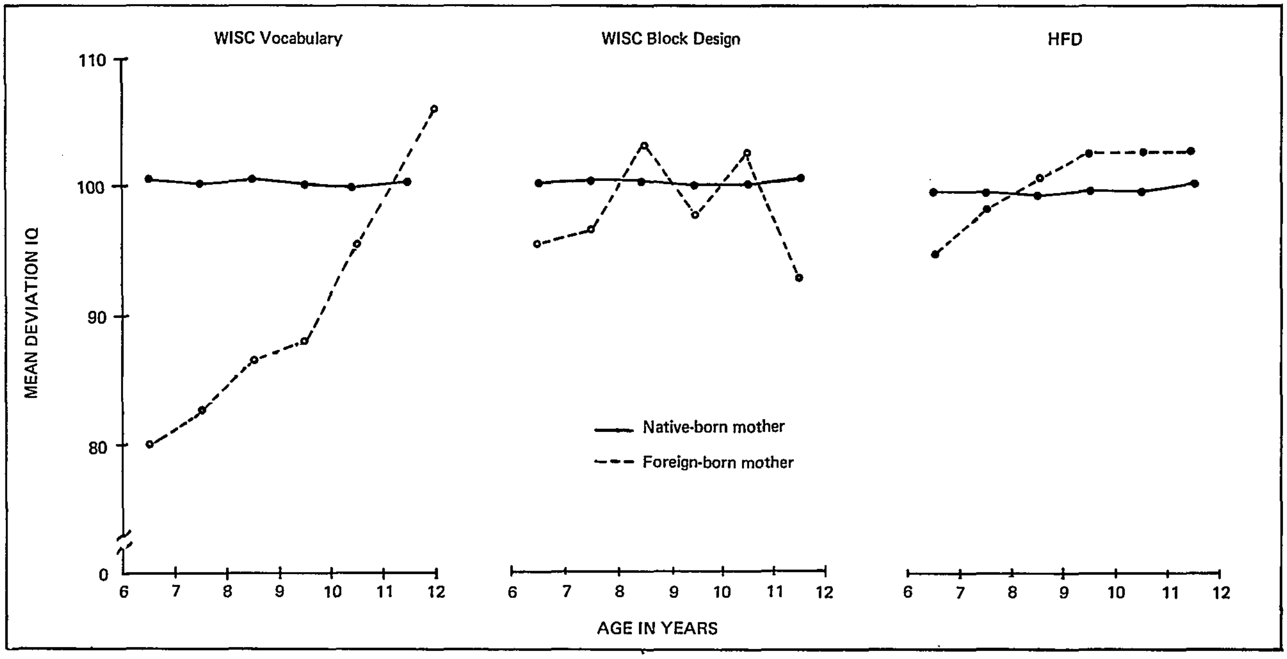

Figure 2. Mean deviation IQ on the WISC Vocabulary and Block Design and the HFD tests for children 6-11 years, by place of birth of mother and age of child at time of survey: United States, 1963-1965.

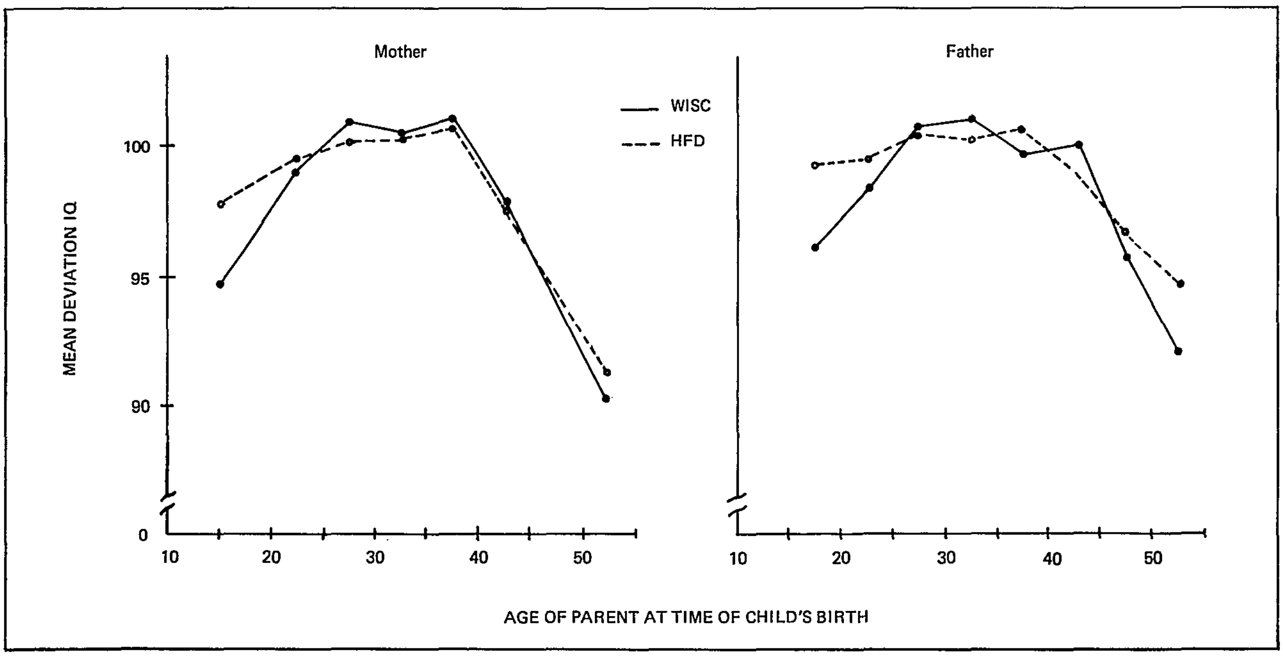

Figure 3. Mean deviation IQ on the short form of the Wechsler Intelligence Scale for Children (WISC) and on the modified Goodenough-Harris Human Figure Drawing (HFD) tests for children 6-11 years of age, by age of parents at time of child's birth: United States, 1963-1965.

measures of intellectual development (WISC) and intellectual maturity (HFD), was found to decrease consistently as the number of other children in the household increased. Mean deviation IQ's on the WISC decreased nearly 13 points, about 0.8 standard deviation, from 103 for children in families with one additional child to 90 for those in families with seven or more other children (table 5 and figure 4). On the HFD test the decline was less rapid: mean deviation IQ's dropped less than 8 points, the equivalent of 0.5 standard deviation, from the maximum on that test of nearly 102 for children in families with two other children to the minimum of 94 for those in families with seven or more other children. Mean differences in performance on the WISC were also large enough to be statistically significant between children in families with two-three and three-four other children and on the HFD between those in families with two-three others.

On the subtests, the decrease was greatest on the WISC Vocabulary subtest, a mean difference of 17 standard score points, and least on the other three, 8 points on the WISC Block Design and Man Scale (HFD) and 7 points on the Woman Scale (HFD).

Only children and those with one other child in the family obtained larger mean standard scores (4 points greater) on the Vocabulary than on the Block Design subtest of the WISC, while the reverse was found for those from larger families of four or more other children. Only for those in families with two or three other children were the mean standard score differences so small they could easily be due to sampling variability alone, i.e., not significant at the 5-percent probability level. The findings on the two scales of the HFD test with respect to the family size were less consistent than those on the WISC subtests, although children with one other sibling rated significantly higher on the Man than on the Woman Scale. Only children and those with three or five siblings obtained mean scores that were slightly greater on the Man than on the Woman Scale, while in other sized families, the reverse was found.

Children from families of no more than three other children obtained higher mean standard scores on the WISC than on the HFD tests, while the reverse was found among those from larger families. Mean differences were large enough to be statistically significant only for families of one, five, and six other children.

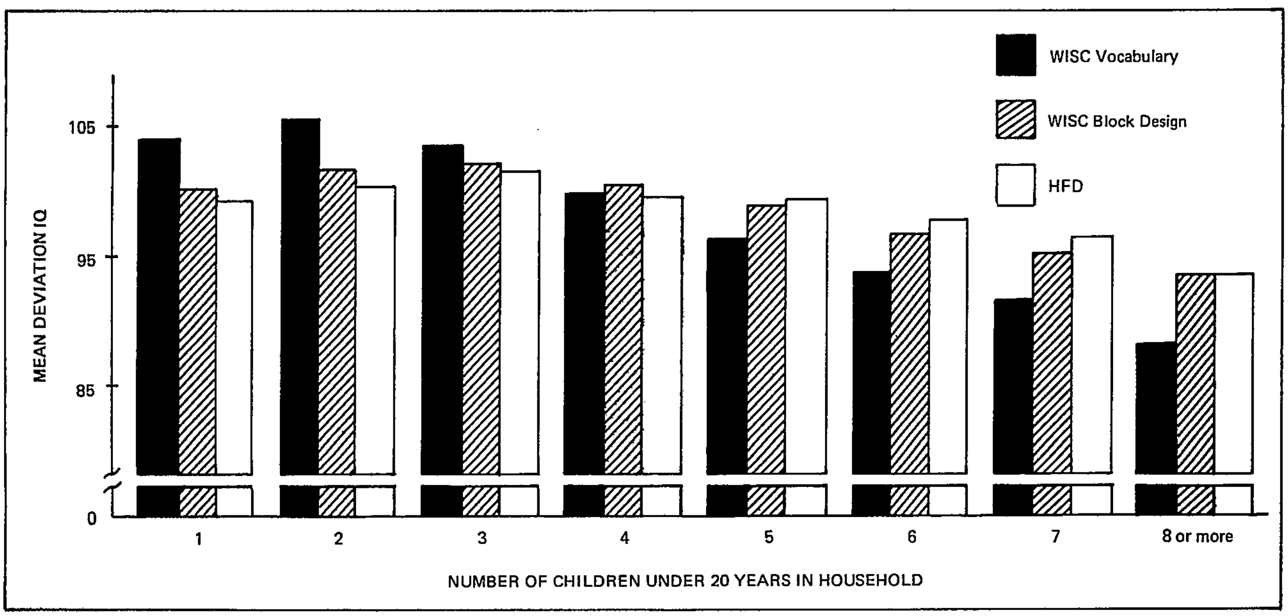

Figure 4. Mean deviation IQ on the WISC Vocabulary and Block Design and the modified HFD tests for children 6-11 years, by number of children under 20 in the household: United States, 1963-1965.

The negative relationship of intelligence and family size was stronger for boys than for girls as measured on the WISC, a mean decrease of 13 standard score points for boys (from a mean of 103 for those in families with two other children to 90 for those in families with seven or more other children) compared with 10 points for girls (from a mean of 101 for those in families with two other children to 91 for those in families with seven or more other children). The relationship and sex difference on the WISC Vocabulary subtest findings were substantially greater than those on the WISC Block Design.

The mean differences in deviation IQ with respect to family size for both boys and girls were lower and more nearly similar on the measure of intellectual maturity (HFD) than on that of intellectual development (WISC), 8 standard score points for boys and girls between those with two other children and those with seven or more other children in the family. The pattern of relationship on the WISC Block Design performance with family size was similar to that on the HFD test, decreasing mean scores with increasing family size of 10 points for both boys and girls.

The positive relationship of education of the first parent to the intelligence of the child is found consistently across all family size groups (table 6). Mean standard scores for children whose first parent had some college education exceeded those whose parent had less than 5 years' schooling on both subtests of the WISC and the HFD test, regardless of size of the family. The mean differences between those in the highest and lowest educational groups were greatest on the Vocabulary subtest for children from families with one or more other children and ranged from 21 to 25 standard score points. On the Vocabulary subtest for only children and on the Block Design for those with or without siblings, the magnitude of the mean differences were about the equivalent of one standard deviation, or 15-17 points. On the HFD test the differences ranged from 10 to 15 points.

When controlled by educational level of the first parent, a consistent pattern of inverse relationship of family size to performance on the Vocabulary subtest was found within each parent educational level. The mean difference in standard score points between those in the smallest and largest sized families was less for those in families where the first parent had some college education (9 points) than for those whose parent had 12 years of schooling or less (13-15 points). Differences on the Block Design subtest and the HFD test were substantially smaller and less consistent with family size, ranging from 2-6 standard score points across the four parent education groups.

Children who had one or more older siblings who had died or were stillborn, prior to the birth of the child in this study, rated lower on these measures of intelligence than did children from families where this had not occurred (table 7). However, no significant or consistent trend was found in relation to the number of such nonliving older siblings.

Age order.—A significant relationship was found between the age order (birth order) of the children and their performance on the intelligence tests in this study. The mean deviation IQ on both the measure of intellectual development and that of intellectual maturity decreased consistently with the decreasing age order of the children, from 101 and 100 among those who were oldest or only children in the family to 92 and 96, respectively, among those 6th or later in age order (table 8).

The relationship to age order was substantially stronger on the WISC than on the HFD test. On the test parts, the association with age order was also substantially stronger on the Vocabulary than the Block Design of the WISC and somewhat weaker on the Woman than on the Man Scale of the HFD test. The mean decreases on the Vocabulary, Block Design, Man, and Woman test parts between those who were first and those who were 6th or later were 12, 7, 5, and 2 standard score points, respectively. This pattern of relationship between deviation IQ of these children and their age order was generally similar among both boys and girls.

When controlled by family size (number of children under 20 years in household), the pattern of relationship of intelligence of children to their age order in the family is essentially eliminated. However, children from smaller families (three or fewer children) rated higher on these tests than did children from larger families, irrespective of age order. The findings on the two subtests of the WISC, where the pattern is strongest, are shown in table 9.

As would be expected, irrespective of the age order of the child, there was a consistent increase in mean deviation IQ with increase in educational level of the parent. The pattern, which was similar with respect to the educational level of both first and second parent, was shown on the WISC with the education of the first parent and on the HFD test with the education of the second parent (table 10).

Prenatal Care, Complications

The extent of prenatal care and complications during pregnancy for the mothers of these children age 6-11 years in the present national study have been described in a previous report.[11] Some prenatal medical care had been obtained for more than 97 percent of the mothers of these children. Medical problems or complications during this pregnancy were reported for 13 percent, nearly all of whom had consulted a doctor regarding the condition.

No relationship was found between the intelligence of these children and whether their mothers had had complications during this pregnancy. The mean deviation IQ's on both measures of intelligence were approximately 100 for the 13 percent whose mothers had such problems indicated on the child's birth certificate and for the 87 percent whose mothers did not (table 11). Those whose mothers had obtained some prenatal care during this pregnancy tested somewhat higher than those whose mothers did not, although the differences no longer existed when the effect of parent education was removed.

Condition of Child at Birth

Birthweight.—Available information from the medical history given by the mother for the children 6-11 years of age in this survey and from the child's own birth certificate showed that nearly 3 percent had weighed less than 5 pounds at birth, 96 percent between 5 and 10 pounds, and the remaining 1 percent more than 10 pounds.[11]

Children who weighed between 5 and 10 pounds at birth rated higher on the two measures of intelligence than those who weighed less than 5 pounds or more than 10 pounds (table 12 and figure 5). Mean differences on the WISC were 5 and 4 standard score points, respectively, for those who weighed less than 5 pounds or more than 10 pounds. On the HFD test they were nearly 4 and 2 standard score points, respectively. Only on the measure of intellectual maturity (HFD) was the mean difference between the scores for those essentially normal weight at birth and the heavier babies small enough to be due to sampling variability alone, i.e., not statistically significant at the 5-percent probability level.

When the more detailed birthweight data from the birth certificate are used, the increase in mean deviation IQ with weight (at birth) is slow but consistent up to about 8 pounds, as illustrated in table B for the WISC short-form findings. For boys this increase was from 89 among those weighing less than 3 pounds 5 ounces at birth to over 102 for those weighing between 7 pounds 12 ounces and 8 pounds 13 ounces. Girls showed a similar consistent but

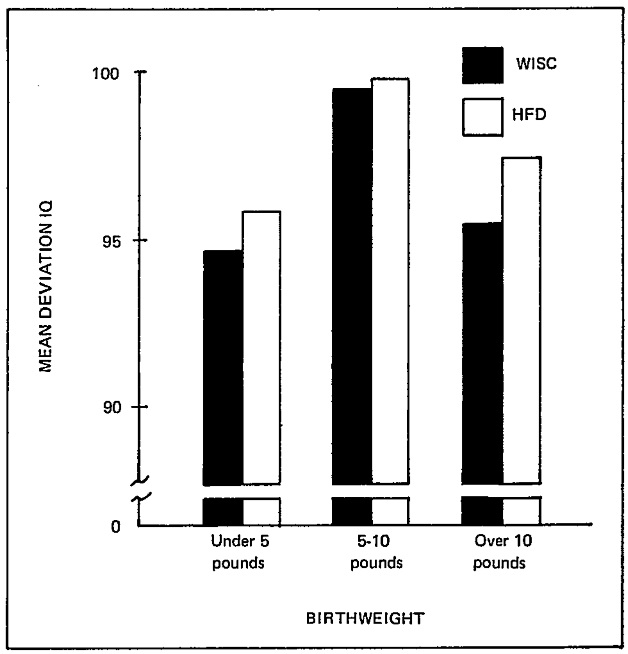

Figure 5. Mean deviation IQ on the short form of the Wechsler Intelligence Scale for Children (WISC) and on the modified Goodenough-Harris Human Figure Drawing (HFD) tests for children 6-11 years of age, by weight at birth: United States, 1963-1965.

Table B. Mean deviation IQ and standard error of mean on the WISC short form, by birthweight and sex for children 6-11 years: United States, 1963-1965

Birthweight from birth certificate	Deviation IQ			
	Boys	Girls	Boys	Girls
	Mean		Standard error	
Less than 3 pounds 5 ounces	89.4	90.3	*	1.50
3 pounds 5 ounces-4 pounds 6 ounces	94.2	95.1	2.70	1.80
4 pounds 7 ounces-5 pounds 8 ounces	96.2	96.0	1.40	1.00
5 pounds 9 ounces-6 pounds 10 ounces	98.1	97.0	0.90	0.70
6 pounds 11 ounces-7 pounds 11 ounces	101.4	98.3	0.70	0.60
7 pounds 12 ounces-8 pounds 13 ounces	102.4	99.9	0.90	0.70
8 pounds 14 ounces-9 pounds 14 ounces	102.0	97.1	1.30	1.50
9 pounds 15 ounces-11 pounds 0 ounce	97.7	97.7	1.70	4.10

slightly smaller gain in mean IQ, from 90 to 100 over the same birthweight span.

Length of hospitalization.—Those children who were kept in the hospital 2 weeks or less following their birth rated higher on both measures of intelligence, on the average, than those who were retained for over 2 weeks. Mean differences were large enough to be statistically significant on WISC (both Vocabulary and Block Design) and on the Woman but not on the Man Scale of the HFD test. The group who required more than 2 weeks of hospital care at that time (3 percent of the children) would have included a large proportion of those born prematurely, with birth injuries, congenital malformations, and other medical problems.[11]

Congenital malformations and birth injury.—Children for whom a congenital malformation or a birth injury was recorded and identified on the birth certificate obtained somewhat lower mean standard scores on the WISC (both Vocabulary and Block Design), but not on the HFD test, than those for whom no abnormality was noted at birth. However, the proportion of children who had such conditions was so small, i.e., less than 2 percent, that the mean differences in standard score could easily be due to sampling variability alone.

Handedness.—Among these children 6-11 years of age at the time of this study, approximately 11 percent were left handed and the remaining 89 percent right handed, with a negligible proportion (0.1 percent) ambidextrous.

Mean deviation IQ's for right-handed children were nearly identical to those for left-handed children on both measures of intelligence and on the four subtests or parts. The substantially lower mean standard scores for the ambidextrous group are probably due to sampling variability alone, i.e., not significant at the 5-percent level.

Twin status.—Twins were found to score slightly but not significantly lower than the single-born children on both the measure of intellectual development and that of intellectual maturity. Mean differences in deviation IQ between nontwins and twins, as well as between fraternal and identical twins, were small enough to be due to sampling variability alone since only about 2 percent of these children were twins.

Early Developmental History

Information on the early developmental history of these children 6-11 years of age at the time of this study—including the age they first started walking by themselves or speaking their first real word and the relative speed with which they learned to do things by themselves—have been described and analyzed previously.[12]

Change from breast feeding.—Children who were reported by their mothers at the time of the survey to have had no trouble accepting the change from breast feeding[11] (91 percent of those breast fed) generally rated slightly but not significantly higher (mean difference of 2-3 standard score points) on the survey measures of intellectual development and intellectual maturity than the remaining 9 percent of children who were reported to have had some or a considerable problem switching to regular food (table 13).

Walking.—The intelligence of children who first walked by themselves before the age of 1 year was, on the average, similar to that for children who did not start walking until 12 to 18 months of age. Mean deviation IQ's on the measures of intellectual development and intellectual maturity were approximately 100 for both those who started walking early and those who started at the more usual age (table 13 and figure 6).

However, among children who did not walk alone until after 18 months of age (nearly 4 percent of the children), the mean deviation IQ in both the WISC and the HFD test was substantially lower—about 10 points less than for those who walked alone by or before 18 months. Mean differences were statistically significant at the 1-percent probability level on both tests and the four subtests or parts. The mean difference or lag for this physically retarded group was slightly greater on the Vocabulary subtest and Man Scale of the HFD test than on the Block Design subtest and the Woman Scale of the HFD test (12 and 11 standard score points compared with 8 and 9).

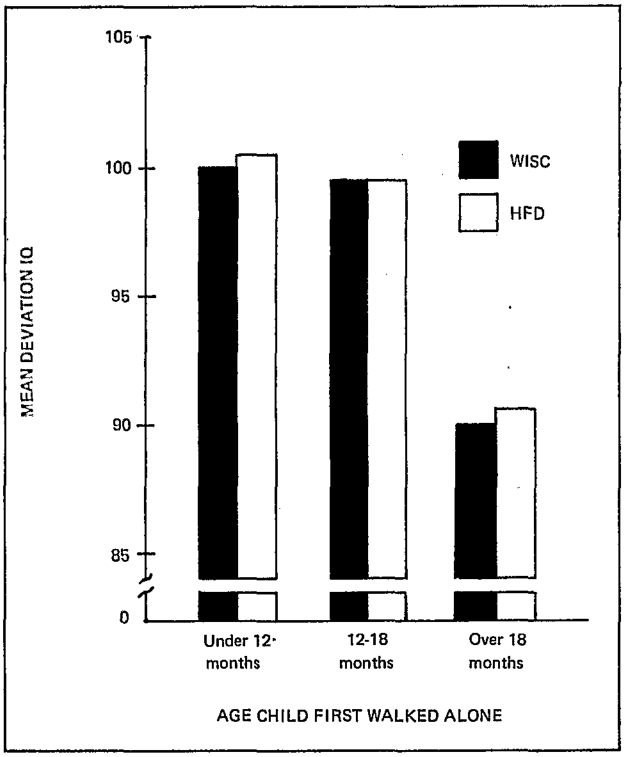

Figure 6. Mean deviation IQ on the short form of the Wechsler Intelligence Scale for Children (WISC) and on the modified Goodenough-Harris Human Figure Drawing (HFD) tests for children 6-11 years of age, by age child first walked alone: United States, 1963-1965.

Both boys and girls who started walking later than usual were also significantly and similarly retarded in mean deviation IQ on these intelligence tests.

Speech.—Children who did not speak their first word until after 18 months of age (8 percent) were also significantly lower in intelligence as measured in this survey on either the short form of the WISC or the modified HFD test than those who started speaking earlier. Their mean deviation IQ's on both tests were 7 points behind those who started talking before the age of 1 year and 5 points behind those who began between 12 and 18 months of age (table 13 and figure 7). The differences in mean standard scores among all three groups—those who started talking early, at the more normal age, or later—were too large to be due to sampling variability alone, i.e., statistically significant at least at the 5-percent level. The extent of retardation in deviation IQ among those starting to speak later than usual was slightly greater on the Vocabulary subtest than on the other subtests. Among girls and boys there was a similar pattern of lower intelligence levels, on the average, among those starting to talk later than usual.

Learning speed.—Mothers' ratings of the speed with which their children learned to do things such as eating or dressing by themselves is generally consistent with their children's later performance at ages 6-11 years on these intelligence tests at the time of the survey. Those children considered by their mothers as learning faster than other children had significantly higher mean deviation IQ's on both intelligence tests (scores of 103 on the WISC and 102 on the HFD) than those whose learning speed was

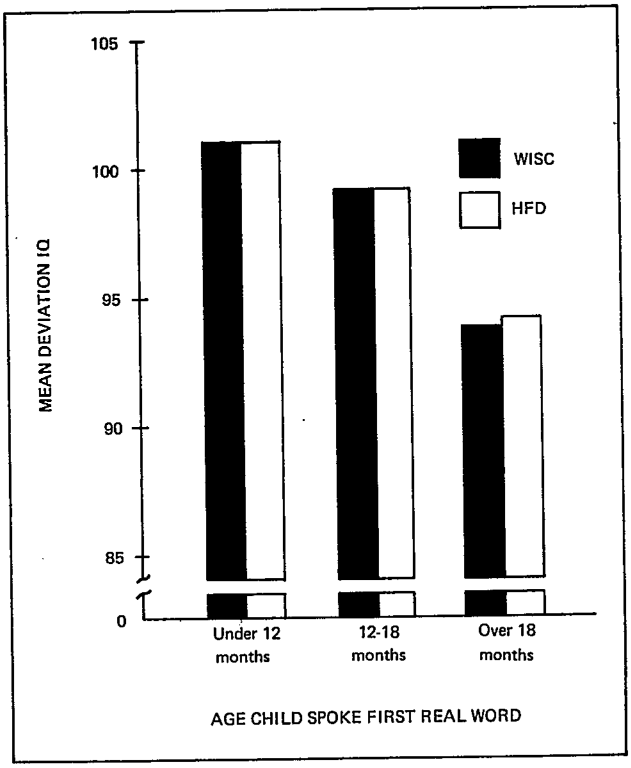

Figure 7. Mean deviation IQ on the short form of the Wechsler Intelligence Scale for Children (WISC) and on the modified Goodenough-Harris Human Figure Drawing (HFD) tests for children' 6-11 years of age, by age child spoke first real word: United States, 1963-1965.

considered average (scores of 99 on both tests). The latter group, with average learning speed, rated substantially higher on these tests than those reported to have been slower in learning than other children (mean scores of 89 on the WISC and 91 on the HFD). These differentials were found on all four subtests among both boys and girls.

Health at 1 Year

At the end of their first year of life, 91 percent of the children 6-11 years of age were reported to have been in good health, nearly 8 percent in fair health, and nearly 2 percent in poor health, according to the information given by their mothers at the time of this survey, as previously described.[11]

Those children whose mothers reported them to have been in good health at 1 year of age rated significantly higher on both measures of intelligence used in the study than those considered in fair or poor health at that earlier period. The pattern was similar on both tests: the respective mean deviation IQ's on the WISC by infant health status were 100, 97, and 93; and on the HFD they were 100, 98, and 93 (table 13). The relationship of infant health status to intelligence of children 6-11 years of age was consistent among both boys and girls on all four subtests.

Medical Problems

Medical history of neurological problems.—The medical histories for the children obtained from the mother just prior to their examination indicated that 0.3 percent were known to have epilepsy and 0.1 percent cerebral palsy, as previously described.[13]

Those children reported to have cerebral palsy tested more than 15 standard score points below other children, on the average, on each of the tests and subtests of intelligence used in the survey (table 14), mean differences that on the WISC and HFD were statistically significant at the 5-percent probability level despite the low prevalence of this condition. Those with a history of epilepsy also had significantly lower mean deviation IQ's on these tests than other children, but the mean differences were substantially smaller, 5 standard score points on the WISC and 8 on the HFD.

Medical findings on examination.—From the medical findings on physical examination at the time of the survey, the prevalence of heart conditions among U.S. children 6-11 years was estimated as 2.6 per 100 children and for neuromuscular joint conditions as 3.6 per 100 (table 14 and figure 8). In addition 3.6 per 100 children were found to have some other type of medical condition. These findings were based on the medical history made available to the examining pediatrician and his own diagnostic findings at the time of the survey examination.[13] Information from the birth certificates available for 60 percent of these children showed that a congenital malformation with or without a birth injury had been evident at birth for 1.0 percent and that an additional 0.3 percent had a birth injury only. It should be kept in mind that all three sources of information—the birth certificate, the medical his-

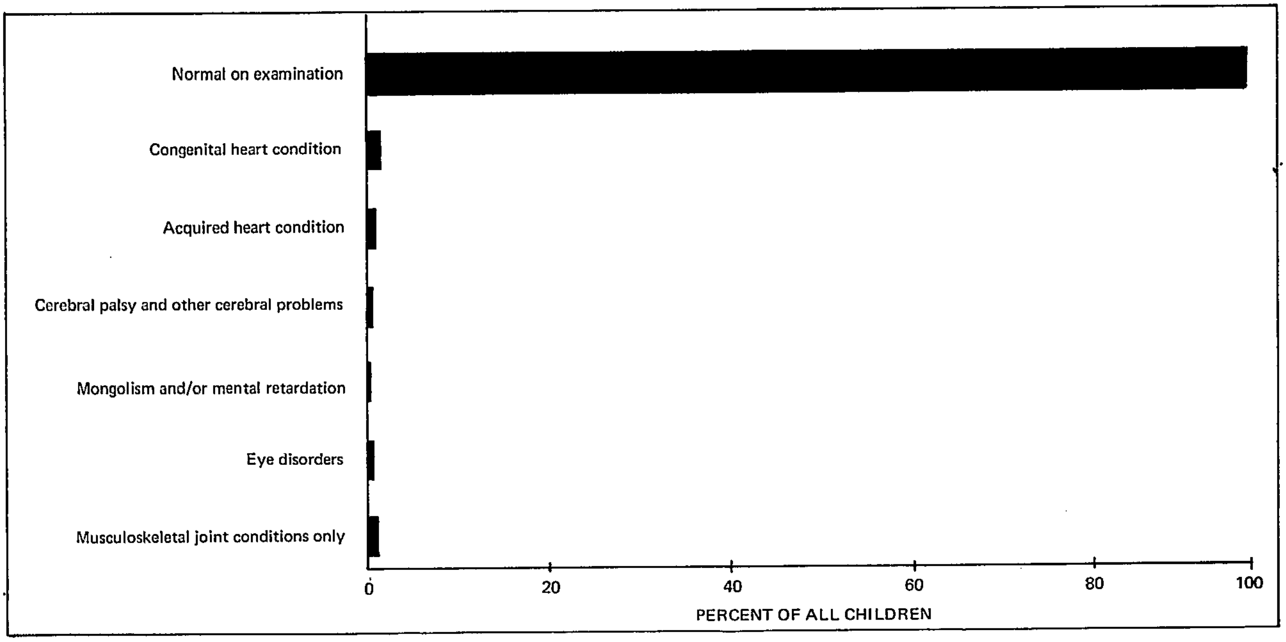

Figure 8. Percent of children 6-11 years of age, by specific finding on survey physical examination: United States, 1963-1965.

tory, and the examination—are subject to observer differences.

The examining pediatrician considered 80 percent of the heart conditions and 60 percent of the neuromuscular joint conditions found or identified on examination in the survey to have been congenital.

Those children with congenital heart or neuromuscular joint conditions found or identified on examination scored substantially lower on both measures of intelligence used in the survey than children without such physical conditions and slightly below those whose heart or neuromuscular joint condition was considered to have been acquired. Mean deviation IQ's for those children with congenital heart conditions were 5 standard score points below and those with acquired heart condition about 3 points below those without heart conditions on both types of intelligence tests (WISC and HFD). Those children with congential neuromuscular joint conditions had mean deviation IQ's on the HFD 8 standard score points below and on the WISC nearly 6 standard score points below the respective mean deviation IQ's for children without such conditions (table 14 and figure 9).

A further review of the specific type of neurological joint conditions indicated that 0.5 percent of the children in this study had a neurological condition identified as cerebral palsy, other cerebral problem, or minimal cerebral dysfunction; 0.3 percent were identified on examination as mongoloid and/or mentally retarded, 0.6 percent as having eye muscle disorders, and 2.2 percent as having only musculoskeletal joint conditions.

Findings from the measure of intellectual development (WISC) used in the survey show significantly lower mean deviation IQ's for those children with a condition identified by the pediatrician as mongolism and/or mental retardation or as cerebral palsy, other cerebral problem, or minimal cerebral dysfunction than for those children with eye disorders or musculoskeletal joint conditions, as may be seen in table 14.

Preschool Educational Experience

On the medical history obtained prior to the survey examination of these children 6-11 years of age the mother was asked whether the child had attended kindergarten and/or nursery school. Seventy percent of these children were reported to have had such preschool educational experience. The mean deviation IQ's for children with this experience was significantly greater than for those without it, 7 standard score

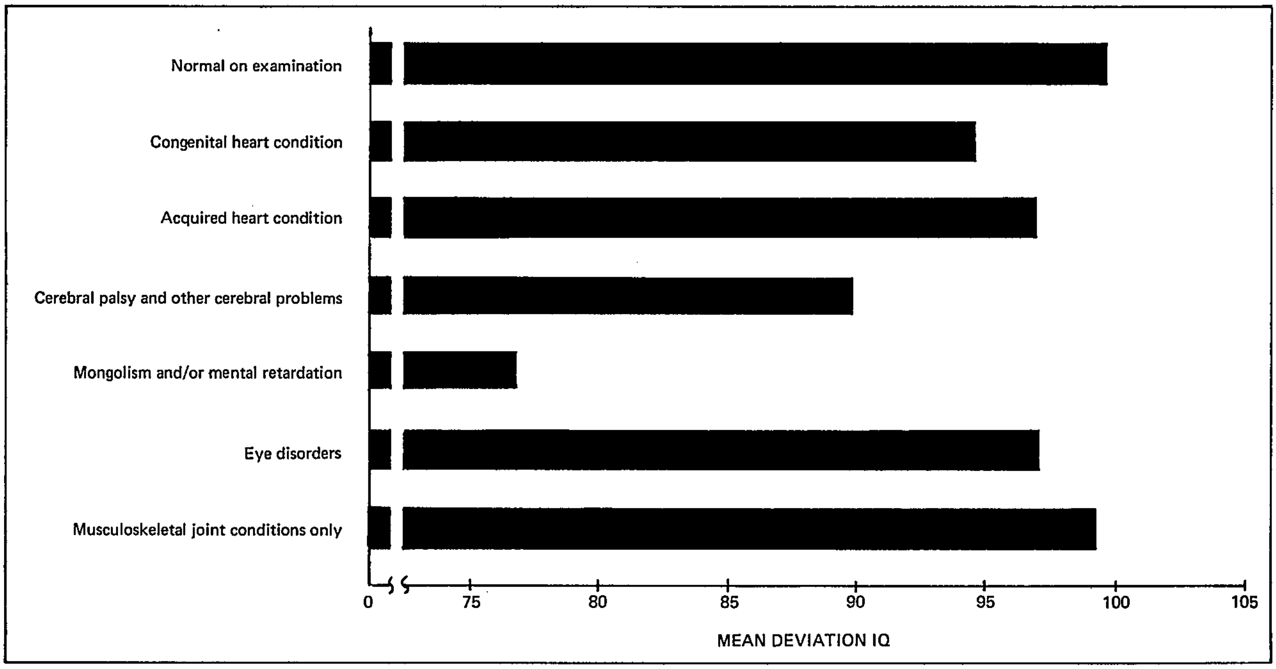

Figure 9. Mean deviation IQ on the short form of the Wechsler Intelligence Scale for Children (WISC) for children 6-11 years of age, by specific findings on survey physical examination: United States, 1963-1965.

points greater on the WISC and 4 points greater on the HFD. The differential existed on both the Vocabulary and Block Design subtests of the WISC (mean differences of 8 and 6 standard score points, respectively) but only on the Woman Scale of the HFD, and on that to a lesser extent (3 standard score points).

When considered in relation to the educational level of first parent for white and Negro children, those with preschool educational experience consistently scored slightly higher, 2 to 6 standard score points on the average, on the WISC Vocabulary and Block Design subtests and on the HFD test than those without such experience at each level of parent education (table 15). The only exception was on the HFD test for white children whose parents had completed less than 5 years of formal schooling.

The relationship between educational level of parent and deviation IQ of the child was stronger on the WISC for white than for Negro children but of approximately the same order of magnitude on the HFD test for both racial groups among children with and without some preschool educational experience. Hence, for children of both racial groups, preschool educational experience does seem to have a slight positive influence on their standard scores on these intelligence tests even when the effect of the educational level of their first parent is held constant.

DISCUSSION

Factors in the family background and early developmental history of children considered in this report in relation to their measured intelligence will themselves generally be influenced by various aspects of both heredity and environment in varying degrees. The contributions of both have been the subject of extensive study for over half a century since Binet's early work with intelligence testing.[14] Studies of twins such as that of Scarr-Salapatek[15] have attempted to estimate the proportion of variability in general intelligence scores due to heredity and environment among the advantaged and disadvantaged. However, this report is limited to national estimates of the pattern of interrelation of the factors considered with measured intelligence. Comparisons are made insofar as possible with previous relevant findings among children, although almost without exception the previous studies have used tests of intelligence different and not precisely comparable to those used in the present national survey.

Family Background

The strong direct association between both the intellectual development and intellectual maturity of U.S. children 6-11 years of age and the educational attainment of their parents found in the present national study are consistent with previous findings among those groups of children studied by Bayley[16] and Honzik.[17]

Younger children in the present study whose mothers were foreign born, and hence would have included a disproportionate number who were bilingual, rated lower on the verbal but not on the performance tests of intelligence used in this study than did children of comparable age of native-born mothers, consistent with the findings from nearly 100 investigations in the United States and other countries with respect to intelligence test scores of younger bilingual versus monolingual children.[18]

The pattern of association between maternal age and intellectual functioning of children from the present study (lower deviation IQ's for children whose mothers were under 20 years and those 40 years and over) is similar to but even more pronounced than that found by Lobl[19] at Johns Hopkins in his study of more than 3,000 births among mothers from middle and lower sociocultural groups. He attributed the depressed IQ's for children of younger mothers to a number of biological and environmental factors including physiological and anatomic immaturity influencing maternal reproductive capacity and immaturity of maternal behavior with respect to child-rearing practices. The occurrence of mongolism and other anomalies of the central nervous system he found to be strongly related to advancing maternal age, with over half of the reported cases of such conditions in his study being among children of mothers 36 years and older.

With respect to the effect of paternal age on intelligence of children, Newcombe and Tavendale[20] found, among their study group in British Columbia, a significant paternal age effect which is essentially independent of the effect of maternal age for fathers 45 years and older consistent with results from the present study. In particular, congential malformations were substantially more frequently found among children with older fathers.

The negative relationship of family size, i.e., number of live siblings, to the intelligence of U.S. children in the present study was more pronounced on the verbal than on the performance tests and stronger among those whose parents had no college education than those whose parents did. This relationship is consistent with findings of Anastasi,[21,22] Bajema,[23] Higgins,[24] and Nisbet.[25,26] The relative differential in verbal and nonverbal development has been attributed to different degrees of adult contact provided in families of different size and of different economic levels. However, studies of Dawson[27] and O'Hanlon[28] among some 1,200 Glasgow children showed an even stronger negative or inverse relationship between intelligence (Stanford-Binet tests) and family size when all births, including stillbirths, were considered than when limited to live siblings in the family. This is also consistent with findings from the present study where there is a more marked difference in mean deviation IQ between single children and those with one or more stillborn or deceased siblings than with one or more live siblings.

The influence of ordinal birth position on measured intelligence has been investigated for some 100 years. Altus,[29] in a review article, cites analyses of persons in *Who's Who, Rhodes Scholars, English Men of Science,* and similar select groups showing predominance of the first born. Sir Francis Galton in the 1874 *English Men of Science* suggested that through the law of primogeniture the eldest son was likely to become possessed of independent means and to be able to follow his own tastes and inclinations. Furthermore, he speculated that parents treated an only child and a first born as a companion and accorded him more responsibility than other children. More recent findings of Chittenden et al.[30] showed differences between siblings on grades and test scores that significantly favor the first born. In the present national study, while a significant inverse relationship was found between age order and performance on the intelligence tests used, the mean difference between the first and second born was negligible.

Condition of Child at Birth

Birthweight.—The significantly lower mean levels of both measured intellectual development and intellectual maturity among U.S. children of below and above normal birthweight than among those of more normal birthweight (5-10 pounds) are consistent with findings from available previous studies. Babson et al.,[31] in his collaborative perinatal study among 4-year-old Oregon children, found the mean IQ (Stanford-Binet) of the oversized birthweight group to be 3.5 points below those of standard birthweight.

Various studies have been concerned with the effect of prematurity or low birthweight on physical and mental development. Weiner[32] indicated in his review of available studies prior to 1962 that of the 18 studies reported, only one failed to find premature subjects at a disadvantage in regard to IQ. More recent studies of Weiner et al.[33,34] have indicated that impairment (intellectual) in low birthweight infants is largely due to associated measurable indexes of minimal neurological involvement. Retarded growth in premature babies has been attributed in many cases to the effect of placental insufficiency. Yoshida et al.[35] recently demonstrated an altered pattern of energy metabolism in leukocytes of premature (small for gestational age) infants similar to that found in young infants with severe postnatal protein-calorie malnutrition, thus lending support to the concept that fetal growth retardation may be a manifestation of malnutrition *in utero*. On autopsy of a group of small-for-gestational-age and normal birthweight infants, Chase et al.[36] found the cerebellum to be the area of the brain most greatly affected by intrauterine underdevelopment.

Congential malformations and birth injuries.—Since the population under study excludes institutionalized children, the lack of a demonstrable association between measured intelligence and the presence or absence of a congenital malformation or injury identified at the time of birth for U.S. children is not unexpected, with the low prevalence of such conditions recorded on the birth certificate. The 1970 report of a WHO Scientific Group on Genetic Factors in Congenital Malformations,[37] in summarizing available research findings, indicates that about 1 percent of all liveborn and stillborn children have or will develop signs of a harmful single-gene trait and that a further 1 percent have chromosomal abnormalities, many of which determine severe handicaps. In addition, some 3-4 percent of all liveborn and stillborn children have congenital malformations, as defined by the WHO group, although, as many of these affect internal organs, they may not be recognized until long after birth or at autopsy. These WHO estimates are generally consistent with those for U.S. children from the present study. In a small proportion, the WHO report indicated there is a known teratogenic agent—e.g., maternal rubella, toxoplasmosis, or exposure in early intrauterine life to ionizing radiation or to toxic agents or drugs. However, the majority of such conditions have a genetic component, and almost all have indirect evidence of an environmental component also.

Twin status.—National estimates from the present study showed twins to have rated slightly but not significantly lower, on the average, than the single-born child on the verbal component of the test of intellectual development (WISC-Vocabulary) and on the test of intellectual maturity (HFD). On the performance component of intellectual development (WISC-Block Design) twins did as well as nontwins.

These findings are somewhat less marked than those of Mittler[38] and Record, McKeown, and Edwards[39] in England and Husen[40] in Sweden. Mittler, in his study of 4-year-old English children (200 twins and 100 singletons), found the twins to be more retarded than the nontwins in language development and also found some indication of overall immaturity. Record, McKeown, and Edwards, in their study of Birminghan children (48,913 single born and 2,164 twins), showed twins to do less well on the standard "eleven-plus" test of verbal reasoning than nontwins. They attributed this primarily to less frequent association of twins with adults. Husen, in his study among 2,700 single borns and 1,000 twins in Sweden, found that twins did not do as well on achievement tests and in school marks as the single born.

Much of the difference between findings from the present study among U.S. children and those from the English and Swedish studies is probably due to the lack of comparability of the tests used.

Early Developmental History

Walking.—The strong association between delayed walking (starting after 18 months) and the intellectual development and maturity of U.S. children in the present study is consistent with previous findings among various groups in the population. Donoghue et al.[41] found that only 11 percent of English children in a ward for the mentally retarded had learned to walk before the end of the second year compared with 95 percent of infants from a well-baby clinic who walked unaided by age 10-14 months. Neligan and Prudham[42] found from the Newcastle Survey of Child Development that children later excluded from normal school because of mental defect, cerebral palsy, or deafness showed a significant delay in walking unaided.

Speech.—The relationship between intelligence, as measured in this study, and the retardation of speech development is nearly as strong as that between intelligence and walking. This also would have been expected since the major causes of speech delay have generally been found to be mental retardation, functional (emotional), brain injury, and hearing loss.[43,44] In the Newcastle Survey[42] Neligan and Prudham also found that children later excluded from normal school on account of mental defect, cerebral palsy, or deafness showed a significant delay in using sentences.

Children in the present national study with articulation problems (8 percent of all children) also had lower standard scores on these intelligence tests than those whose parent indicated they had no trouble talking. This is consistent with findings of Martyn, Sheehan, and Slutz[45] for mentally retarded patients in a California hospital where nearly one-third had articulation disorders.

Medical Problems

Conditions affecting the development or functioning of the nervous system, primarily *cerebral palsy* and *epilepsy,* have been found repeatedly to be more prevalent among the mentally handicapped than among the general population.[42-44,46] In particular, Drillien et al.,[46] in their studies of the mentally handicapped children in Edinburgh, in and outside of institutions, found over one-half to have cerebral palsy and about one-sixth to have epilepsy.

While the present study among U.S. children is limited to the noninstitutional population and hence excludes a substantial proportion of the more severely mentally handicapped in this country, the relation of these conditions to measured intellectual development and maturity is clearly apparent. Those U.S. children with a history of cerebral palsy, though varying substantially in performance, obtained mean standard scores on both intelligence tests that were more than 1 standard deviation below the mean for all children (16 and 21 standard score points lower, respectively); while those with a history of epilepsy, who also varied widely in performance, as a group tested one-third to one-half a standard deviation below the mean for all children (5 standard score points on the WISC and 8 on the HFD). Those with a history of epilepsy, but not the cerebral palsied, were less retarded on the Block Design than the Vocabulary subtest of the WISC.

For children with cerebral palsy and epilepsy, the presence or extent of mental deficiency would depend on the area of and degree to which the brain was affected.

Cerebral palsy—the group of conditions affecting control of the motor system due to lesions in various parts of the brain and occurring as a result of birth injury or prenatal cerebral defect—is more frequently associated with severe mental deficiency.

As summarized recently by Stores,[47] previous research on the cognitive function in children with epilepsy (among whom proportionately fewer appear to be mentally impaired) indicates that among persons with epilepsy temporal lobe lesions in the hemisphere dominant for speech cause impairment of verbal abilities (including defects of retention and learning of verbal material); while performance on tests of visuospatial or perceptual-motor abilities and of memory for nonverbal material is impaired by lesions of the temporal lobe in the nondominant hemisphere.[48-53]

In contrast with patients with temporal lobe attacks, those with "centrecephalic" epilepsy have been shown to have no obvious memory defect, but to be impaired on tests of sustained attention.[54]

In further recent research on the comparative performance of noninstitutionalized epileptic and nonepileptic children, Green and Hartlage[55] concluded that the reason epileptic children scored below expectancy levels in school achievement and language usage may be that parental expectations tend to be lower for them than if they were not epileptic. This hypothesis would be consistent with the poorer performance among U.S. children shown on the Vocabulary than on the Block Design subtests of the WISC from the present study.

Previous studies have suggested that children with significant congenital heart defects, especially of the cyanotic type, may have delayed motor development and a higher-than-expected incidence of mental subnormality[56-59] consistent with findings from the present study among U.S. children. Findings from these earlier studies were mixed with respect to the influence of hemodynamic severity of the lesion, but several suggest that environmental deprivation due to physical incapacity may be a factor.

Preschool Experience

The slight advantage evident in this study on the measures of intellectual development and intellectual maturity of children who had some preschool educational experience, such as that in kindergarten or nursery school, over those who had none is not inconsistent with findings from several previous studies.

McHugh,[60] in his 1940 study of children entering public school kindergarten in a small town in New Jersey, found significant gains in IQ score resulting from preschool experience when the Stanford-Binet tests were given under standard conditions and when the initial test was given before any preschool experience. He further concluded that since these gains occurred so rapidly it was more likely they were due to better adjustment of the testee in the test situation than any real growth in intellectual capacity.

Earlier studies of Wellman[61] at the University of Iowa Child Welfare Research Station found that length of preschool experience beyond 1 year bears a direct relation to the amount of gain in intellectual capacity.

In a number of reports from established child research centers throughout the United States—including those of Anderson,[62] Bayley,[63,64] Bird,[65] Frandsen and Barlow,[66] Goodenough and Maurer,[67] Lamson,[68] Olson and Hughes,[69] and Voas[70]—the investigators were unable to conclude from the results of their researches that preschool experience has any appreciable effect upon the IQ.

A subsequent study by Wellman and McCandless[71] at the Iowa Child Welfare Research Station found evidence suggesting that teacher contacts at the station preschools play a definite role in the verbal aspects of mental development, particularly of children in their first year of preschool experience, but that verbal aspects of intelligence are not the aspects in which preschool is most stimulating to IQ change.

More recently Cicarelli et al.,[72] in their evaluation of the effect of the Head Start programs, found slight but statistically significant superiority of full-year Head Start children on certain measures of cognitive development. In their review of the existing evaluative studies, they also found that these preschool curricula achieve little unless they focus on language and number concepts.

SUMMARY

This report contains national estimates of the prevalence of selected congenital or other early developmental health problems and describes the relationship of selected aspects of family background, infant health status, and early developmental history to the intellectual development and maturity of noninstitutionalized children 6-11 years of age in the United States, based on findings from the National Health Examination Survey of 1963-1965. For this national study, the probability sample of 7,417 children selected was representative, and the 7,119 (96 percent) examined were closely representative of the 24 million noninstitutionalized children 6-11 years of age at that time.

The measures of intellectual development used were the short form of the WISC (Vocabulary and Block Design) and the modified HFD tests.

The principal findings from this study are that

- The relationship between intellectual development or intellectual maturity of children and the academic achievement of their second parent, or mother, was as strong as that previously found for this group with the educational level of their first parent, or father.

- Children 6-11 years of age whose mothers were foreign born generally did as well as children whose mothers were natives of this country on the tests of intellectual development and intellectual maturity used in this study except for younger children on the verbal component (WISC-Vocabulary).

- Mean deviation IQ scores of these children 6-11 years of age increased with the age of their mother and their father at the time of their birth to a maximum at 25-39 years for maternal age and 25-44 for paternal age. Those whose parents had been older, 40 years or more for the mother and 45 years or older for the father, showed lower mean scores than those whose parents had been younger at the time these children were born.

- The intelligence of children (mean deviation IQ) on both measures used in this study was found to decrease consistently as the number of other live children in the family increased. When controlled on educational level of the first parent, that pattern of indirect association with family size on the WISC Vocabulary subtest persisted but was less marked or consistent on either the WISC Block Design or the modified HFD.

- Children who were of relatively normal weight at birth, 5-10 pounds, rated significantly higher on both measures of intelligence used in this study than those who weighed under 5 pounds or more than 10 pounds.

- Twins were found to score slightly but not significantly lower than single-born children on both measures of intelligence.

- Children whose walking or speech was retarded beyond 18 months of age showed significantly lower mean deviation IQ's on both measures of intelligence.

- Prevalence estimates for medical conditions specifically identified on examination or history for these noninstitutionalized U.S. children 6-11 years of age including epilepsy, cerebral palsy, mongolism, eye-muscle disorders, and heart and musculoskeletal joint conditions were obtained. Those children with such medical conditions tended to show significantly lower mean deviation IQ scores than children without these problems.

- Children with some preschool educational experience—i.e., who had attended kindergarten or nursery school—generally showed some advantage in deviation IQ scores over those without such preschool training even when the effect of the educational attainment of their parent(s) was held constant.

Comparisons with relevant findings from previous available studies are included.

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LIST OF DETAILED TABLES

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Education of father and of mother	WISC			HFD			Number of children in thousands	Percent of children
	Combined	Vocabulary	Block Design	Combined	Man Scale	Woman Scale		
Father (1st parent)	Mean deviation IQ							
Less than 5 years	86.1	83.8	89.5	90.4	91.0	92.5	1,419	7.1
5-8 years	93.9	93.6	95.4	96.8	97.9	97.6	4,116	20.6
9-12 years	100.2	101.0	100.6	100.0	101.1	100.9	10,189	51.0
13 years or more	107.7	109.7	107.1	104.5	105.0	105.8	4,256	21.3
Mother (2d parent)								
Less than 5 years	86.0	82.9	90.0	89.6	91.0	90.3	839	4.1
5-8 years	92.5	91.4	94.7	96.1	97.4	97.0	3,314	16.2
9-12 years	100.9	101.8	101.3	100.6	101.6	101.4	13,070	63.9
13 years or more	108.3	110.3	107.7	103.7	104.1	105.1	3,232	15.8
Father (1st parent)	Standard error of mean							
Less than 5 years	0.86	1.52	0.51	0.85	1.34	1.54	---	---
5-8 years	0.76	0.83	0.75	0.68	0.86	0.64	---	---
9-12 years	0.30	0.49	0.31	0.39	0.48	0.41	---	---
13 years or more	0.52	0.59	0.71	0.53	0.61	0.61	---	---
Mother (2d parent)								
Less than 5 years	1.30	2.10	0.92	1.27	1.89	1.77	---	---
5-8 years	0.72	0.98	0.58	0.65	0.91	0.86	---	---
9-12 years	0.32	0.43	0.43	0.48	0.55	0.51	---	---
13 years or more	0.85	0.77	1.08	0.60	0.72	0.61	---	---

Table 2. Mean deviation IQ and standard error of the mean on the short form of the Wechsler Intelligence Scale for Children (WISC) and the modified Goodenough-Harris Human Figure Drawing (HFD) tests for and number and percent distribution of children 6-11 years of age, by educational attainment of mother and of father: United States, 1963-1965

Education of father and of mother	WISC Combined	WISC Vocabulary	WISC Block Design	HFD Combined	HFD Man Scale	HFD Woman Scale	WISC Combined	HFD Combined	Number of children in thousands	Percent of children
	Mean deviation IQ						Standard error of mean			
Father, under 5 years										
Mother:										
Under 5 years	84.7	81.0	89.3	89.4	89.6	91.9	1.98	2.36	502	35.4
5-8 years	87.1	84.5	90.7	92.0	91.6	96.0	0.74	1.68	646	45.5
9-12 years	86.1	85.5	87.9	90.3	93.1	90.0	1.28	1.08	264	18.6
13 years or more	95.6	102.5	90.5	94.8	97.0	-	67.62	67.06	7	0.5
Father, 5-8 years										
Mother:										
Under 5 years	88.0	86.6	90.4	90.6	91.3	91.6	2.26	2.78	193	4.7
5-8 years	92.3	91.9	93.8	95.9	97.6	96.4	0.96	0.80	1,531	37.2
9-12 years	96.7	96.7	98.0	98.0	98.8	98.9	0.70	0.94	2,250	54.7
13 years or more	101.3	100.7	103.2	104.3	104.8	105.2	2.79	1.80	140	3.4
Father, 9-12 years										
Mother:										
Under 5 years	89.3	86.3	93.3	91.6	96.7	88.7	1.49	2.84	132	1.3
5-8 years	96.2	94.8	98.6	98.6	99.9	99.5	1.02	1.19	978	9.6
9-12 years	101.3	102.3	101.6	100.6	101.7	101.2	0.30	0.47	8,223	80.7
13 years or more	104.4	105.9	104.2	100.7	101.0	103.2	0.93	0.86	856	8.4
Father, 13 years or more										
Mother:										
Under 5 years	-	-	-	-	-	-	-	-	-	-
5-8 years	103.8	104.3	104.5	104.5	106.8	102.2	2.62	2.67	94	2.2
9-12 years	105.6	107.3	105.2	104.4	104.7	105.8	0.48	0.72	2,124	49.9
13 years or more	110.2	112.6	109.3	104.8	105.3	105.9	1.02	0.76	2,039	47.9

Table 3. Mean deviation IQ and standard error of the mean on the short form of the Wechsler Intelligence Scale for Children (WISC) and the modified Goodenough-Harris Human Figure Drawing (HFD) tests for and percent distribution of children 6-11 years of age, by place of birth of mother, age, and sex: United States, 1963-1965

Age and sex	WISC						HFD						Percent of children		Percent of children with mother born in	
	Combined		Vocabulary		Block Design		Combined		Man figure		Woman figure					
	U.S.[1]	Foreign[1]	U.S.[1]	Foreign[1]	U.S.[1]	Foreign[1]	U.S.[1]	Foreign[1]	U.S.[1]	Foreign[1]	U.S.[1]	Foreign[1]	U.S.[1]	Foreign[1]	U.S.	Foreign country
	Mean deviation IQ															
Total, 6-11 years	99.6	91.9	100.3	87.1	100.2	98.2	99.6	100.1	[illegible]	101.6	100.6	100.3	100.0	100.0	96.6	3.4
6 years	99.8	87.0	100.5	80.0	100.1	95.3	99.6	94.9	101.3	95.9	100.8	97.6	17.3	26.3	...	...
7 years	99.4	88.4	100.3	82.7	100.2	96.2	99.6	98.1	100.5	101.3	100.9	97.3	17.2	18.1	...	...
8 years	99.9	94.1	100.6	86.6	100.2	103.0	99.4	100.7	100.4	100.4	100.4	104.1	16.7	14.8	...	...
9 years	99.4	92.0	100.2	88.0	100.0	97.7	99.6	102.6	100.3	106.1	100.6	100.0	16.7	17.2	...	...
10 years	99.6	98.6	100.0	95.4	100.0	102.4	99.6	102.6	100.2	105.1	100.2	100.9	16.2	17.9	...	...
11 years	99.6	98.9	100.3	106.0	100.4	93.8	100.1	102.6	100.5	101.7	100.7	102.6	15.9	5.7	...	...
Boys, 6-11 years	101.1	93.4	102.0	90.7	101.3	97.6	100.2	101.2	100.4	102.0	93.2	90.4	50.9	39.5	...	...
Girls, 6-11 years	98.2	90.9	98.5	84.7	99.0	98.5	99.0	98.8	101.4	100.3	102.1	102.7	49.1	60.5	...	...
	Standard error of mean															
Total, 6-11 years	0.55	2.06	0.74	2.08	0.47	2.23	0.55	1.99	0.63	1.93	0.50	2.56	...	...	...	...
6 years	0.65	5.59	0.71	11.26	0.72	0.90	0.60	4.60	0.74	4.07	0.64	5.44	...	...	...	...
7 years	0.64	6.43	0.79	8.36	0.64	4.59	0.72	2.34	0.93	3.98	0.67	2.30	...	...	...	...
8 years	0.51	7.82	0.76	6.47	0.43	13.12	0.63	2.99	0.91	2.41	0.72	6.08	...	...	...	...
9 years	0.67	3.82	0.87	6.97	0.61	5.01	0.61	2.31	0.94	2.34	0.72	3.82	...	...	...	...
10 years	0.77	5.22	1.04	3.88	0.71	7.85	0.70	3.86	0.87	4.81	0.77	5.93	...	...	...	...
11 years	0.61	50.16	0.73	53.92	0.67	47.54	0.94	2.91	1.09	4.08	1.08	4.45	...	...	...	...
Boys, 6-11 years	0.63	2.78	0.83	3.33	0.53	3.43	0.63	1.23	0.63	1.11	0.82	3.65	...	...	...	...
Girls, 6-11 years	0.53	3.25	0.69	4.15	0.50	2.49	0.58	3.26	0.93	6.80	0.51	2.79	...	...	...	...

[1] Birthplace of mother (2d parent).

Table 4. Mean deviation IQ and standard error of the mean on the short form of the Wechsler Intelligence Scale for Children (WISC) and the modified Goodenough-Harris Human Figure Drawing (HFD) tests for and percent distribution of children 6-11 years of age, by age of mother and of father at the time of the child's birth: United States, 1963-1965

Age of parent at birth of child	WISC			HFD			WISC Combined	HFD Combined	Percent of children
	Combined	Vocabulary	Block Design	Combined	Man Scale	Woman Scale			
Mother	Mean deviation IQ						Standard error of mean		
10-19 years	94.9	95.0	96.1	97.9	98.3	99.1	0.50	0.50	11.0
20-24 years	99.0	99.4	99.9	99.5	100.8	99.7	0.65	0.55	30.8
25-29 years	101.0	101.6	101.6	100.2	100.7	101.6	0.60	0.64	27.3
30-34 years	100.7	101.9	100.7	100.4	101.3	101.7	0.73	0.58	19.0
35-39 years	101.1	102.4	101.0	100.6	101.7	101.4	0.92	0.96	9.2
40-44 years	97.8	97.9	99.0	97.6	98.5	98.5	1.64	1.24	2.5
45-54 years	90.3	88.7	93.2	91.4	96.3	86.2	4.20	4.30	0.2
Father									
15-19 years	96.2	97.6	96.0	99.2	100.3	99.6	0.79	0.86	2.5
20-24 years	98.4	98.8	99.4	99.4	100.7	99.7	0.54	0.56	20.6
25-29 years	100.8	101.3	101.5	100.4	101.1	101.4	0.63	0.43	29.3
30-34 years	101.0	101.8	101.4	100.2	101.3	101.2	0.74	0.65	23.1
35-39 years	99.8	101.1	99.7	100.6	101.0	102.2	0.74	0.77	14.0
40-44 years	100.0	100.7	100.6	99.0	100.1	100.1	0.96	1.08	6.7
45-49 years	95.5	95.6	96.7	96.8	97.1	98.4	1.33	1.51	2.4
50 years and over	92.3	93.4	94.2	94.8	96.3	95.0	1.90	3.00	1.4

Table 5. Mean deviation IQ and standard error of the mean on the short form of the Wechsler Intelligence Scale for Children (WISC) and the modified Goodenough-Harris Human Figure Drawing (HFD) tests for and number and percent distribution of children 6-11 years of age, by number of children under 20 years in the household and sex of child: United States, 1963-1965

Number of children under 20 years in household	WISC			HFD			WISC Combined*		HFD Combined		Number in thousands			Percent		
	Combined	Vocabulary	Block Design	Combined	Man Scale	Woman Scale	Boys	Girls	Boys	Girls	Both sexes	Boys	Girls	Both sexes	Boys	Girls
	Mean deviation IQ															
1 child	101.6	104.1	100.4	99.6	100.5	99.8	103.9	99.1	101.0	98.0	1,261	664	597	5.3	5.5	5.1
2 children	103.0	105.4	101.8	100.5	102.3	100.4	104.9	101.0	101.9	99.0	4,425	2,259	2,166	18.6	18.7	18.6
3 children	102.1	103.4	102.1	101.5	101.9	103.1	102.8	101.3	101.3	101.8	5,756	2,984	2,772	24.2	24.7	23.9
4 children	99.8	100.2	100.5	99.7	100.8	100.5	100.7	98.7	100.1	99.4	4,804	2,513	2,291	20.2	20.8	19.5
5 children	97.0	96.2	99.1	99.3	100.0	100.6	98.6	95.6	99.8	98.8	2,997	1,474	1,523	12.6	12.2	13.0
6 children	94.7	93.7	96.9	98.0	99.5	98.1	96.6	92.8	99.9	96.0	1,831	906	925	7.7	7.5	7.9
7 children	92.7	91.4	95.2	96.4	96.8	98.1	93.4	92.0	96.9	95.9	1,189	568	621	5.0	4.7	5.2
8 children or more	90.5	88.4	93.7	93.6	93.7	96.2	90.2	90.8	93.1	94.2	1,522	713	809	6.4	5.9	6.8
	Standard error of mean															
1 child	0.82	0.94	0.92	0.78	0.86	1.32	0.94	1.06	1.11	1.24	---	---	---	---	---	---
2 children	0.58	0.74	0.62	0.50	0.75	0.38	0.72	0.61	0.74	0.58	---	---	---	---	---	---
3 children	0.43	0.55	0.49	0.50	0.61	0.73	0.59	0.56	0.62	0.76	---	---	---	---	---	---
4 children	0.59	0.75	0.56	0.56	0.65	0.71	0.72	0.66	0.73	0.72	---	---	---	---	---	---
5 children	0.92	0.96	0.97	1.00	1.23	0.98	1.30	0.81	1.41	0.91	---	---	---	---	---	---
6 children	0.96	1.08	1.05	0.91	1.58	0.91	0.92	1.34	1.36	1.02	---	---	---	---	---	---
7 children	1.27	1.39	1.44	1.21	1.46	1.73	1.80	1.30	1.53	1.73	---	---	---	---	---	---
8 children or more	1.12	1.24	1.25	1.06	1.52	1.32	1.36	1.32	1.45	1.38	---	---	---	---	---	---

Table 6. Mean deviation IQ and standard error of the mean on the WISC Vocabulary and Block Design and the modified HFD tests for and percent of children 6-11 years of age, by educational attainment of first parent and number of children under 20 years in the household: United States, 1963-1965

Number of children under 20 years in household	Education of first parent															
	Less than 5 years			5-8 years			9-12 years			13 years or more			Less than 5 years	5-8 years	9-12 years	13 years or more
	WISC		HFD	WISC		HFD	WISC		HFD	WISC		HFD				
	Vocabulary	Block Design		Vocabulary	Block Design		Vocabulary	Block Design		Vocabulary	Block Design					
	Mean deviation IQ												Percent			
1 child	94.0	90.2	90.6	100.0	99.3	99.4	106.0	100.7	99.8	110.2	106.2	103.6	4.7	6.4	5.5	3.7
2 children	89.5	92.3	89.5	95.8	96.2	96.7	104.9	101.1	100.3	113.3	107.3	104.1	7.4	14.7	19.3	25.6
3 children	85.4	91.2	92.8	97.4	96.6	99.9	102.8	101.8	100.7	110.5	107.5	105.3	9.4	19.2	26.4	29.8
4 children	86.3	90.7	93.5	94.4	95.6	95.2	100.7	100.6	100.0	108.8	108.2	105.0	15.7	18.7	21.9	19.4
5 children	83.0	89.5	90.3	91.8	95.0	96.2	97.6	100.8	100.9	105.6	105.7	105.1	19.2	13.7	11.4	11.8
6 children	83.0	89.5	93.0	90.8	93.4	96.8	94.9	98.4	98.7	104.4	106.3	102.6	12.2	10.2	6.8	5.2
7 children	81.6	87.7	90.1	87.7	93.3	95.3	95.2	98.2	97.9	105.8	104.0	105.3	11.7	8.0	3.8	2.2
8 children or more	79.1	87.4	85.9	87.0	92.8	94.5	92.6	96.7	97.9	101.7	102.9	97.5	19.7	9.1	4.9	2.3
	Standard error of mean															
1 child	6.60	1.77	4.19	0.97	1.29	1.66	0.80	0.95	1.01	2.59	2.85	1.97	---	---	---	---
2 children	3.84	2.63	2.44	1.17	0.71	1.00	0.55	0.54	0.55	0.85	1.15	0.65	---	---	---	---
3 children	2.18	1.36	2.15	0.96	1.08	1.20	0.61	0.71	0.75	0.70	0.71	0.92	---	---	---	---
4 children	1.46	0.81	1.44	1.10	1.08	1.17	0.68	0.51	0.74	1.11	1.28	0.84	---	---	---	---
5 children	2.24	1.41	2.19	1.36	1.34	1.41	0.77	0.84	0.92	1.14	2.78	1.77	---	---	---	---
6 children	2.60	1.08	1.55	1.29	1.23	1.74	1.29	1.11	1.35	2.85	2.94	2.16	---	---	---	---
7 children	3.04	1.43	2.54	1.69	1.44	1.27	1.75	1.83	1.55	2.71	4.57	5.62	---	---	---	---
8 children or more	2.80	1.20	2.00	1.50	1.30	1.50	1.50	1.50	1.40	2.80	3.70	3.90	---	---	---	---

Table 7. Mean deviation IQ and standard error of the mean on the short form of the Wechsler Intelligence Scale for Children (WISC) and the modified Goodenough-Harris Human Figure Drawing (HFD) tests for and percent distribution of children 6-11 years of age, by number of deceased siblings (born dead or who died later): United States, 1963-1965

Number of deceased siblings	WISC Combined	WISC Vocabulary	WISC Block Design	HFD	WISC Combined	WISC Vocabulary	WISC Block Design	HFD	Percent of children
	Mean deviation IQ				Standard error of mean				
Born dead									
None	99.6	100.2	100.1	99.7	0.60	0.80	0.50	0.60	93.9
1 sibling	97.3	98.0	97.7	98.6	0.74	0.96	0.77	0.72	4.4
2 siblings	99.4	98.2	101.9	98.1	2.99	2.50	3.68	2.90	1.1
3 siblings	97.8	97.5	98.9	99.0	*	*	*	*	0.3
4 siblings	86.2	86.6	87.4	88.4	*	*	*	*	0.2
5 siblings or more	96.6	95.6	98.3	92.6	*	*	*	*	0.1
Liveborn but died before survey									
None	99.9	100.5	100.4	99.9	0.58	0.77	0.50	0.51	92.6
1 sibling	95.2	95.5	96.0	96.6	0.82	1.19	0.74	1.04	5.8
2 siblings	91.7	91.8	92.7	93.9	1.82	3.00	0.88	1.79	1.1
3 siblings	84.8	81.8	89.0	83.3	3.49	5.75	2.28	6.21	0.3
4 siblings	92.1	94.5	90.8	90.9	*	*	*	*	0.1
5 siblings or more	87.6	87.6	88.6	98.2	*	*	*	*	0.1

Table 8. Mean deviation IQ and standard error of the mean on the short form of the Wechsler Intelligence Scale for Children (WISC) and the modified Goodenough-Harris Human Figure Drawing (HFD) tests for and number and percent distribution of children 6-11 years, by age order of the child in the family: United States, 1963-1965

Age order of child in family	WISC Combined	WISC Vocabulary	WISC Block Design	HFD Combined	HFD Man Scale	HFD Woman Scale	WISC Combined Boys	WISC Combined Girls	HFD Combined Boys	HFD Combined Girls	Number of children in thousands	Percent of children
	Mean deviation IQ											
First	101.2	102.9	100.8	100.3	101.4	100.8	103.0	99.3	101.2	99.3	6,897	29.0
Second	100.5	101.5	100.8	100.2	101.3	100.8	101.9	99.1	100.8	99.5	6,969	29.3
Third	99.4	99.3	100.7	99.8	100.6	100.9	100.3	98.5	100.2	99.5	5,114	21.5
Fourth	96.5	96.1	98.1	97.9	98.9	99.3	97.3	95.7	98.2	97.6	2,664	11.2
Fifth	93.8	92.3	96.5	96.7	96.6	98.8	93.8	93.7	96.1	97.2	1,142	4.8
Sixth or later	92.1	91.3	94.1	96.2	96.0	99.4	92.1	92.1	96.4	96.0	999	4.2
	Standard error of mean											
First	0.60	0.78	0.53	0.46	0.65	0.57	0.71	0.64	0.62	0.61	---	---
Second	0.52	0.71	0.45	0.56	0.72	0.47	0.61	0.57	0.73	0.56	---	---
Third	0.62	0.77	0.62	0.58	0.73	0.71	0.87	0.60	0.81	0.74	---	---
Fourth	0.87	1.07	0.92	0.98	1.36	0.70	1.22	0.81	1.35	0.86	---	---
Fifth	1.28	1.46	1.18	1.23	1.84	1.30	1.71	1.19	1.90	1.48	---	---
Sixth or later	1.10	1.50	1.00	1.50	1.60	1.80	1.20	1.20	1.70	1.60	---	---

Table 9. Mean deviation IQ and standard error of the mean on the WISC Vocabulary and Block Design tests for children 6-11 years of age, by age order of child in family and number of children under 20 years in the household: United States, 1963-1965

Age order of child in family	WISC Vocabulary						WISC Block Design					
	Number of persons under 20 years in household						Number of persons under 20 years in household					
	1	2	3	4	5	6 or more	1	2	3	4	5	6 or more
	Mean deviation IQ											
First	104.1	106.0	103.9	99.1	98.1	89.4	100.4	102.0	101.6	99.8	100.5	92.5
Second	-	104.9	103.3	100.4	95.5	90.1	-	101.7	102.3	101.0	97.6	94.5
Third	-	-	103.1	100.3	95.8	92.5	-	-	102.2	100.6	100.2	97.9
Fourth	-	-	-	100.9	96.3	91.5	-	-	-	100.6	98.4	95.6
Fifth	-	-	-	-	95.6	91.2	-	-	-	-	98.8	95.7
Sixth or later	-	-	-	-	-	91.3	-	-	-	-	-	94.1
	Standard error of mean											
First	0.94	0.97	0.70	0.96	1.62	1.93	0.92	0.66	0.98	1.06	2.07	1.61
Second	-	0.73	0.75	0.96	1.04	1.95	---	0.80	0.57	0.86	0.97	1.40
Third	-	-	0.80	0.93	0.80	1.30	---	---	0.68	0.84	1.23	1.66
Fourth	-	-	-	0.99	1.30	1.22	---	---	---	1.15	1.23	0.96
Fifth	-	-	-	-	2.95	1.27	---	---	---	---	2.48	1.19
Sixth or later	-	-	-	-	-	1.56	---	---	---	---	---	1.01

Table 10. Mean deviation IQ and standard error of the mean by age order of child in family and education of second parent on the modified HFD test and by age order of child in family and education of first parent on the WISC Vocabulary and Block Design tests: United States, 1963-1965

Age order of child in family	HFD				WISC Vocabulary				WISC Block Design			
	Education of second parent				Education of first parent				Education of first parent			
	Under 5 years	5-8 years	9-12 years	13 years or more	Under 5 years	5-8 years	9-12 years	13 years or more	Under 5 years	5-8 years	9-12 years	13 years or more
	Mean deviation IQ											
First	95.2	95.6	100.8	103.5	88.2	95.5	102.8	111.5	91.0	96.6	100.6	106.6
Second	89.1	97.8	100.6	103.2	84.4	94.0	101.6	110.7	90.0	94.7	101.2	107.1
Third	89.0	95.5	101.0	104.1	84.0	94.1	100.3	107.8	89.7	96.9	100.6	108.6
Fourth	88.1	95.0	99.0	105.5	81.6	90.6	99.1	106.8	88.1	93.2	100.4	106.3
Fifth	86.6	95.5	99.6	106.9	81.9	91.7	96.1	103.2	88.7	95.5	99.0	107.6
Sixth or later	90.9	99.5	98.3	95.6	81.7	92.2	94.2	99.8	88.9	92.6	97.6	98.0
	Standard error of mean											
First	1.62	0.94	0.43	0.96	1.64	0.99	0.66	0.78	1.11	0.84	0.45	1.10
Second	1.93	1.20	0.67	0.53	2.31	0.97	0.49	0.67	0.90	1.00	0.43	0.86
Third	2.12	0.92	0.59	1.11	2.15	1.09	0.60	0.70	1.41	1.04	0.48	1.06
Fourth	3.48	1.16	1.11	1.53	2.82	0.85	0.70	0.82	0.89	1.06	0.87	1.67
Fifth	3.53	2.08	0.96	3.85	1.59	1.63	1.08	1.85	1.25	1.65	1.10	3.32
Sixth or later	5.54	3.18	2.90	5.95	2.07	1.35	1.90	22.84	2.42	1.42	1.61	22.09

Table 11. Mean deviation IQ and standard error of the mean on the short form of the Wechsler Intelligence Scale for Children (WISC) and the modified Goodenough-Harris Human Figure Drawing (HFD) tests for children 6-11 years of age, by presence or absence of medical complications of mother during pregnancy and by education of the second parent on the WISC: United States, 1963-1965

Item	Medical complications of mother during pregnancy			
	Some	None	Some	None
WISC	Mean deviation IQ		Standard error of mean	
Combined	100.1	99.9	0.86	0.65
Vocabulary	101.6	100.6	1.08	0.86
Block Design	100.0	100.4	0.99	0.63
HFD				
Combined	99.6	99.6	0.84	0.48
Man Scale	100.8	100.5	1.09	0.59
Woman Scale	100.6	100.5	0.70	0.42
WISC Combined				
Education of second parent:				
Less than 5 years	92.1	85.2	3.72	1.40
5-8 years	92.4	92.5	1.44	0.72
9-12 years	100.6	101.0	0.71	0.31
13 years or more	108.0	108.3	1.38	0.82

Table 12. Mean deviation IQ and standard error of the mean on the short form of the Wechsler Intelligence Scale for Children (WISC) and the modified Goodenough-Harris Human Figure Drawing (HFD) tests for and number and percent distribution of children 6-11 years of age, by birthweight, length of baby's stay in hospital after birth, congenital malformations and birth injuries shown on birth certificate, handedness, and twin status: United States, 1963-1965

Item	WISC			HFD			WISC	HFD	Number of children in thousands	Percent of children
	Combined	Vocabulary	Block Design	Combined	Man Scale	Woman Scale	Combined	Combined		
	Mean deviation IQ						Standard error of mean			
Birthweight										
Under 5 pounds	94.6	95.5	95.0	96.0	96.3	97.5	0.66	1.29	690	2.9
5-10 pounds	99.6	100.2	100.2	99.7	100.5	100.9	0.63	0.56	22,785	95.8
More than 10 pounds	95.6	95.3	97.1	98.0	97.4	97.7	1.51	1.43	309	1.3
Length of baby's stay in hospital after birth										
Under 1 week	100.4	101.2	100.9	100.3	101.2	101.3	0.44	0.41	21,210	89.6
1-2 weeks	101.7	102.9	101.9	100.5	100.6	102.0	0.99	0.98	1,760	7.4
Over 2 weeks	95.8	96.7	96.2	96.0	98.0	96.0	0.72	1.27	714	3.0
Congenital malformation										
Condition recorded on birth certificate	97.6	97.6	98.6	100.0	100.9	99.6	2.09	3.06	238	1.0
None recorded	100.1	100.8	100.6	99.7	-	100.9	0.52	0.68	23,546	99.0
Birth injury										
Condition recorded on birth certificate	93.1	91.4	95.8	99.4	107.0	96.1	5.90	3.96	71	0.3
None recorded	99.6	100.4	100.1	99.1	99.9	100.3	0.68	0.80	23,713	99.7
Handedness										
Right	99.0	99.6	99.7	99.5	100.4	100.4	0.67	0.53	21,215	89.2
Left	99.1	100.3	99.2	99.2	99.9	100.0	0.62	0.55	2,545	10.7
Ambidextrous	90.6	89.6	92.4	92.5	97.1	75.0	21.96	22.97	24	0.1
Twin status										
Not a twin	99.4	100.0	100.0	99.6	100.6	100.5	0.61	0.50	23,332	98.1
Identical twin	98.4	98.0	100.2	96.8	92.6	100.9	2.36	2.33	143	0.6
Fraternal twin	96.0	96.4	96.8	97.4	95.7	100.7	1.65	2.76	285	1.2
Twin, type unknown	86.1	85.6	87.8	86.6	84.1	91.2	4.06	2.58	24	0.1

Table 13. Mean deviation IQ and standard error of the mean on the short form of the Wechsler Intelligence Scale for Children (WISC) and the modified Goodenough-Harris Human Figure Drawing (HFD) tests for and percent distribution of children 6-11 years of age, by critical aspects of early developmental history: United States, 1963-1965

Early developmental history	Boys and girls Combined		Boys and girls Combined		Boys Combined		Girls Combined		Boys and girls				Percent of children
	WISC	HFD	WISC	HFD	WISC	HFD	WISC	HFD	Vocab-ulary	Block Design	Man Scale	Woman Scale	
	Mean deviation IQ		Standard error		Mean deviation IQ								
Acceptance of change from breast feeding													
No problem	100.2	100.6	0.83	0.76	101.8	101.5	98.6	99.7	100.6	101.1	101.9	101.2	90.5
Some problem	96.6	98.5	1.47	1.62	97.0	98.0	96.4	98.9	98.1	96.4	97.8	100.4	7.9
Considerable problem	98.2	98.9	2.33	3.10	100.7	101.6	96.1	96.6	101.0	96.5	99.2	100.3	1.6
Age child first walked													
Under 12 months	100.0	100.3	0.66	0.61	101.5	101.4	98.5	99.2	100.8	100.4	101.8	100.8	47.7
12-18 months	99.6	99.6	0.56	0.47	100.9	99.9	98.2	99.4	100.2	100.3	100.2	101.0	47.3
Over 18 months	89.9	90.6	1.19	1.37	90.3	90.8	89.4	90.4	88.4	92.4	90.8	92.3	3.6
Don't know	94.6	94.0	1.67	1.48	93.5	93.3	95.5	94.6	94.8	95.5	94.1	96.2	1.4
Age child first spoke													
Under 12 months	101.0	101.1	0.59	0.54	102.6	101.9	99.5	100.4	102.0	101.1	102.1	102.1	42.8
12-18 months	99.2	99.2	0.59	0.57	100.7	100.0	97.4	98.4	99.6	100.0	100.3	99.9	41.1
Over 18 months	94.4	94.6	1.19	1.20	96.3	95.7	91.6	93.0	94.1	95.9	95.8	94.8	8.5
Don't know	96.9	98.1	0.67	0.80	96.2	97.9	97.6	98.3	97.0	98.0	99.0	99.0	7.6
Problems with talking													
Some	95.0	96.0	0.86	0.86	96.6	96.5	92.7	95.2	93.8	97.5	96.3	97.0	8.4
None	99.8	99.9	0.60	0.49	101.1	100.6	98.4	99.2	100.5	100.2	100.9	100.8	91.6
Don't know	*	*	*	*	*	*	*	*	*	*	*	*	*
Learning speed													
Faster	102.9	102.1	0.88	0.75	105.6	103.9	100.9	100.8	104.4	102.8	103.8	103.0	20.2
Average	99.0	99.4	0.51	0.46	100.4	99.9	97.5	98.8	99.5	99.7	100.3	100.2	74.9
Slower	89.2	90.6	1.23	1.49	90.2	92.2	87.2	87.4	87.0	92.4	92.1	89.1	4.2
Don't know	95.4	98.4	1.83	2.08	93.8	98.4	97.4	98.5	94.8	97.0	97.5	103.2	0.7
Health at 1 year													
Good	99.7	99.9	0.63	0.51	101.0	100.4	98.4	99.3	100.4	100.3	100.8	100.9	90.9
Fair	97.0	97.8	0.74	0.76	98.9	99.0	94.6	96.3	97.1	98.1	98.5	97.8	7.6
Poor	92.7	92.7	1.06	2.15	95.2	93.1	90.1	92.2	92.3	94.1	94.8	92.7	1.7

Table 14. Mean deviation IQ and standard error of the mean on the short form of the Wechsler Intelligence Scale for Children (WISC) and the modified Goodenough-Harris Human Figure Drawing (HFD) tests for and percent of children 6-11 years of age, by findings of congenital and acquired chronic conditions on survey examination: United States, 1963-1965

Item	Boys and girls				Boys Combined		Girls Combined		Boys and girls				Percent of children
	Combined		Combined										
	WISC	HFD	WISC	HFD	WISC	HFD	WISC	HFD	Vocabulary	Block Design	Man Scale	Woman Scale	
Medical history of	Mean deviation IQ		Standard error		Mean deviation IQ								
Epilepsy	94.7	91.9	2.79	3.93	98.8	96.4	91.8	88.7	93.4	97.2	93.8	92.1	0.3
Cerebral palsy	83.6	78.7	3.20	6.63	87.2	85.2	80.0	72.2	83.2	84.8	81.8	77.2	0.1
Present health findings on examination													
Heart condition:													
Congenital	94.7	95.1	2.23	1.64	96.5	94.8	92.4	95.5	93.6	97.0	95.5	96.5	1.9
Acquired	96.7	97.1	2.60	1.59	102.2	98.1	89.7	95.8	96.9	97.8	99.5	96.6	0.7
None	99.7	99.9	0.62	0.52	101.1	100.6	98.4	99.2	100.4	100.3	100.9	100.9	97.4
Neurological-musculoskeletal condition:													
None	99.7	99.9	0.62	0.52	101.1	100.6	98.4	99.2	100.4	100.3	100.9	100.9	96.4
Congenital	94.1	91.6	1.32	1.70	96.4	94.5	91.4	88.3	93.5	95.9	96.0	88.4	1.9
Acquired	96.1	94.8	2.54	2.27	94.6	94.4	98.1	95.3	96.5	96.8	94.3	97.4	1.7
Cerebral palsy, other cerebral problems or minimal cerebral dysfunction	89.9	---	2.31	---	92.0	---	81.8	---	90.1	90.9	---	---	0.5
Mongolism or mental retardation	76.8	---	4.35	---	79.2	---	73.6	---	67.2	87.3	---	---	0.3
Eye disorders	96.9	---	2.99	---	100.8	---	94.2	---	96.9	98.4	---	---	0.6
Musculoskeletal joint disorders only	99.2	---	1.61	---	99.7	---	98.4	---	100.5	99.1	---	---	2.2

Table 15. Mean deviation IQ and standard error of the mean on the WISC Vocabulary and Block Design and the modified HFD tests for children 6-11 years of age, by race, kindergarten or nursery school experience, and educational attainment of first parent: United States, 1963-1965

Education of first parent	Child attended kindergarten or nursery school						Child did not attend kindergarten or nursery school					
	WISC Vocabulary		WISC Block Design		HFD		WISC Vocabulary		WISC Block Design		HFD	
	White	Negro	White	Negro	White	Negro	White	Negro	White	Negro	White	Negro
	Mean deviation IQ											
All children	104.3	90.1	103.4	91.6	101.7	96.9	96.3	85.0	97.4	88.1	97.5	91.0
Less than 5 years	87.3	84.1	92.3	88.6	91.5	91.0	83.2	82.4	90.1	85.4	91.5	85.4
5-8 years	99.0	87.2	99.1	90.4	98.9	95.5	92.6	83.7	94.6	88.6	96.3	92.2
9-12 years	103.0	91.6	102.4	92.3	101.0	98.1	100.7	89.0	100.4	89.3	99.0	93.3
13 years or more	110.6	99.1	108.2	95.6	105.1	101.6	107.4	93.5	103.1	91.8	102.2	97.8
	Standard error of mean											
All children	0.70	1.09	0.54	0.27	0.54	0.74	1.53	2.28	0.77	0.96	0.88	1.20
Less than 5 years	2.69	2.84	1.67	1.32	2.78	1.45	2.26	1.65	0.57	0.87	1.04	1.84
5-8 years	0.83	1.05	0.84	0.38	1.06	1.68	0.87	3.02	1.02	0.94	1.05	1.59
9-12 years	0.55	1.17	0.44	0.54	0.50	0.71	0.90	2.26	0.48	0.89	0.79	1.77
13 years or more	0.70	2.08	0.78	2.38	0.57	2.48	1.03	7.66	1.02	2.66	1.10	4.98

APPENDIX I

STATISTICAL NOTES

The Survey Design

The sample design for the second cycle of the Health Examination Survey, similar to the one used for the first cycle, was that of a multistage, stratified probability sample of loose clusters of persons in land-based segments. Successive elements dealt with in the process of sampling are primary sampling unit (PSU), census enumeration district (ED), segment, household, eligible child (EC), and finally, the sample child (SC).

At the first stage, the nearly 2,000 PSU's into which the United States (including Hawaii and Alaska) has been divided and then grouped into 357 strata for use in the Current Population Survey and the Health Interview Survey were further grouped into 40 superstrata for use in Cycle II of the Health Examination Survey. The average size of each Cycle II stratum was 4.5 million persons, and all fell between the limits of 3.5 and 5.5 million. Grouping into 40 strata was done in a way that maximized homogeneity of the PSU's included in each stratum, particularly with regard to degree of urbanization, geographic proximity, and degree of industrialization. The 40 strata were classified into four broad geographic regions (each with 10 strata) of approximately equal population and cross classified into four broad population density groups (each having 10 strata). Each of the 16 cells contained either two or three strata. A single stratum might include only one PSU (or only part of a PSU as, for example, New York City, which represented two strata) or several score PSU's.

To take account of the possible effect that the rate of population change between the 1950 and 1960 census might have had on health, the 10 strata within each region were further classified into four classes, ranging from those with no increase to those with the greatest relative increase. Each such class contained either two or three strata.

One PSU was then selected from each of the 40 strata. A controlled selection technique was used in which the probability of selection of a particular PSU was proportional to its 1960 population. In the controlled selection an attempt was also made to maximize the spread of the PSU's among the States. While not every one of the 64 cells in the 4 X 4 X 4 grid contributes a PSU to the sample of 40 PSU's, the controlled selection technique ensured the sample's matching the marginal distributions in all three dimensions and being closely representative of all cross classifications.

Generally, 20 ED's were selected within a particular PSU. The probability of selection of a particular ED was proportional to its population in the age group 5-9 years in the 1960 census, which by 1963 roughly approximated the population in the target age group for Cycle II. A similar method was used for selecting one segment (cluster of households) in each ED. Each of the resultant 20 segments was either a bounded area or a cluster of households (or addresses). All children in the age range 6-11 years normally resident at each household or address were considered EC's. Operational considerations made it necessary to reduce the number of prospective examinees at any one location to a maximum of 200. The EC's to be excluded for this reason from the SC group were determined by systematic subsampling.

The total sample thus selected for the examination included 7,417 children (SC's) from 25 different States in the age group 6-11 years, with approximately 1,000 at each of the single years of age.

Reliability

Measurement and assessment processes employed in the survey were highly standardized and closely controlled. Of course this does not mean that the correspondence between the real world and the survey results is exact. Data from the survey are imperfect for three major reasons: (1) results are subject to sampling error, (2) the actual conduct of a survey never agrees perfectly with the design, and (3) the measurement or assessment processes themselves are inexact even though standardized and controlled.

The first report on Cycle II[4] describes in detail the faithfulness with which the sampling design was carried out. It notes that 7,119 out of the 7,417 sample children were examined. This is a response rate of 96 percent. The examined children were a highly representative sample of children of this age in the noninstitutional population of the United States. The response levels for the various demographic subgroups—including those for age, sex, race, region, population density, parent's educational level, and family income—show no marked differentials. Hence it appears unlikely that nonresponse could have biased the findings markedly in these respects. Further description of the sample design and estimation procedures is contained in a subsequent report.[73]

The general measures used to control the quality of data from this survey have been cited previously.[4] as have those relating specifically to the psychological test measures.[6,9]

Data recorded for each sample child are inflated in the estimation process to characterize the larger universe of which the sample child is representative. The weights used in this inflation process are a product of the reciprocal of the probability of selecting the child, an adjustment for nonresponse cases, and a poststratified ratio adjustment that increases precision by bringing survey results into closer alinement with known U.S. population figures by color and sex for single years of age 6 through 11.

In the second cycle of the Health Examination Survey, the sample was the result of three stages of selection—the single PSU from each stratum, the 20 segments from each sample PSU, and the SC's from the EC's. The probability of selecting an individual child is the product of the probability of selection at each stage.

Since the strata are roughly equal in population size and a nearly equal number of sample children were examined in each sample PSU, the sample design is essentially self-weighting with respect to the target population; that is, each child 6 through 11 years had about the same probability of being drawn into the sample.

The adjustment upward for nonresponse is intended to minimize the impact of nonresponse on final estimates by imputing to nonrespondents the characteristics of "similar" respondents. Here similar respondents were judged to be examined children in a sample PSU having the same age in years and sex as children not examined in that sample PSU.

The poststratified ratio adjustment used in the second cycle achieved most of the gains in precision that would have been attained if the sample had been drawn from a population stratified by age, color, and sex and made the final sample estimates of population agree exactly with independent controls prepared by the Bureau of the Census for the noninstitutional U.S. population as of August 1, 1964 (approximate midsurvey point), by color and sex for each single year of age 6 through 11. The weight of every responding sample child in each of the 24 age, color, and sex classes is adjusted upward or downward so that the weighted total within the class equals the independent population control.

Sampling and Measurement Error

In the present report, reference has been made to efforts to minimize bias and variability of measurement techniques.

The probability design of the survey makes possible the calculation of sampling errors. The sampling error is used here to determine how imprecise the survey test results may be because they come from a sample rather than from the measurements of all elements in the universe.

The estimation of sampling errors for a study of the type of the Health Examination Survey is difficult for at least three reasons: (1) Measurement error and "pure" sampling error are confounded in the data—it is not easy to find a procedure which will either completely include both or treat one or the other separately, (2) the survey design and estimation procedure are complex and accordingly require computationally involved techniques for the calculation of variances, and (3) thousands of statistics come from the survey, many for subclasses of the population for which there are few cases. Estimates of sampling error are obtained from the sample data and are themselves subject to sampling error, which may be large when the number of cases in a cell is small or occasionally even when the number of cases is substantial.

Estimates of approximate sampling variability for selected statistics used in this report are presented in the detailed tables. These estimates have been prepared by a replication technique that yields overall variability through observation of variability among random subsamples of the total sample. The method reflects both "pure" sampling variance and a part of the measurement variance.

In accordance with usual practice, the interval estimate for any statistic may be considered the range within one standard error of the tabulated statistic, with 68-percent confidence, or the range within two standard errors of the tabulated statistic, with 95-percent confidence. The latter is used as the level of significance in this report.

An approximation of the standard error of a difference $d = x - y$ of two statistics x and y is given by the formula

$$S_d = (S_x^2 + S_y^2)^{1/2}$$

where S_x and S_y are the sampling errors, respectively, of x and y.

Small Categories

In some tables magnitudes are shown for cells for which the sample size is so small that the sampling error may be several times as great as the statistic itself. Obviously in such instances the statistic has no meaning in itself except to indicate that the true quantity is small. Such numbers, if shown, have been included in the belief that they may help to convey an impression of the overall story of the table.

APPENDIX II

DEMOGRAPHIC AND SOCIOECONOMIC TERMS

Age.—The age recorded for each child was the age at last birthday on the date of examination. The age criterion for inclusion in the sample used in this survey was defined in terms of age at time of interview. Since the examination usually took place 2 to 4 weeks after the interview, some of those who were 11 years old at the time of interview became 12 years old by the time of examination. There were 72 such cases. In the adjustment and weighting procedures used to produce national estimates, these 72 were included in the 11-year-old group.

Race.—The age order of the child is their relative ranking by date of birth. Race was recorded as "white," "Negro," or "other." "Other" included American Indians, Chinese, Japanese, and all races other than white or Negro. Mexican persons were included with "white" unless definitely known to be American Indian or of another race. Negroes and persons of mixed Negro and other parentage were recorded as "Negro."

Geographic region.—For purposes of stratification the United States was divided into four geographic regions of approximately equal population. These regions, which correspond closely to those used by the U.S. Bureau of the Census, were as follows:

Region	*States included*
Northeast . . .	Maine, Vermont, New Hampshire, Massachusetts, Connecticut, Rhode Island, New York, New Jersey, and Pennsylvania
Midwest	Ohio, Illinois, Indiana, Michigan, Wisconsin, Minnesota, Iowa, and Missouri
South	Delaware, Maryland, District of Columbia, West Virginia, Virginia, Kentucky, Tennessee, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, and Arkansas
West	Washington, Oregon, California, Nevada, New Mexico, Arizona, Texas, Oklahoma, Kansas, Nebraska, North Dakota, South Dakota, Idaho, Utah, Colorado, Montana, Wyoming, Alaska, and Hawaii

Urban and rural.—The definition of urban and rural areas was the same as that used in the 1960 census. According to this definition, the urban population was comprised of all persons living in (a) places of 2,500 inhabitants or more incorporated as cities, boroughs, villages, and towns (except towns in New England, New York, and Wisconsin); (b) the densely settled urban fringe, whether incorporated or unincorporated, of urbanized areas; (c) towns in New England and townships in New Jersey and Pennsylvania that contained no incorporated municipalities as subdivisions and had either 2,500 inhabitants or more, or a population of 2,500 to 25,000 and a density of 1,500 persons or more per square mile; (d) counties in States other than the New England States, New Jersey, and Pennsylvania that had no incorporated municipalities within their boundaries and had a density of 1,500 persons or more per square mile; and (e) unincorporated places of 2,500 inhabitants or more not included in any urban fringe. The remaining population was classified as rural.

Urban areas are further classified by population size for places within urbanized areas and other urban places outside urbanized areas.

Family income.—The income recorded was the total income of the past 12 months received by the head of the household and all other household members related to the head by blood, marriage, or adoption. This income was the gross cash income (excluding pay in kind) except in the case of a family with their own farm or business, in which case net income was recorded.

Parent.—A parent was the natural parent or, in the case of adoption, the legal parent of the child. When both parents were present in the household, the mother is referred to here as the second parent.

Guardian.—A guardian was the person responsible for the care and supervision of the child. He (or she) did not have to be the legal guardian to be considered the guardian for this survey. A guardianship could only exist when the parent(s) of the child did not reside within the sample household.

Head of household.—Only one person in each household was designated as the "head." He (or she) was the person who was regarded as the "head" by the members of the household. In most cases, the head was the chief breadwinner of the family, although this was not always true. In this report the head of household is also referred to as the first parent.

Education of parent or guardian.—This was recorded as the highest grade completed in school. The only grades counted were those attended in a regular school where parents were given formal education in graded public or private schools, whether day or night school, and whether attendance was full or part time. A "regular" school is one which advances a person toward an elementary or high school diploma, or a college, university, or professional school degree. Education in vocational, trade, or business schools outside the regular school system was not counted in determining the highest grade of school completed.

APPENDIX III

HOUSEHOLD QUESTIONNAIRE AND MEDICAL HISTORY ITEMS

CONFIDENTIAL - The National Health Survey is authorized by Public Law 652 of the 84th Congress (70 Stat. 489; 42 U.S.C. 305). All information which would permit identification of the individual will be held strictly confidential, will be used only by persons engaged in and for the purposes of the survey and will not be disclosed or released to others for any other purposes (22 FR 1687).

FORM **NHS-HES-2**
(11-13-63)

U.S. DEPARTMENT OF COMMERCE
BUREAU OF THE CENSUS
ACTING AS COLLECTING AGENT FOR THE
U.S. PUBLIC HEALTH SERVICE

NATIONAL HEALTH SURVEY

2. (a) Address or description of location (include city, zone, and State)

____

____

ALL

2. How are(is)--related to the head of the household?
(Enter relationship to head, for example: wife, daughter, stepson, grandson, mother-in-law, partner, roomer's wife, etc.)

ASK FOR PARENTS OR GARDIANS OF EC

7. Where were you born? *(Check U.S. box or write in name of country)*	☐ U.S. Foreign country
9. What is the highest grade you attended in school? *(Circle highest grade attended or mark "None.")* (If attended, ask): **(a) Did you finish this grade (year)?**	☐ None Elem.... 1 2 3 4 5 6 7 8 High.... 1 2 3 4 College 1 2 3 4 5+ ☐ Yes ☐ No

ALL EC HOUSEHOLDS

14. Which of these income groups represents your total combined family income for the past 12 months, that is, your's, your--'s, etc? (Show Income Flash Card HES-2(b).) **Include income from all sources, such as wages, salaries, rents from property, Social Security, or retirement benefits, help from relatives, etc.**

CONFIDENTIAL – *The National Health Survey is authorized by Public Law 652 of the 84th Congress (70 Stat. 489; 42 U.S.C. 242c). All information which would permit identification of the individual will be held strictly confidential, will be used only by persons engaged in and for the purposes of the survey and will not be disclosed or released to others for any other purposes (22 FR 1687).*

FORM APPROVED
BUDGET BUREAU NO. 68-R620-54.6

HES-256

DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE
NATIONAL HEALTH SURVEY

(1-5) ____________

CHILD'S MEDICAL HISTORY - Parent

NAME OF CHILD *(Last, First, Middle)* (6-11)	SEGMENT	SERIAL	COL. NO.

NOTE: Please complete this form by checking the correct boxes and/or filling in the blanks where applicable. When you have completed it, keep it until the representative of the Health Examination Survey calls on you within a few days. If there are some questions you do not understand, please complete the others and the person who comes for the form will help you with the ones that were unclear.

(12-14)	1. SEX 1 ☐ Male 2 ☐ Female	2. AGE	3. DATE OF BIRTH *(Month, Day, Year)*
(15)	4. PLACE OF BIRTH *(City or Town, State)*		5. WAS THIS CHILD BORN IN A HOSPITAL? 1 ☐ Yes 2 ☐ No 3 ☐ Don't know

IF YES: (Question 5)

A. About how long did you (the mother) stay in the hospital after the baby was born?

1 ☐ 1 week or less 2 ☐ 1 to 2 weeks 3 ☐ Over 2 weeks 4 ☐ Don't know

B. If mother stayed over 1 week, what was the reason for staying that long?

____

____

C. About how long did the baby stay in the hospital?

(17) 1 ☐ 1 week or less 2 ☐ 1-2 weeks 3 ☐ Over 2 weeks 4 ☐ Don't know

D. If the baby stayed over 1 week, what was the reason for staying that long?

____

6. ABOUT HOW MANY POUNDS DID THE BABY WEIGH AT BIRTH?

(18) 1 ☐ Under 5 2 ☐ 5-10 3 ☐ Over 10 4 ☐ Don't know

8. WAS THERE ANYTHING UNUSUAL OR WAS ANYTHING WRONG WITH THE BABY WHEN HE(SHE) WAS BORN?

(21) 1 ☐ Yes 2 ☐ No 3 ☐ Don't know

IF YES:

A. What was the matter? ____________

____

B. What did the doctor say caused this?

____

9. WHILE YOU (THE MOTHER) WERE PREGNANT WITH THIS CHILD DID YOU HAVE ANY MEDICAL PROBLEMS OR COMPLICATIONS?

(22) 1 ☐ Yes 2 ☐ No 3 ☐ Don't know

IF YES, what kind of trouble did you have? ____________

11. BEFORE THIS BABY WAS BORN, WHILE YOU (THE MOTHER) WERE PREGNANT WITH THIS CHILD, DID YOU (THE MOTHER) SEE A DOCTOR?

1 ☐ Yes 2 ☐ No 3 ☐ Don't know

IF YES:

A. About how many months pregnant were you when you first saw a doctor?

1 ☐ Less than 3 2 ☐ 3 to 6 3 ☐ Over 6 4 ☐ Don't know

B. About how many times altogether did you see a doctor while you (the mother) were pregnant?

1 ☐ None 2 ☐ 1 to 3 3 ☐ 4 or more 4 ☐ Don't know

12. DID YOU (THE MOTHER) HAVE ANY TROUBLE WITH THE PREGNANCY OR BIRTH OF THIS CHILD?

(27) 1 ☐ Yes 2 ☐ No 3 ☐ Don't know

IF YES, what was the trouble? ______________________________

____

15. WAS THE CHILD BREAST FED?

(31) 1 ☐ Yes 2 ☐ No 3 ☐ Don't know

A. IF YES, for about how many months was he(she) breast fed?

1 ☐ Less than 1 2 ☐ 1 to 6 3 ☐ Over 6 4 ☐ Don't know

B. When breast feeding was stopped, how easily did the baby accept the change?

1 ☐ No problem 2 ☐ Some problem 3 ☐ Considerable problem

16. ABOUT HOW OLD WAS THE CHILD WHEN HE(SHE) FIRST WALKED BY HIMSELF?

(34) 1 ☐ Under 1 year old 2 ☐ Between 1 and 1½ years old

3 ☐ Over 1½ years old 4 ☐ Don't know

17. ABOUT HOW OLD WAS THE CHILD WHEN HE(SHE) SPOKE HIS FIRST REAL WORD?

1 ☐ Under 1 year old 2 ☐ Between 1 and 1½ years old

3 ☐ Over 1½ years old 4 ☐ Don't know

18. CHILDREN LEARN TO DO THINGS LIKE EATING BY THEMSELVES AND TALKING AT DIFFERENT AGES. DO YOU THINK THIS CHILD WAS ESPECIALLY <u>FAST</u> IN LEARNING TO DO THINGS, ABOUT <u>AVERAGE</u>, OR SOMEWHAT <u>SLOWER</u> THAN OTHER CHILDREN?

(36) 1 ☐ Faster than other children 2 ☐ About the same 3 ☐ Slower 4 ☐ Don't know

19. DID HE(SHE) GO TO KINDERGARTEN OR NURSERY SCHOOL BEFORE ENTERING THE FIRST GRADE?

(37) 1 ☐ Yes 2 ☐ No 3 ☐ Don't know

32. HERE IS A LIST OF DISEASES THAT CHILDREN SOMETIMES HAVE. HAS THIS CHILD EVER HAD:

	If yes, about how old at the time?		
H. Epilepsy?	1 ☐ Yes → Age____	2 ☐ No	3 ☐ Don't know
J. Cerebral palsey?	1 ☐ Yes → Age____	2 ☐ No	3 ☐ Don't know

35. HERE ARE SOME OTHER KINDS OF ILLNESSES OR CONDITIONS SOME CHILDREN HAVE. HAS YOUR CHILD EVER HAD:

E. A heart murmur?	1 ☐ Yes	2 ☐ No	3 ☐ Don't know
F. Anything wrong with his(her) heart?	1 ☐ Yes	2 ☐ No	3 ☐ Don't know

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