The Journal of Genetic Psychology, 1949, 75, 85-125.

A FINAL FOLLOW-UP STUDY OF ONE HUNDRED ADOPTED CHILDREN*[1]

Iowa Child Welfare Research Station, State University of Iowa

MARIE SKODAK AND HAROLD M. SKEELS

A. HISTORICAL BACKGROUND

While there have been a substantial number of studies reporting the intelligence status of foster children (16, 19, 20, 21, 28, 30) repeated evaluations of the same children into adolescence or early adulthood have been rare. This report constitutes what will probably be a final chapter in a long range study in which the same group of adopted children have had intelligence tests on four occasions. Reports of the results of the first three examinations (24, 25, 26) provoked a great deal of discussion and many questions regarding the *IQ* and the rôle of heredity in determining the eventual status of the children. The intensity of the debates over the relative functions of environment and heredity has dissipated in the past decade as evidence from other studies has shown that modifiability of intelligence is not an unusual phenomenon (13, 15, 22, 23, 28).

As it now appears unlikely that children in this study will be revisited, this report will include details and certain raw data which may be of value to others contemplating similar research. Many problems remain unsolved and an account of practical difficulties may expedite the inevitable preliminary steps in other studies.

The study originally began, not as a research, but as a service project. This difference in orientation accounts for some of the gaps in information, for the techniques selected and for the general planning, which might have been done otherwise had the project been conceived primarily as research. However, there is a practical question of whether the study could have been accomplished at all had it been weighted down with all the scientific safeguards which the perspective of 15 years of study might have suggested. Because of its simplicity and apparent inoccuousness, the study was accepted by lay people, parents, and children with a minimum of explanation.

*Accepted for publication by Robert R. Sears of the Editorial Board, and received in the Editorial Office on December 30, 1948.

[1]This research was conducted under the auspices of the Iowa Child Welfare Research Station, State University of Iowa. Funds for this unit were provided by the Parents Institute, Inc.

This study was made possible when the Board of Control of State Institutions of Iowa instituted psychological services in connection with its Children's Division in 1934. The staff consisted of Harold M. Skeels, Director and Psychologist, and Marie Skodak, Assistant Psychologist. Liaison relations with the Child Welfare Research Station of the State University of Iowa were established through the half-time appointment of Dr. Skeels with that institution. Through coöperative relations with the staff of the Child Welfare Research Station it was possible to amass a substantial body of reliable data on the mental status of the residents of the children's institutions and also to free the regular staff members of the Children's Division for work outside the institutions.

One of the major extramural projects was the examination of all children who had been placed in foster homes and who were about to be legally adopted. While children of all ages were involved, by far the majority were younger children who had been placed as infants. The policies of the institution were determined by an appointed Board who were not selected for academic qualifications or experience in social work or psychology. At that time, neither the Board, nor the institutional staffs, nor the field workers who supervised the children included a single person who had had any formal training or who could be described as a "qualified trained social worker." The head of the Children's Division was a qualified person but was relatively powerless to institute so-called modern social work methods in the face of various pressures. The children were accepted for care in institutions, cared for while in the institutions, and placed in free, wage, or adopting homes largely on the basis of "good common sense" as well as the good judgment or whims of the workers as modified by prevailing pressures or policies. While this rather casual modus operandi produced miscarriages of optimum planning, these were not as numerous as might be feared. The general atmosphere with regard to the younger children was one of sentimental pity rather than punitive aggressiveness, though the latter was not uncommon with the older children. The pressure of physical overcrowding and the demand for children for adoption together with the generally unsophisticated and homey attitude, resulted in a tendency to place children in foster homes at the earliest possible time. Since there were no provisions for boarding funds, the following alternatives were available: (*a*) Wage homes, where in return for services the child received care and some weekly wage or allowance. These were obviously the older children who had usually had some preliminary training in the institution. (*b*) Free homes, where the child was "treated like one of the family" without legal

adoption. He remained a ward of the state, could be removed at the discretion of the supervisor, be returned by the family, or eventually be adopted. Children of all ages were so placed, but the majority were in the elementary school ages. (*c*) Adoptive homes, wherein, after a year of probationary residence, the child was legally adopted. During the probationary residence the child was visited several times by the field worker to determine the adequacy of the care the child received, the compatibility of the parents and child, and to check on the child's development. While children of all ages were placed in adoptive homes, the great majority were infants and preschoolers and in the majority of cases legal adoption was completed within two years after placement. After adoption there were no more official relationships between the family and the institution or the Children's Division.

The extramural services of the psychologists on the one hand provided examination and consultation facilities for those homes where behavior problems were encountered, primarily with older children, and on the other hand offered psychological evaluation of children about to be adopted. The primary purpose of this was to guard against the adoption of mentally retarded children as well as to offer the services of a child development specialist to aid in problems which the adopting parents might encounter or might anticipate.

Through the coöperative arrangements with the University it was possible to offer a similar service during 1934-36 to the Iowa Children's Home Society, a private state-wide child placing agency. This organization, with a better trained staff and boarding home facilities, also placed a substantial number of children in early infancy and arranged for the pre-adoption examination as an additional service to the adopting parents.

Another extramural service performed by the psychologists was the examination of children, and occasionally the mothers of illegitimate infants, where there was a probability that the children would become wards of the state. This preliminary information facilitated the proper institutional assignment and subsequent planning for the children. Since the examinations were frequently conducted in the homes or at a nearby school, the psychologists had an invaluable opportunity to see at first hand the home, neighborhood, and often the relatives constituting the child's early environment or his social-economic heritage.

The foster homes into which the children were placed became available through a number of sources. The child-placing programs of the State Board of Control and the Iowa Children's Home Society were well known

throughout the state since the majority of agency placements were made through them. Both organizations had travelling workers, assigned to certain areas whose duties included: (*a*) The supervision of children placed in wage, free, and adoptive homes to insure proper care, protection, education, and home relationships. (*b*) The evaluation of homes and foster families for children in terms of financial resources, physical set-up, attitudes toward children, future demands on children. (*c*) The development of community interest in child care, adoption, and placement.

Parents interested in adoption would write directly to the state office, the institution, agency, or one of the field workers. The application blanks contained only the minimum information regarding the type of child desired, the family's financial and vocational status, and the names of at least three references. The field worker would then visit the home, interview the applicants, evaluate the physical and emotional resources and the possible future demands with regard to education and vocation. References were contacted by mail, phone, or visit. The degree of investigation varied. Families who were well known or who were manifestly capable were accepted with less scrutiny than families in more modest circumstances or where there were questions regarding the present or future adequacy of the home. It is not known what proportion of applicants were rejected, but in many cases families were dissuaded from completing an application if it seemed unlikely that a child would be placed with them.

On the whole the foster families were above the average of their communities in economic security and educational and cultural status. They were highly regarded by the town's business, professional, and religious leaders and usually had demonstrated a long-time interest in children through church or community activities.

The placement procedure in both organizations was essentially similar. In the state agency after the application was accepted the family was placed on the waiting list and their name was considered at the monthly staff meetings when assignments were made. At these case conferences, attended by the head of the Children's Division, the superintendent of the institution, the psychologists, and head nurse, the available babies and available homes were discussed. Factors in the assignment included religion, sex, age, color or complexion, physique, medical history, and report of the family background. Pre-placement psychological examinations were not available for the children in this study. In many instances the information about the child's family background was so meagre that it was of little or no value. The primary factors in matching were the stipulations of the foster parents regarding religion, sex, and hair color in that order.

This method of placement of children from relatively inferior socio-economic backgrounds into substantial homes thus provided the setting for the study. Perusal of the child's social history as recorded in the institution and comparison with the field's agent's pre-placement evaluation of the adopting home was disheartening. It did not seem possible that children with such meager possibilities, as projected from the intellectual, academic, and occupational attainments of their parents, could measure up to the demands of cultured, educated parents. Yet careful examination of one child after another showed none of the retardation or misplacement which might have been anticipated. Following a preliminary survey of results (24) it was decided that a follow-up study was imperative, and the coöperation of the foster parents was solicited and received.

B. Description of the Sample

A detailed report of the population of which the children in this study constitute a sample was presented in 1945 (26).

In general there are three levels of society from which children for adoptive placements originate. It is believed that children from culturally, socially, and educationally superior homes tend to be placed among relatives or in adoptive homes through various private sources. Because of the extreme difficulty of identifying and locating such placements, no studies have been made of the subsequent development or adjustment of these children, nor is the exact number of these children known to official agencies. At what may be described as the second socio-economic level, the children tend to become the charges of private or semi-private child caring or placing agencies. Many of these children's aid and protective societies exercise considerable control over their intake. Policies may, for instance, preclude the acceptance of children of mentally defective parents, or of other children who may be judged "unplaceable" or in need of care which that particular organization does not feel equipped to offer. These organizations tend to draw from the various middle economic classes but also have a fair number of children from extremely ineffective homes as the study by Roe and Burks indicates (21). The third group of children from the lowest socio-economic levels are usually known to various public welfare agencies. The public agencies, in contrast to the private ones, are usually obligated to accept all children committed to their care and naturally receive children no other agency feels able to accept. There is no doubt that the general social, vocational, and adjustment level of the parents of children committed to public agency care is substantially below that of children who become wards of private agencies or who are adopted through private channels.

It is necessary to differentiate between observations regarding the natural families of infants committed for care and the natural families of preschool or older children. All studies which have published reports on the education of the true parents of children placed in foster homes agree that the true parents of the older children are more apt to be inadequate, unstable, retarded, unemployed, in other words, less competent by any criterion of measurement which has been used. The social factors behind this difference are not difficult to identify. The youngest children, the infants, are primarily illegitimate children. In the first place, their parents are relatively younger. While parents-out-of-wedlock show various signs of emotional instability, the psychoses, alcoholism, and cumulating effects of maladjustment characterizing the parents of older dependent children have not yet indelibly affixed themselves. With the rest of their generation, the younger parents enjoy higher educational opportunities together with the dubious benefits of being "lifted" from grade to grade on the basis of physical size rather than academic accomplishment. Vocationally it is understandable that an 18-year-old youth is a farm hand or truck driver's helper, while an adult of 40 on the same job is prima facie scored well down on the scale of occupational success. The young illegitimate parents have not had the accumulating frustration of economic deprivation, children in unwanted numbers, and the growing weight of community disapproval of their inefficient way of living. For many it is the first, and often the only, social transgression and after this experience many, perhaps even the majority of illegitimate parents, go on to establish secure, socially acceptable homes and families. A study of what happens to illegitimate parents who decide to establish a family together, as compared to those who release their child, may shed some interesting light on the factors which operate to produce the poorer histories among the older children as compared to the younger. There is a significant socio-economic difference between the parents of the younger and older groups of children who become dependent. It does not necessarily follow, however, that this difference is genetically determined.

1. *Subjects of This Study*

The criteria for inclusion in this study were as follows: (*a*) The child was placed in an adoptive home under the age of six months. (*b*) The child had been given an intelligence test prior to November, 1936, and after one year's residence in the adoptive home. (*c*) Some information, though of variable amount and reliability, existed concerning the natural and the adoptive parents. (*d*) The child was white, of North European

background (it so happened that no children of South European, Latin, or other social backgrounds met the other criteria either).

In this study all of the children were received for care as infants. The Iowa Soldiers' Orphan's Home, identified as the public agency, was the placing agency in 76 per cent of the cases and the Iowa Children's Home Society, a state-wide, private, non-sectarian organization placed 21 per cent. The remaining three children were privately placed and were included because they were available and met the criteria set up for the other children.

It was earlier pointed out (26) that 96.6 per cent of the 319 children committed to the two agencies under the age of six months between 1933-1937, were placed in adoptive homes. In only four cases was the child withheld from adoptive placement because of poor family history. The remaining seven had serious health problems. Since the majority of the children originally in the study had been placed during this period, and the remainder had been placed earlier during a time when the policies regarding family background had been even more lenient, it was concluded that the children in the study were representative of all those placed by these organizations.

During 1934-36, when the mental testing program was coördinated for the two agencies, and 1933-37 for the public agency alone, it was found that 90 per cent of the children placed under six months of age had been given at least one intelligence test. The mean *IQ* of this group was 119, slightly above the mean *IQ* of 116 achieved by the members of the follow-up group on the first examination during the same calendar years.

It was evident that the group of children who constituted the first sample were representative of the available children since there was no systematic withholding of numbers of children because of poor histories, nor was there a group with lower initial intelligence test scores who were excluded from the study.

In the first follow-up report (25), out of a total of 180 children who met the criteria of age at placement, race and date of examination, it was possible to retest 152 children during 1937-38. On the third examination 139 children were seen during 1940-41 (26) and the fourth and final visit in 1946 resulted in the present sample of 100. The major factor in the reduction of the size of the sample has been time and expense. The families, all originally in Iowa, are now scattered over many states and Canada. To locate and visit the 100 children in the 10 weeks available for the study, it was necessary to drive over 12,000 miles even though accurate addresses were

available and careful preliminary arrangements had been made with planned appointments acceptable for the parents and the child.

a. Losses between Test I and Test II. A total of 180 children under six months of age had had an intelligence test prior to November, 1936. The first re-examinations were given between December of 1936 and October of 1937. A few children were excluded because less than a year had elapsed since the first examination, but the majority were dropped because travel schedules and the convenience of the family did not happen to coincide. Four families did not wish to coöperate further. Twenty-two families either could not be located, were known to have left the state, or could not be conveniently scheduled for retests.

b. Losses between Test II and Test III. Between 1937 and the third examination in the summers of 1939 and 1940, the sample decreased from 154 to 139. The 15 children who dropped out of the study at this point included 10 who had moved out of the state, four whose families refused to coöperate further, and one who was returned to the institution because of the cruelty and neglect of the foster parents.

c. Losses between Test III and Test IV. Between 1940 and 1946 World War II was fought, and research was immobilized by gas and tire rationing and the universal shortage of professional personnel. A fortunate combination of circumstances freed the author (M.S.) who has given the majority of the tests, for a 10-week period. The preliminary planning and a preliminary registered-mail inquiry, with a questionnaire to be returned by the family, facilitated the optimum utilization of time. A copy of the letter and questionnaire may be found in the Appendix. At the time of the fourth examination, seven additional families declined to coöperate further, eight had moved from the state, two were contacted but could not be scheduled because of various conflicts, and the remaining 22 did not respond or could not be reached by registered mail through their 1940 address. On the basis of the letters received from the parents who had moved and from previous knowledge of the families from whom no response was received, it is estimated that approximately 20 of these children could have been seen had time and funds permitted.

The comparisons between the continuous group of 100 and those who dropped out at the various retest points, are given in Table 1.

These figures account for the original 180 children who met the qualifications for age at placement in an adoptive home and date of first examination. Systematic selection which would influence the character of the final group of 100 is not evident from the comparisons between the mean *IQ*'s of the group

TABLE 1

	Test I	Test II	Test III
Continuous Group (*N* 100)	117	112	115
Dropped after 1940 (*N* 39)	113	107	110
Dropped after 1937 (*N* 15)	114	111	
Dropped after 1936 (*N* 26)	120		

at the various re-examination periods. The standard deviations for all means are large, ranging from 11.9 to 17.2, and none of the differences is statistically significant.

It may be concluded that this group of 100 children is probably representative of the total group placed by these agencies at comparable ages, and that conclusions based on the pattern of mental development of these children are probably applicable to others with similar experience and social backgrounds and placed under similar circumstances into comparable homes.

2. *Test Techniques*

The purpose throughout the study was to secure the most reliable and valid measure of the child's intellectual ability at the time of the examination. On first examination the children ranged from 11 months to six years in age with 78 per cent of the children between one and three years. Four children had been placed at a few days of age and were tested shortly before the expiration of the one-year observation period. The 1916 Stanford-Binet was suitable for use with the 19 per cent over three years of age and was occasionally used with younger children who were obviously accelerated in mental development. The Kuhlman Binet was routinely used with all children under three years, and occasionally as a clinical supplement with some children over three.

The re-examinations were begun in 1936 when the Revised Stanford-Binet was not generally available and the 1916 revision was consequently used. In this series of tests, although 17 per cent of the children were under 3-0 years of age, they were all over 2-6 and sufficiently accelerated to make the 1916 Stanford-Binet a usable test. Therefore, all test scores reported for the second examination were based on the 1916 revision.

When the third examination was scheduled in 1939-40, the question of "best test" was raised. From the standpoint of fatigue and future rapport, it seemed advisable to limit the number of tests given and the 1916 revision was again selected. Survey of the literature (7, 14, 18) showed that between 5 and 11 years, the ages of these children at the third examination, the results of the 1916 and 1937 scales were most nearly identical. Not only

had the 1916 test been used in the earlier examinations, but it also had been used in examinations of the mothers and a few of the fathers of the children. Direct comparisons of test scores were thus made possible without getting into the knotty problems of comparability of standardization of the different revisions. The problems of such a long-time research underscore the need for an intelligence test which results in comparable scores at all ages.

When the fourth and last examination was scheduled in 1946, the children were between 11 and 17 years of age. In view of the problems surrounding the 1916 revision at these ages, it was decided to impose on the good nature of the subjects and give both the 1916 revision and Form L of the 1937 revision. This set up a program involving approximately two hours, often a great deal more, if there was marked scatter on either or both tests. Since there are a number of overlapping items, these were given and scored simultaneously. The 1916 revision was completed first and the 1937, Form *L*, second. Whatever advantage of practise effect there might have been, was judged to be cancelled by fatigue. Every effort was made to keep the interest and effort of the examinees at an optimum level. No subject refused to take the tests after an appointment was made and only two were openly antagonistic in typical adolescent behavior. Even these were persuaded to cooperate and no greater compliment to the intrinsic interests of the tests can be made than to say that in spite of themselves even these reluctant subjects became interested and made scores consistent with their earlier test results and their current school placements.

All of the third and fourth tests, and all but five or six of the first two tests were given in the foster homes. This made it possible to observe the relationships between child and parents, the fluctuation in family economic and cultural status over the 13-year period, and to sample the child's behavior in the home situation. A cordial relationship developed between the parents and the examiners as a result of these repeated visits. The first examination was usually a highly emotional experience for the parents, who understood that the psychologist's word was final in approving or disapproving the completion of adoption. In a sense this was even more crucial than the court action since as one parent stated "we were taking an examination in parenthood. Our success was shown by the results in our child." The majority of the families, located in areas where clinics and psychologists were not available but who were familiar with these resources through reading and the radio, availed themselves of the opportunity to discuss various child rearing problems. As would be anticipated, the character of the problems changed with age, and on the fourth visit dealt with problems of adolescence,

vocational choices, educational plans, emancipation from the home, etc. There seemed to be no problem which was unique to this group of children as compared to any other group of similar age. The problem of information concerning their own adoption had been well solved by nearly all the families. Surprisingly enough two families had still not "told," but other evidence indicated that these children probably guessed. In two or three instances there had been community problems in which, despite the efforts of the foster parents, the children had had a very difficult adjustment to the adoptive status.

All the parents were aware of the research nature of the re-tests and were, on the whole, proud of the distinction. Through their contribution they felt they could facilitate early placement of children in adoptive homes and provide reassurance to families uncertain about adoption.

Relationships between the children and the examiners were more casual. Some of the children recalled the examiner's visits from one occasion to the next, and when they did, it was in terms of the fun of playing games with an unusually agreeable person. An explanation was made to all participants during the fourth examination following the general pattern that:

> When you were a younger boy, you were a member of a group of boys and girls all over the state who were given tests like this. We wanted to find out how well children could do different sorts of things, how well they could remember, figure things out and so on. Now that they are older, we would like to see how much they have changed and in what way. The tests are a little like a quiz program on the radio and most people find them rather fun.

In a few instances the question was raised as to whether children who were not adopted were also tested and the subjects were assured that children in many places also took similar tests. Two of the participants, one, the oldest subject, who had completed one year in college, and one a superior high school senior with decided research interests, were familiar with the published reports of the study and coöperated delightfully.

C. Mental Development of the Children

All of the children had been seen on four occasions and a few for various reasons had been given additional tests. In these cases the test given at an age nearest the mean age for the group was selected for use in the major comparisons. Distribution of the ages at which the tests were given is presented in Table 2. The mean age at first examination was *2 years 2 months,* at second examination *4 years 3 months,* at third examination *7 years 0 months* and at fourth examination *13 years 6 months.*

TABLE 2
AGES OF 100 FOSTER CHILDREN AT TIME OF TEST

Chronological age	Test I	Test II	Test III	Test IV
0-6 to 0-11	3			
1-0 to 1-11	55			
2-0 to 2-11	23			
3-0 to 3-11	12	28		
4-0 to 4-11	4	33	2	
5-0 to 5-11	2	12	15	
6-0 to 6-11	1	4	53	
7-0 to 7-11		5	7	
8-0 to 8-11			14	
9-0 to 9-11		1	2	
10-0 to 10-11			6	
11-0 to 11-11			1	13
12-0 to 12-11				25
13-0 to 13-11				38
14-0 to 14-11				12
15-0 to 15-11				5
16-0 to 16-11				5
17-0 to 17-11				1
18-0 to 18-11				1
Number	100	100	100	100
Mean	2 years, 2.3 months	4 years, 3.4 months	7 years, .1 month	13 years, 5.8 months
Median	1 year 10.2 months	4 years, 1.9 months	6 years, 7.5 months	13 years, 4.8 months
Standard Deviation	13.08 (mo.)	16.4 (mo.)	17.0 (mo.)	16.3 (mo.)

The group included 60 girls and 40 boys. The range, median, and mean ages for both sexes were essentially the same.

Table 3 shows the results of the examination described earlier. Ages and results may be summarized for the 100 children as given in Table 4.

The mean *IQ* of this group of children has remained above the average for the general population throughout early childhood, school age, and into adolescence. It would be generally accepted that if major changes in intellectual functioning occur after this age, they probably result from psychiatric and emotional problems rather than from developmental abnormalities.

An interesting problem in test evaluation is posed by the results from the "simultaneous" administration of the 1916 and 1937 Stanford tests. Comparative studies of the 1916 and 1937 revisions support the general impression of clinicians that the 1937 revision tends to overrate the average or above average adolescent, while the 1916 revision tends to underrate him. This dilemma was frequently encountered in the examination of these children since differences of 15-20 points between the two tests were moderately

TABLE 3

IQ DISTRIBUTION OF TESTS OF CHILDREN IN FOLLOW-UP STUDY

IQ	Test I	Test II	Test III	Test IV (1916-S.B.) (*CA* to 16)	Test IV (1916-S.B.) (*T-M* Table)	Test IV (1937-S.B.) (Form *L*.)
150-154	1					1
145-149	0	2	2			1
140-144	3	1	2	1	1	3
135-139	6	3	3	0	0	7
130-134	5	9	4	2	2	12
125-129	15	5	16	7	11	6
120-124	14	8	6	11	9	14
115-119	15	8	16	12	16	13
110-114	12	20	17	12	9	14
105-109	10	17	13	15	16	10
100-104	8	11	9	13	16	9
95- 99	7	5	6	10	4	2
90- 94	1	7	3	5	6	3
85- 89	1	4	2	5	4	0
80- 84	2		1	2	3	3
75- 79				2	1	1
70- 74				2	2	1
65- 69				1		
Number	100	100	100	100	100	100
Mean	116.8	112.4	114.8	107.1	108.8	116.8
Median	117.5	111.0	114.2	107.85	108.9	117.2
SD	13.55	13.75	13.20	14.40	13.90	15.45

TABLE 4

Test	Age	Mean *IQ*	*SD*	Range	Median
I	2 yrs. 2 mo.	117	13.6	80-154	118
II	4 yrs. 3 mo.	112	13.8	85-149	111
III	7 yrs. 0 mo.	115	13.2	80-149	114
IV (1916)	13 yrs. 6 mo.	107	14.4	65-144	107
IV (1937)	13 yrs. 6 mo.	117	15.5	70-154	117

frequent. Years of clinical and guidance experience with young people of these ages provided a background against which the quality of their responses, their school achievement and their general intellectual maturity as evaluated from an interview could be projected. The result was a feeling of dissatisfaction with both tests and a fervent wish that a more adequate instrument were available.

The test results are presented here as they were obtained. In computing the *IQ* on the 1916 tests, 16 years was used as the maximum divisor, following Terman's instructions. In computing the *IQ* on Form *L*, the Terman-Merrill tables were used, which provide for a gradual rather than abrupt change in relationship between chronological and mental age. The next to last column in Table 3 shows the effect of using the same Terman-Merrill table with the mental age secured on the 1916 Stanford-Binet. There is a slight rise in mean *IQ* from the corrective effects of the table but this is not enough to account for the total difference between the two tests. The difference, however, is not statistically significant (*CR* 1.6) but its consistency and general character is shown in both Table 5 and the detailed presentation in the Appendix.

The general trend of *IQ*'s where the tests are distributed by age, is shown in Table 5. *IQ*'s reported for years one and two are based on the Kuhlmann scale, for years 3-10 the 1916 Stanford, and years 11-15 the 1916 and 1937 Stanford as indicated. Beyond 14 years of age the number of subjects in each age group was too small to warrant inclusion. The small number of cases at 10 and 11 years resulted from the long interval between third and fourth examinations. Repeated cross section analysis of the results shows that the group has consistently achieved a higher average mental age than would be found in a representative sampling of the total child population of the same age. Detailed statistical analysis of this material is not possible since every test for each child is presented, including some which are not used in the major comparisons. While fluctuations do occur, accentuated by the small numbers of cases at single age levels, the findings are essentially the same

TABLE 5

IQ BY AGE AT TEST

IQ	Age—years 1	2	3	4	5	6	7	8	9	
155-159										155-159
150-154		1								150-154
145-149			1	1		2				145-149
140-144	3			1		1				140-144
135-139	3	3	1	2		2	1	1		135-139
130-134	2	2	4	6		1	2		1	130-134
125-129	7	7	1	4	3	5	4	1	2	125-129
120-124	6	6	4	2	4	4	1	1	1	120-124
115-119	4	7	6	3	4	7	2	4	1	115-119
110-114	4	9	5	6	4	9	6	2	2	110-114
105-109	6	4	3	5	6	7	5	1	1	105-109
100-104	3	4	1	6	1	5	4	1	1	100-104
95- 99	1	3	4	2	3		2	2	1	95- 99
90- 94			1	4	2	1	2	1		90- 94
85- 89			1	3		1		1		85- 89
80- 84			1			1		1		80- 84
75- 79										75- 79
70- 74										70- 74
65- 69										65- 69
60- 64										60- 64
Number	39	46	33	45	27	46	29	16	10	
Mean	120.10	117.45	113.95	113.35	111.25	115.50	112.35	108.85	115.5	
Median	120.75	116.64	114.92	111.58	111.38	113.94	110.75	112.0	114.5	
SD	12.20	11.85	14.65	16.0	10.35	13.80	12.10	14.55	10.95	

TABLE 5 (*continued*)

	Age—years									
	10	11		12		13		14		
		SB '16	SB '37	SB '16	SB '37	SB '16	SB '37	SB '16	SB '37	
155-159										155-159
150-154							1			150-154
145-149							1			145-149
140-144			1			1	1		1	140-144
135-139			2		1		2		1	135-139
130-134		1		1	3		5		1	130-134
125-129	1	3	1	1		2	4	1		125-129
120-124			1	2	3	8	4	2	5	120-124
115-119	2		1	3	3	7	5		4	115-119
110-114		1		1	4	2	3	5	3	110-114
105-109	2	1	1	5	2	5	4	3	2	105-109
100-104		2		4	1	3	2	4	5	100-104
95- 99				1	1	1		4	1	95- 99
90- 94				1		3			1	90- 94
85- 89		1						5		85- 89
80- 84		1				1	1		1	80- 84
75- 79							1	1		75- 79
70- 74						1				70- 74
65- 69										65- 69
60- 64										60- 64
Number	5	10	7	19	18	34	34	25	25	
Mean	114.0	110.5	127.0	110.4	117.30	111.25	120.10	102.40	112.80	
Median	115.75	109.5	127.0	108.0	116.17	115.21	120.75	102.63	113.67	
SD	7.15	16.75	11.65	10.25	10.75	14.0	15.90	12.40	13.55	

as in the earlier reports. The mean *IQ* of this group has remained consistently above the average of the population as a whole at each age level.

TABLE 6
CHANGES IN *IQ* BETWEEN TESTS

	Between Test I and II Number	Between Test II and III Number	Between Test III and IV '16 Number	Between Test III and IV '37 Number
+36 to +40				
+26 to +35	1	4		
+16 to +25	7	7	1	1
+ 6 to +15	11	26	12	14
— 5 to + 5	34	42	30	32
— 6 to —15	25	17	30	34
—16 to —25	18	4	25	18
—26 to —35	3		2	1
—36 to —45				
—46 to —50	1			
Total	100	100	100	100

	Between Tests I and III Number	Between Tests I and IV '16 Number	Between Tests III and IV '37 Number
+36 to +40	2		
+26 to +35	2	2	2
+16 to +25	5	5	5
+ 6 to +15	21	12	14
— 5 to + 5	30	19	21
— 6 to —15	23	29	29
—16 to —25	13	16	14
—26 to —35	3	11	10
—36 to —45	1	6	5
—46 to —50			
Total	100	100	100

	Between Tests II and IV '16 Number	Between Tests II and IV '37 Number
+36 to +40		
+26 to +35		1
+16 to +25	8	8
+ 6 to +15	15	17
— 5 to + 5	22	26
— 6 to —15	31	31
—16 to —25	21	14
—26 to —35	3	3
—36 to —45		
—46 to —50		
Total	100	100

Rather wide fluctuations in *IQ* between tests were found throughout the entire period. Table 6 summarizes the changes found. The general trend is toward losses when the first test is taken as the basis of comparison, as the mean *IQ* on succeeding tests would indicate. Since the total number of cases is 100, the percentages may be computed automatically and only the actual number of cases is given in the table.

These results, together with the correlations reported later, are consistent with findings from other studies, (3, 4, 13, 23) which show that *IQ* fluctuations of considerable magnitude are found among children who live with their own parents. The greater the time span between tests the greater the probability of wide difference between successive test scores. From a clinical standpoint this serves as an additional caution in the use of a single test score in long range prediction of intellectual attainment. Yet inspection of the raw data for individuals, as shown in the Appendix, gives somewhat more assurance. By and large the children did not change their positions relative to the population as a whole as drastically as these figures might lead one to conclude. When marked changes occurred there were related factors which could usually be identified in the individual instances.

Correlations between successive tests may be summarized as given in Table 7.

TABLE 7

	Test II	Test III	Test IV '16	Test IV '37
Test I	.54±.05	.44±.06	.35±.06	.35±.06
Test II		.70±.03	.58±.05	.59±.04
Test III			.71±.03	.75±.03
Test IV '16				.92±.01

These correlations do not differ markedly from those reported in other studies (2, 11) where the retests are separated by similar time intervals. From the standpoint of prediction of individual status in terms of the child's future *IQ*, the early tests may be considered disappointing, yet this group is not unique in its variability or its fluctuation from one examination to the next.

Of special interest are those children whose early mental development was average and who as adolescents are below 85 *IQ*. These cases, numbered 41G, 47G, 48G, 76G, 81G, 82G, 23B in the Appendix, include five children who occasioned concern from the beginning of the study. Three of them have been seen by psychiatrists at the initiative of the parents and are the only children in the group who have been referred for such help. No. 41G is a shy, diffident compulsive neurotic who is described as a meticu-

lous housekeeper, who doesn't leave a task until it is complete in every detail. Characteristically she does poorly wherever there is a time limit and fails all tests at school though her homework is perfect and her individual reports to the teachers are good. She repeated the eighth grade, but in a medium sized high school she is a *B* student. It was felt that the 1916 Stanford-Binet *IQ* of 79 did not adequately represent her functional level. Nos. 82G and 76G are two of the disturbed children in the study. They have long histories of inexplicable erratic behavior similar to that seen in some post encephalitis cases. The tests have shown consistently wide scatter reflecting the difficulties in concentration, the short interest span, the erratic achievement of which teachers invariably complained to the parents. School progress has been based on other factors than achievement. As adolescents both have shown somewhat improved stability. In both cases it was felt that the test results adequately represented present functioning levels. Children 47G and 48G succeeded in making average scores as younger children, but the quality of their responses was consistently poor. These were the only children in this study whose legal adoption had been deferred a year since it was feared that their development might not prove to be normal in spite of an *IQ* of 100 on the Kuhlmann tests. Both have been unusually prone to severe accidents and illnesses including a skull fracture for 48G. They have been frail, thin children and on the basis of their physical health and interrupted schooling have attended special classes. It was felt that the tests adequately represented their present intellectual and academic ability. However, they have had splendid home training, are competent dancers and musicians, are socially poised, and thus give an impression of ability beyond the test scores.

Cases 81G and 23B are children in very simple home environments, where the intellectual stimulation is limited. In one home the father is dead, in the other extremely busy. Children of low average academic ability satisfy the aspiration levels of the parents. In neither case are the children encouraged to attain maturity or independence.

D. Relationships between Mental Development of Adopted Children and Characteristics of Their Foster Parents

1. *Occupational Level*

In the selection of foster homes all agencies give preference to families who not only have sufficient financial resources to assure adequate care for the child, but who show signs of culture, refinement, and intellectual and emotional understanding of the needs of children and the special problems of adoption.

The occupational level of foster families reflects this initial selection and has remained consistently well above the average for the general population. Table 8 shows the foster father and the true father occupations com-

TABLE 8
DISTRIBUTIONS OF TRUE AND FOSTER FATHER OCCUPATIONS

Occupational classification	General U. S. population employed males, 1930 Per cent	True fathers Number	True fathers Per cent	Foster fathers Number	Foster fathers Per cent
I. Professional	3.1	2	2.7	14	14.0
II. Semiprofessional and managerial	5.2	3	4.1	17	17.0
III. Skilled trades	15.0	9	12.3	27	27.0
IV. Farmers	15.3	5	6.8	29	29.0
V. Semiskilled	30.6	10	13.7	8	8.0
VI. Slightly skilled	11.3	9	12.3	5	5.0
VII. Day laborers	19.5	35	48.0		
Number	100.0	73		100	
Mean	4.8	6.47		2.85	
Median	5	6		3	
Standard deviation	1.5	1.77		1.33	

pared with the occupational distribution of the population as a whole, based on the 1930 census and classified according to Goodenough's seven-point scale (9). Figures for the 1940 census are not directly comparable because of differences in classification method, particularly in the clerical, sales, skilled, and slightly skilled occupations.

In 1940 in the U. S. as a whole, 4.4 per cent of employed males were in professional occupations. In Iowa they constituted 3.7 per cent of the employed population while 14 per cent of the foster fathers were so employed. Although only 14 per cent of employed U. S. males are farm proprietors or managers, 29.5 per cent of Iowa men and 29 per cent of the foster fathers are so employed, thus farmers were adequately represented. In the U. S. approximately 17 per cent of men and in Iowa 19 per cent are unskilled laborers. None of the foster fathers, but 48 per cent of the natural fathers are so classified.

Further comparison between the figures for the foster parents, the general population, and the data for 73 true fathers for whom occupational information was available shows that the foster fathers are not only above the average of the population with a mean scale score of 2.85 as against 4.8 for the U. S. as a whole, but are conspicuously above the mean for the true fathers. The latter are, in addition, well below the mean for the total

population with an average scale score of 6.47, equivalent to the status of an unskilled or very slightly skilled workman. The children whose natural parents, as a group, come from one extreme of the population were placed in foster homes representing the opposite extreme in occupational status.

Observation of the homes over the 13-year period showed that, although they were above the average in culture, resources, and financial security at the time the child was placed, they were, on the whole, even more prosperous at the end of the study. Only two fathers had been in military service, one as a professional man and one as a non-commissioned draftee. While some had benefited from high war wages, others on fixed incomes had been at a slight disadvantage. The general economic prosperity of 1945-47 was evident in most cases.

In a number of families rather serious changes in total family constellations had occurred. Among the 100 children five foster fathers and one foster mother had died by the time the children reached adolescence. None of the surviving foster parents had remarried and none seemed to plan to do so. No two families were affected by the bereavement in the same way. In four instances the foster mothers and the children seemed to be closer than they had been before. In only one case did this seem to have an undesirable emotional consequence for the child. In two instances there appeared to be increasing difficulty in relationships between the surviving foster parent and the children. In both cases there had been marked attachment to the deceased parent and a rather unsatisfactory plan for care and supervision or financial support after the death of the favored parent. Both children were becoming resentful, uncoöperative, and failing in school.

Serious illnesses, affecting family income and security, had occurred in six families. One foster mother, whose instability had been noticed in 1937, finally became psychotic and was hospitalized. The foster daughter of 15 has been keeping house very well for herself and the foster father. This is a family with one of the lowest cash incomes in the group but standards of cleanliness and order were very good. One father has been under periodic psychiatric treatment but has maintained a prosperous business. Another was absent from the home for several years as a wandering alcoholic, but has returned and is making a good adjustment. One father, suffering from a brain injury, and another father and a mother suffering from chronic heart disease have been invalids at home. There was no indication that the presence of these major health problems has had an unusual affect on the children. The general attitude was one of acceptance and understanding on the part of the children. The parents in good health were apt to

be over anxious about insuring the continuance of education and economic and emotional security for the child.

In three of the 100 families the foster parents had been divorced. In all three instances the foster mothers had deserted and left the boys with the foster fathers. Two of the foster fathers had remarried and in both instances the foster mothers were sincerely interested in the children and showed more insight and intelligence than the original foster mothers had demonstrated during the earlier contacts. The boy whose father had not remarried was living with an elderly relative who disapproved of the foster father and the apparent exploitation of the boy's athletic skills. All three of these boys were having much difficulty in school and were having a generally difficult adolescence, but were neither delinquents nor seriously disturbed emotionally.

Relationships between the child's *IQ* and foster father's occupation are obscured because the personal qualities, the cultural opportunities and intellectual stimulation of the homes are not directly reflected by the occupational classification of the families. The opportunities of many of the farm (Class IV) and skilled trades (Class III) homes exceeded some of the teachers', physicians', and managerial homes (Classes I and II). The results, however, summarized in Table 9, show persistent slight differences in favor of homes in the upper three categories. Comparisons for all years except the first two are based on the 1916 Stanford-Binet. Since all available test scores were utilized and the number of cases at any year is small, detailed analysis is not attempted.

It can be concluded that, on the whole, children in homes in the higher occupational categories tend to have somewhat higher mean *IQ*'s at all ages. However, all the children, including those in homes of lesser occupational levels, are above the mean for the total population at all age levels where the number of cases is sufficient to warrant consideration.

2. *Education*

The distribution of educational attainment of the natural and foster parents is shown in Table 10. The average school attainment of the foster parents as recorded on the application record and verified in 1946 showed that mean and median attainment for the foster parents was high school graduation, with 15 per cent having completed college. According to the 1940 census figures the median education for native Iowans in a comparable age group (35-44 years of age in 1940) was 8.8 for males and 9.3 for females. In general, urban populations have an average of one more year of education than rural populations.

TABLE 9

COMPARISONS OF MEAN *IQ* AT AGES 1-16 FOR 100 CHILDREN PLACED IN UPPER THREE AND LOWER FOUR OCCUPATIONAL CATEGORIES

	Ages															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Mean *IQ* Upper 3	121	114	115	115	116	115	113	113	—	108	121	108	112	103	98	98
Mean *IQ* Lower 4	117	114	114	107	107	116	87	113	105	82	112	106	111	99	86	—
Number Upper 3	37	23	24	24	20	30	11	9	0	5	16	30	44	16	6	10
Number Lower 4	23	15	16	15	9	28	1	5	3	1	10	21	30	10	4	0
SD Upper 3	13.5	11.7	13.0	14.4	10.0	14.1	14.3	9.7	—	13.6	10.4	9.0	16.4	11.3	10.6	13.5
SD Lower 4	10.0	15.3	12.9	14.1	12.2	13.0	—	11.6	6.3	—	9.0	10.9	11.3	9.5	10.3	—

TABLE 10
DISTRIBUTION OF TRUE AND FOSTER PARENT EDUCATION

School attainment	True fathers No.	%	True mothers No.	%	Foster fathers No.	%	Foster mothers No.	%
20					3	3.0		
19							1	1.0
18					6	6.0		
17					2	2.0	1	1.0
16	2	3.4			10	10.0	14	14.0
15	1	1.7			7	7.0	9	9.0
14	2	3.4	2	2.2	2	2.0	10	10.0
13	3	5.0	6	6.5	14	14.0	16	16.0
12	15	25.4	24	26.0	16	16.0	18	18.0
11	7	11.8	9	9.8	3	3.0	5	5.0
10	3	5.0	7	7.6	6	6.0	8	8.0
9	3	5.0	9	9.8	5	5.0	3	3.0
8	13	22.0	23	25.0	23	23.0	9	9.0
7	5	8.5	8	8.7	2	2.0	4	4.0
6	2	3.4	2	2.2			1	1.0
5	2	3.4						
Less than 4			2	2.2	1	1.0	1	1.0
Unknown	41		8				1	
Number	59		92		100		100	
Mean	10.05		9.80		12.09		12.31	
Median	10.57		9.78		12.13		12.56	
SD	2.73		2.31		3.54		2.89	

The educational status of the true parents is significantly below that of the foster parents and is below the average of a comparable age group for the state. The 1940 census showed that native Iowans 25-34 years of age had a mean education of 10.2 for the males and 11.0 for the females. While the information on the education of foster parents is reasonably accurate, there is evidence that the education of the natural mother has been overstated by an average of one year (12, 26).

These data again show that while the education of the foster parents is superior to the average for their age and region, the natural parents' education is below the average for their age and region.

Correlations between foster parent education and child *IQ* on successive tests are summarized in Table 11.

Earlier reports on somewhat larger numbers of children showed a slight positive correlation between foster child *IQ* and foster parent education (24, 25, 26). In this array of correlations there is no discernible trend except a consistent lack of statistical relationship. Inspection of the original scatter diagrams confirms the lack of relationship. However, it should be pointed out that both the *IQ*'s and the educations represented here are confined to the upper segment of the total possible range. As long as the parents

TABLE 11

	Foster mother education	Foster father education
Child's Test I	—.03±.07	.05±.07
Child's Test II	+.04±.07	.03±.07
Child's Test III	.10±.07	.03±.07
Child's Test IV (1916)	.04±.07	.06±.07
Child's Test IV (1937)	.02±.07	.00±.07

are highly selected, and the children as a group also have a limited range of *IQ*'s and are in the upper half of the total population, it is not likely that repetition of similar studies will produce any more significant correlations. Increasing the number of cases may extend the range and sharpen the focus on what little difference exists. These figures are lower than correlations generally reported in the literature for both foster child-foster parent and own-child-parent correlations. However, in other cases the range for both distributions has been wider.

The only conclusions which may be drawn from these data are that the foster parents are above the average of their age and regional group in education and that the children in these homes are above the average in mental development. The differences between these adoptive parents in amount of formal education completed are not reflected in differences in intelligence between the children.

E. Relationships between Mental Development of Adopted Children and Characteristics of Their True Parents

1. *Intelligence*

Intelligence test results were available for 63 of the true mothers. All were based on the 1916 Stanford-Binet except one Terman Group Test, two Otis, and one Wechsler-Bellevue. Since the scores on these tests were consistent with other evidence on the mental adequacy of the mothers, the scores were included. The tests were given by trained examiners, under ordinary testing conditions, usually after the mother had decided to release the baby for adoption. The release was not contingent on the mother's test score and examinations were not made when the mother was ill or obviously upset emotionally.

Table 12 shows the distribution of the true-mother *IQ*'s and child *IQ*'s at a mean age of 13.6 based on the 1916 Stanford-Binet. This test was selected since it offered the maximum available degree of comparability for parent and child intelligence test scores. The mean *IQ* of these children

TABLE 12
COMPARISON BETWEEN DISTRIBUTION OF *IQ*'s (1916 STANFORD-BINET) OF TRUE MOTHERS AND THEIR CHILDREN

IQ	Mothers No.	Mothers %	Children No.	Children %
130-134	—	—	2	3
125-129	1	1	6	10
120-124	—	—	6	10
115-119	—	—	7	11
110-114	2	3	6	10
105-109	5	8	7	11
100-104	5	8	10	16
95- 99	6	10	8	13
90- 94	8	13	3	5
85- 89	7	11	3	5
80- 84	5	8	1	1
75- 79	8	13	1	1
70- 74	5	8	2	3
65- 69	5	8	1	1
60- 64	4	6	—	—
55- 59	—	—	—	—
50- 54	2	3	—	—
Number	63		63	
Mean	85.7		106	
Median	86.3		107	
Standard Deviation	15.75		15.10	

on the 1937 revision is 10 points higher than on the 1916 revision. If a correction were to be made for the *IQ*'s of the mothers, as some investigators have suggested, the 1937 test scores of the children would be used, with the same relative difference between the two arrays of scores.

A difference of 20 points between the means of mothers and children is not only a statistically reliable difference (*CR* 9.2) but is also of considerable social consequence.

Previous analysis (26) showed that there was no difference between the mean *IQ*'s of children whose mothers had been examined and those whose mothers' *IQ*'s were unknown. This was confirmed by examination of the present data (see Appendix).

Relationships between mother-child pairs, with regard to *IQ*, expressed in terms of correlation coefficients on 63 cases, are summarized in Table 13.

TABLE 13

Test I	.00±.09
Test II	.28±.08*
Test III	.35±.07**
Test IV (1916)	.38±.07**
Test IV (1937)	.44±.07**

*Reliable at the 5 per cent level of confidence (17, p. 212).
**Reliable at the 1 per cent level of confidence (Ibid.).

It is apparent that the above tabulation contains more questions than it answers and can be the source of considerable controversy. Certain conclusions can be drawn, however. Among these are the following: Test scores of children secured during the first two years of life bear no statistical relationship to the scores of their mothers, nor, it should be noted, do they show a very high relationship to their own later scores ($r = .35$). By seven years of age a substantial correlation with true mother's *IQ* is reached which remains of the same magnitude in adolescence provided the 1916 Stanford-Binet test is used with both children and mothers. The correlation is still further increased if the 1937 revision of the Binet is used.

Many reasons can and have been advanced for the low correlation between infant tests and later measures which will not be reviewed here. There is considerable evidence for the position that as a group these children received maximal stimulation in infancy with optimum security and affection following placement at an average of three months of age. The quality and amount of this stimulation during early childhood seemed to have little relation to the foster family's educational and cultural status.

The available data which can be statistically used—occupational classification and formal education—are not sufficiently sensitive to be useful in measuring these less tangible differences in child rearing practises. This point is important for the interpretation of the correlations between the child's *IQ* and his mother's *IQ* because it is possible to throw the weight of interpretation in the direction of either genetic or environmental determinants. If the former point of view is accepted, then the mother's mental level at the time of her examination is considered to reflect her fundamental genetic constitution, and ignores the effects of whatever environmental deprivations or advantages may have influenced her own mental development. Thus it would be assumed that the children of brighter mothers would in turn be brighter than the children of less capable mothers regardless of the type of foster home in which they were placed. The increasing correlation might be interpreted to support this point of view, since the occupational differences between foster parents are not large. It is, however, inconsistent with the evidence that the children's *IQ*'s substantially exceed those of their mothers and that none of them are mentally defective even though a number of the mothers were institutional residents. The rôle of the unknown fathers adds to the complication although the evidence indicates that the fathers resembled their unwed partners in mental level and education (1).

If the so-called environmental point of view is accepted, then the question is raised whether the increasing correlation between child and true

mother *IQ* possibly reflects the tendency to place the children of brighter mothers in the more outstanding foster homes, and the influence of these homes becomes increasingly prominent as the child grows older.

The question regarding selective placement can be approached in at least two ways. The first is an inspection of the relationships between such characteristics of the true and foster families as education and occupation. Using these crude measures, correlations of .24 between true mother *IQ* and foster parent education and .27 between true mother and foster parent education were found in this sample. Comparisons between true mother characteristics and foster father occupation for the present sampling are summarized in Table 14.

TABLE 14

	Foster father occupation					
	I	II	III	IV	V	VI
No. of foster fathers	14	17	27	29	2	5
Mean *IQ* of mothers of children in these homes	86	89	87	83	77	90
Number of cases	9	13	20	15	4	2
Mean education of mothers of children in these homes	10	10	10	8	8	8
Number of cases	12	16	28	25	9	2

It is apparent from both types of analyses that while a trend existed, selective placement, as evaluated by these measures was not consistently practiced.

Another approach to this problem of relationship is to examine the data for two contrasting groups of children. Selected for this purpose were: (*a*) Those children whose mothers were known to be mentally defective, with other evidence supporting the known *IQ* of under 70 ($N = 11$). (*b*) Those children whose mothers were above average in intelligence as measured by tests. Since there were only three cases above 110 *IQ*, the next five, in the 105-109 *IQ* range, were also included ($N = 8$).

Comparisons between the two groups are shown in Table 15. It is evident from the table that there is a marked difference between the intelligence and education of the true mothers of children in Groups (*a*) and (*b*). On the basis of education and occupation the foster parents of both groups are essentially similar, with perhaps a slight advantage for Group (*b*). On the first examination both groups of children were above average. By seven years of age a marked difference in mental level between the two groups is observable which persists into adolescence and is reflected by both the 1916 and 1937 Stanford-Binet tests. While children in Group (*a*) show average mental development as a group, the children in (*b*) show superior mental

TABLE 15

COMPARISONS BETWEEN CHILDREN OF MOTHERS OF INFERIOR AND OF ABOVE AVERAGE INTELLIGENCE

Case No.	True mother's *IQ*	True mother's Educ.	Foster mid-par. educ.	Foster father occup.	Child's *IQ* Test I	Test II	Test III	Test IV	Test IV '37
				Group A					
8B	64	8	16	I	126	125	114	96	106
10B	64	11	8	III	125	109	96	87	100
18B	65	8	9	VI	114	102	112	122	118
53G	63	8	13	III	127	121	119	101	111
54G	67	9	12	III	116	113	113	91	102
58G	54	8	13	III	117	114	119	98	113
60G	66	8	10	V	105	109	90	105	115
67G	65	6	12	IV	110	111	114	95	103
70G	63	1	10	II	110	113	107	101	118
76G	67	7	15	I	109	92	87	74	84
82G	53	3	12	IV	81	87	80	66	74
Mean	63	7	12	3.2	113	109	105	96	104
Median	64	8	12	III	114	111	96	96	106
				Group B					
17B	128	12	12	III	120	128	148	127	145
22B	109	13	11	III	102	107	113	108	130
57G	109	13	16	III	99	126	139	132	130
61G	109	13	15	II	112	113	125	128	135
71G	113	12	19	II	128	112	114	114	122
72G	110	12	8	VI	116	92	105	103	104
73G	105	8	9	IV	125	111	129	110	131
87G	109	13	11	III	128	145	125	119	133
Mean	111	12	12.5	3.3	116	117	125	118	129
Median	109	12.5	11.5	III	117	112.5	125	117	130

development. A difference of 25 points in *IQ* has significance socially, educationally, and vocationally.

If reliance were to be placed on these data alone, the inference would be fairly clear. However, comparison of the actual situation in the homes leads to a different conclusion. As a group, the homes of Group (*b*) are superior to the homes of Group (*a*) on every count on which homes can be evaluated. The average income of Group (*b*) is easily double the average income of Group (*a*) families. Five of the eight had sent their children to private schools, nursery schools, or camps for more than one year, reflecting an intelligent interest in superior opportunities, financial stability, and social status. None of the families in Group (*a*) had been either interested or able to afford similar opportunities. All the children in Group (*b*) had had music, dancing, or art lessons, while only 5 of the 11 in Group (*a*) had such training. In the number of books, the extent of participation in church, civic, social, recreational, and cultural organizations, participation in Child Study and *PTA* groups, familiarity with and application of approved child rearing practices and attitudes, the number of toys, school equipment, typewriters, personal radios, the degree of freedom in spending allowances, deciding recreation, hours to be kept and other factors now believed to be essential for optimum social and emotional adjustment, the homes in Group (*b*) were definitely superior to the homes in Group (*a*). The one exception was 72G. This was the home in which the foster mother had been hospitalized for mental illness. The foster father, well educated in a foreign country, is a railroad section supervisor. Finances are limited, intellectual interests are non-existent. For several years this girl has competently managed a household. It is possible to speculate that under more favorable circumstances she too, might have attained higher test scores.

The general conclusions which may be drawn indicate that while in this study an increasing correlation between child *IQ* and true mother *IQ* is observed with increasing age, it cannot be attributed to genetic determinants alone. A more sensitive measure of foster parental competence in child development is necessary before small sample techniques of comparisons and analyses of differences can be fruitful. The present measures of education and occupation do not evaluate the crucial differences between outstanding, average, or less effective homes. The fact remains that the children are considerably superior to their mothers in mental development. There is a socially important difference between a group of people whose average *IQ* is 107-117, depending on the test selected, and another group whose *IQ* is 87.

Since the mean for the children is above the average for the population as a whole, it cannot be attributed to the phenomenon of regression alone.

2. *Education*

In addition to the intelligence test scores there was information on the education of 92 of the true mothers. Recognizing that it was an unreliable and questionably valid measure of ability, nevertheless, correlations between true mothers' education and child *IQ* were computed. Table 16 summarizes the results.

TABLE 16

Test I	.04±.09
Test II	.31±.07*
Test III	.37±.06*
Test IV (1916)	.31±.06*
Test IV (1937)	.32±.06*

*Reliable at the 1 per cent level of confidence (17, p. 212).

Here, too, there was an increase in correlations between the first and second tests, but the relationships then became stationary instead of showing a further increase with subsequent tests. Recalling the still lower correlations between child *IQ* and foster parent education, here again it is advisable to guard against an inclination to over value the significance of correlations of this size.

3. *Occupation*

Since both the true mothers and true fathers of the children originated primarily from the two lowest occupational classifications, attempts to identify a relationship between the mental development of the children and the occupational ranking of the parents were fruitless. The occupational status of the true fathers was occasionally considered in placement plans, but usually the information was not felt to be sufficiently reliable to influence the decision.

Goodenough (8), Terman (29) and others have found that children living with their own parents in the two lower occupational categories have mean *IQ*'s of approximately 95. In contrast, children living with their own parents in the professional and managerial occupations have a mean *IQ* of approximately 115. It is apparent that foster children in adoptive homes of all the occupational levels represented here compare favorably with own children in homes of the upper socio-economic level, rather than following the pattern found in the families from which they originated.

F. Conclusions

Perhaps the most important contribution this study can make to the planning of future research is to point out the inadequacies of easily available data, and the necessity of formulating more clearly the various criteria used in the selection and assessment of the foster homes and the children. It is clear that the objective data used here, education and occupation, do not represent the real basis for selection and are not closely related to the child's mental development. Judging from the trend of correlations between mother's and child's *IQ*'s, one might conclude that a relationship exists which became increasingly apparent with age. This is complicated by the evidence of selective placement, yet without a parallel relationship between foster parent education and child *IQ*. This one set of figures must not be permitted to overshadow the more significant finding that the children are consistently and unmistakably superior to their natural parents and in fact, follow and improve upon the pattern of mental development found among own children in families like the foster families. What may be the salient features in the foster homes which have produced this development of the children, is only suggested in this study. It is inferred that maximum security, an environment rich in intellectual stimulation, a well balanced emotional relationship, intellectual agility on the part of the foster parents—all these and other factors contributed to the growth of the child. Unfortunately, there is still no scale for the measurement of these dynamic aspects of the foster home situation. The futility of arguments based on correlations involving measures of education and occupation applies to both sides of the discussion.

The conclusions which may be drawn from the material presented here suggest that:

1. The above average mental development of the children adopted in infancy has been maintained into early adolescence. There has been no large scale decline in *IQ* either for the group or for large segments of it, although certain children have shown either wide fluctuation or a steady decline or rise as compared with the first test results.

2. The educational or occupational data available for foster or natural parents in the typical social history record are not sufficient to predict the course of mental development of the children. Other factors, primarily emotional and personal, and probably located in the foster home, appear to have more significant influence in determining the mental growth of the children in this group.

3. The intellectual level of the children has remained consistently higher

than would have been predicted from the intellectual, educational, or socio-economic level of the true parents, and is equal to or surpasses the mental level of own children in environments similar to those which have been provided by the foster parents.

The implications for placing agencies justify a policy of early placement in adoptive homes offering emotional warmth and security in an above average educational and social setting.

TABLE 16
APPENDIX

Case number	Foster father's education	Foster father's occupation	Foster mother's education	True father's education	True father's occupation	True mother's education	True mother's *IQ*
1B	12	Farmer	12	8	Unknown	8	Unknown
2B	16	Minister	10	9	R.R. Man	9	100
3B	7	Electrician	10	Unknown	Unknown	7	71
4B	12	Gas Sta. Owner	13	13	Student	12	Unknown
5B	14	Farmer	14	Unknown	Truck Driver	12	89
6B	7	Farmer	7	11	Farm Hand	8	73
7B	12	Jeweler	16	Unknown	Unknown	8	Unknown
8B	18	H. S. Princ.	14	9	Unknown	8	64
9B	13	Accountant	12	13	Student	Unknown	Unknown
10B	8	RR Conductor	8	13	RR Wkr.	11	64
11B	13	Linotype Op.	13	7	Machinist	8	104
12B	18	Dentist	16	Unknown	Unknown	9	76
13B	8	Farmer	10	12	Road Labor	10	81
14B	8	Main.-Foreman	8	Unknown	Laborer	7	78
15B	13	Co-own. Store	14	15	Accountant	13	79
16B	15	Wholesale Sale	12	12	Unknown	8	Unknown
17B	12	Ins. Salesman	12	Unknown	Salesman	12	128
18B	8	RR Switchman	9	Unknown	Unknown	8	65
19B	12	Farmer	12	5	Farm Hand	9	71
20B	10	RR Mail Car.	12	Unknown	Elec. Power Plant	7	Unknown
21B	16	Dis. Mgr. Oil Co.	17	Unknown	Policeman	11	75
22B	9	Garage Mec.	13	12	Student	13	109
23B	10	Dept. St. Mgr.	12	Unknown	Constr. Lab.	12	Unknown
24B	15	Drug Salesman	16	Unknown	Laborer	Unknown	Unknown
25B	11	Garage Mec.	7	Unknown	Unknown	Unknown	Unknown

TABLE 16 (*continued*)

Case number	Foster father's education	Foster father's occupation	Foster mother's education	True father's education	True father's occupation	True mother's education	True mother's *IQ*
26B	8	Trucker	11	8	Sk. Laborer	6	Unknown
27B	12	Farmer	14	12	Greenhouse Wkr.	8	88
28B	8	Farmer	7	10	Cobbler	8	Unknown
29B	10	Farmer	13	16	Teacher	14	Unknown
30B	20	Physician	16	Unknown	Store Mgr.	10	Unknown
31B	9	Stoker Tender	11	Unknown	Farmer	Unknown	Unknown
32B	8	Farmer	14	6	Laborer	7	90
33B	20	Physician	15	12	Farmer	12	96
34B	15	Own. Feed St.	9	10	RR Worker	10	95
35B	18	Supt. Schools	15	12	Creamery Wk.	10	80
36B	18	Mayor & Store	8	Unknown	Clerk	12	Unknown
37B	12	Garage Mgr.	12	Unknown	Merchant	8	Unknown
38B	17	Farmer	16	11	Farm Labor	14	Unknown
39B	13	Dis. Mgr. T & T	13	Unknown	Unknown	8	102
40B	10	Farmer	6	10	Farm Labor	8	92
41G	8	Farmer	12	8	Odd Jobs	9	88
42G	8	Farmer	12	Unknown	Day Labor	12	100
43G	20	Physician	16	Unknown	Farm Labor	Unknown	Unknown
44G	13	Executive	14	14	Carpenter Hlpr.	12	91
45G	13	Executive	14	7	Carpenter Hlpr.	9	70
46G	13	Farmer	15	8	Laborer	11	84
47G	15	Auto Salesman	13	8	Farm Labor	8	78
48G	15	Auto Salesman	13	8	Farm Labor	8	78
49G	16	Editor	16	Unknown	Unknown	Unknown	Unknown
50G	16	Editor	16	12	Usher	12	87

TABLE 16 (*continued*)

Case number	Foster father's education	Foster father's occupation	Foster mother's education	True father's education	True father's occupation	True mother's education	True mother's *IQ*
51G	10	Butter Maker	10	7	Odd Jobs	7	Unknown
52G	13	Accountant	12	Unknown	Unknown	9	Unknown
53G	12	Grocer	15	Unknown	Unknown	8	63
54G	13	Service Mgr.	10	Unknown	Unknown	9	67
55G	13	Grocer	13	Unknown	Unknown	12	Unknown
56G	9	Engineer	15	5	Laborer	7	83
57G	16	OfficeClerk	16	Unknown	Unknown	13	109
58G	13	Produc. Clerk	13	8	Store Clerk	8	54
59G	8	Sander	12	12	Salesman	8	Unknown
60G	11	Syrup Maker	9	Unknown	Unknown	8	66
61G	16	Prop. Hatchery	13	12	Nursery Bus.	13	109
62G	8	Farmer	14	Unknown	Laborer	Unknown	Unknown
63G	15	Proprietor	12	Unknown	Unknown	12	88
64G	10	Window Trimmer	8	11	Unemployed	12	Unknown
65G	9	Garage Mec.	8	12	Farm Hand	12	95
66G	12	Farmer	13	6	Const. Gang	7	92
67G	8	Greenskeeper	15	Unknown	Unknown	6	65
68G	8	Ins. Salesman	12	14	Civil Eng.	12	Unknown
69G	12	Farmer	13	8	Foundry Wkr.	8	Unknown
70G	12	Ass't Emp. Mgr.	8	Unknown	Laborer	1	63
71G	18	Rl. Est. Broker	19	12	Laborer	12	113
72G	12	Section Foreman	4	8	Unknown	12	110
73G	8	Farmer	10	7	Unknown	8	105
74G	12	Office	16	Unknown	Farm Labor	12	96
75G	4	Farmer	12	Unknown	Unknown	8	78

TABLE 16 (*continued*)

Case number	Foster father's education	Foster father's occupation	Foster mother's education	True father's education	True father's occupation	True mother's education	True mother's *IQ*
76G	16	H. S. Teacher	14	8	Truck Driver	7	67
77G	13	Hardware	13	8	Farmer	13	Unknown
78G	16	Co. Engineer	16	11	Mechanic	9	80
79G	12	Farmer	16	12	Skilled Wkr.	11	Unknown
80G	16	H. S. Teacher	16	9	Unknown	11	Unknown
81G	8	Farmer	8	7	Truck Driver	11	Unknown
82G	11	Farmer	12	Unknown	Unknown	3	53
83G	8	Trucker	11	7	Laborer	11	Unknown
84G	12	Mailman	13	Unknown	Shoe Shop	8	74
85G	8	Cattle Trader	12	Unknown	Salesman	10	91
86G	13	Elec. Lineman	12	Unknown	Ins. Salesman	11	98
87G	9	Ret. Farmer	13	16	Eng. Student	13	109
88G	16	Veterinary	14	Unknown	Gas Station	12	92
89G	8	Poultry Sales	11	8	Laborer	10	91
90G	13	Auto Salesman	14	12	U. S. Navy	12	Unknown
91G	8	Road Grader	8	8	Auto Mechanic	8	Unknown
92G	17	Professional	16	11	Farmer	12	Unknown
93G	12	P. O. Clerk	11	12	R. Mail Carrier	12	88
94G	14	Executive	13	4	On relief	10	99
95G	8	R.R. Fireman	10	12	Truck Driver	11	90
96G	18	Supt. Schools	15	11	Farm Hand	12	104
97G	8	Hdwe. Salesman	12	Unknown	Farm Hand	9	Unknown
98G	8	Farmer	8	Unknown	Farm Hand	12	88
99G	12	Farmer	15	Unknown	Unknown	Unknown	Unknown
100G	15	Farmer	14	11	Mechanic	12	76

TABLE 17
APPENDIX (*continued*)

Case number	Age at examinations				*IQ* on examinations				
	1	2	3	4	1	2	3	4	4L
1B	1- 3	4- 1	6- 3	13- 3	121	114	115	105	115
2B	2- 5	4- 6	6- 5	13- 2	120	115	109	106	117
3B	1- 5	3- 8	6- 8	12- 7	131	109	113	95	106
4B	1- 7	4- 8	7-11	13-10	102	121	139	114	132
5B	1- 2	3- 4	6- 3	12- 3	126	115	113	90	99
6B	1- 4	3- 9	6- 2	13- 3	120	102	111	121	132
7B	1- 1	3- 8	6- 8	12-10	127	118	125	105	115
8B	1- 5	4- 5	6- 7	13- 8	126	125	114	96	106
9B	2- 5	4- 3	6- 9	13- 8	112	86	104	101	112
10B	2- 5	4- 9	7- 8	14- 1	125	109	96	87	100
11B	1- 6	4- 6	6- 7	13- 7	105	107	106	104	113
12B	0-11	2- 0	5- 3	11- 6	130	112	124	125	132
13B	1- 5	3- 4	6- 3	12- 5	107	120	109	115	118
14B	2- 5	4- 0	6- 4	13- 5	104	108	125	124	141
15B	1- 7	3-10	5-10	12- 8	120	117	114	109	114
16B	5- 7	7- 1	10- 5	16- 4	125	134	126	110	129
17B	2-11	4- 2	6- 3	13- 2	120	128	148	127	145
18B	2- 1	4- 3	6- 8	13- 9	114	102	112	122	118
19B	1- 5	3- 8	6- 7	12-10	122	100	128	119	120
20B	1- 7	3-10	6- 0	13- 0	120	113	114	101	113
21B	3- 1	5- 7	10- 7	16- 2	119	101	102	97	106
22B	3- 7	5- 7	8-10	15- 0	102	107	113	108	130
23B	3- 3	6- 4	8-10	15- 7	99	100	103	81	94
24B	3- 3	5- 2	8- 6	14- 5	118	113	122	109	123
25B	2- 6	4- 1	6- 6	13- 6	117	131	126	124	139
26B	1- 8	2- 8	5- 7	11- 7	134	130	115	100	111
27B	3- 6	5- 3	8- 3	14- 3	133	121	115	97	118
28B	1- 8	4- 4	6- 6	13- 6	103	87	103	110	121
29B	1- 7	3- 9	6- 8	12-10	105	116	125	118	122
30B	1- 1	4-11	6- 5	12- 5	141	95	105	98	106
31B	1-11	4- 9	8- 2	14- 1	99	95	92	88	104
32B	3- 2	5- 3	8- 2	14- 4	95	89	115	97	116
33B	2- 7	3-11	6-10	13- 9	82	106	105	105	109
34B	1- 7	4-11	7-10	13- 9	136	115	118	104	112
35B	3- 2	6- 1	8- 6	15- 6	104	107	107	96	113
36B	2- 0	4- 0	6- 3	13- 2	134	133	128	124	137
37B	1- 3	4- 7	6-10	13- 8	119	98	93	109	118
38B	2- 2	3- 9	6- 8	12-11	97	98	106	106	107
39B	1- 4	5- 8	8- 6	14- 5	119	103	101	86	101
40B	1- 7	3- 1	6- 0	12- 3	116	121	119	109	114
41G	4- 1	6- 9	9- 0	15- 9	90	94	95	77	90
42G	1- 4	4- 1	6- 3	13- 1	104	114	104	100	108
43G	2- 2	4- 2	7- 5	13- 2	125	124	116	127	134
44G	3- 0	4- 5	7- 8	13-10	99	102	128	126	142
45G	1- 4	2-10	6- 1	12- 3	135	112	118	118	124

TABLE 17 (*continued*)

Case number	Age at examinations 1	2	3	4	*IQ* on examinations 1	2	3	4	4L
46G	1- 3	2- 4	5- 2	11- 5	125	108	116	101	105
47G	1- 6	2- 6	6- 5	13- 5	102	90	99	73	78
48G	1- 6	2- 6	6- 5	13- 5	108	90	86	80	82
49G	3- 9	5-11	8-10	14- 9	116	115	130	116	138
50G	1- 3	3- 4	6- 3	12- 2	113	97	101	109	115
51G	2- 2	5- 1	8- 5	14- 5	115	108	112	89	99
52G	0-11	2- 8	5- 2	12- 1	135	113	97	107	102
53G	3- 5	5- 3	8- 6	14- 6	127	121	119	101	111
54G	1- 9	3-10	6- 8	12- 9	116	113	113	91	102
55G	2- 1	3- 9	6- 0	13- 0	135	142	142	123	131
56G	1- 6	4- 6	7- 9	13- 8	101	93	99	88	92
57G	1- 2	2- 7	5- 6	11- 8	99	126	139	132	130
58G	3-10	5-10	8- 0	14-11	117	114	119	98	113
59G	2- 5	4- 2	6- 8	13- 4	99	108	105	117	120
60G	1- 3	2- 3	5- 2	11- 4	105	109	90	105	115
61G	1- 3	2- 5	5- 4	11- 4	112	113	125	128	135
62G	6- 9	9- 4	12- 4	18- 6	112	106	101	110	133
63G	2- 4	4- 4	6- 4	13- 2	114	138	124	122	124
64G	2- 8	4- 7	6- 8	13- 5	120	120	120	123	129
65G	1- 3	3- 7	5-10	12- 9	140	130	126	118	125
66G	1- 1	2- 4	5- 3	11- 3	120	113	114	127	127
67G	3- 2	6- 2	9- 3	15- 0	110	111	114	95	103
68G	1-11	4- 0	6- 2	13- 2	151	146	132	141	152
69G	1- 6	4- 4	6- 5	13- 2	111	104	106	111	115
70G	4-10	7- 2	10- 2	16- 1	110	113	107	101	118
71G	1- 1	2- 4	5- 4	11- 4	128	112	114	114	122
72G	1- 6	4- 4	6- 6	13- 6	116	92	105	103	104
73G	2- 5	5-10	8- 9	14- 8	125	111	129	110	131
74G	1- 8	3-10	6- 1	13- 1	128	139	118	115	130
75G	2- 5	4- 5	6- 7	13- 7	138	125	139	116	123
76G	4- 2	7- 3	10- 6	16- 6	109	92	87	74	84
77G	1- 4	3- 1	6- 1	12- 3	136	130	141	121	130
78G	0-11	2- 0	5- 0	11- 3	109	112	127	131	139
79G	1- 6	4- 3	6- 1	13- 4	114	133	129	113	126
80G	2- 6	3-11	6- 4	13- 4	115	111	122	119	126
81G	2- 7	4- 3	6- 6	13- 6	89	94	95	79	80
82G	5- 7	7-10	10- 7	17- 2	81	87	80	66	74
83G	1-11	2-11	5-10	11-10	117	107	123	108	111
84G	2- 5	4- 2	6- 7	13- 8	121	132	132	113	120
85G	1- 6	3- 2	6- 3	12- 5	120	105	131	123	137
86G	1- 2	3- 1	6- 4	12- 6	142	135	147	123	137
87G	1- 3	3- 4	6- 3	12- 6	128	145	125	119	133
88G	2- 2	4- 7	7-11	14- 1	115	113	113	112	122
89G	1- 1	2- 8	4-11	11-10	105	130	115	111	123
90G	4- 9	7- 4	10- 3	16- 3	105	102	115	91	112

TABLE 17 (*continued*)

Case number	Age at examinations 1	2	3	4	*IQ* on examinations 1	2	3	4	4L
91G	1- 4	3- 8	6- 8	12- 9	127	100	103	90	101
92G	2- 6	3- 5	6- 6	12- 3	126	117	110	107	106
93G	1- 4	3- 5	5- 7	12- 4	112	107	110	103	116
94G	1- 1	3- 5	6- 5	12- 4	117	112	109	101	111
95G	1- 4	2- 4	5- 2	11- 5	122	127	129	126	143
96G	1- 3	4- 2	6- 7	13- 7	108	124	116	113	121
97G	2- 0	5- 1	8- 1	14- 2	113	105	109	97	104
98G	1- 3	3- 7	6- 3	12-11	122	112	119	94	106
99G	1- 4	2- 4	4- 7	11-10	128	102	113	117	123
100G	1- 6	3- 9	6- 8	12- 7	122	107	128	101	111

REFERENCES

1. ANDERSON, C. L., & SKEELS, H. M. A follow-up study on a small sampling of the putative fathers in Skodak's study. Unpublished study. Iowa Child Welfare Research Station. State University of Iowa, December, 1941.
2. BRADWAY, K. P. *IQ* constancy on the revised Stanford-Binet from the preschool to the Junior High School level. *J. Genet. Psychol.*, 1944, **65**, 197-217.
3. ————. An experimental study of factors associated with Stanford-Binet *IQ* changes from the preschool to the Junior High School. *J. Genet. Psychol.*, 1945, **66**, 107-128.
4. CUNNINGHAM, B. V. Infant *IQ* ratings evaluated after an interval of seven years. *J. Exper. Educ.*, 1934, **3**, 84-87.
5. DEXTER, E. S. The relation between occupation of parent and intelligence of children. *Sch. & Soc.*, 1923, **17**, 612-614.
6. DRISCOLL, G. P. The developmental status of the preschool child as a prognosis of future development. Teach. Coll., Columbia Univ., *Child Devel. Monog.*, 1933, No. 13. Pp. 111.
7. EBERT, E. H. A comparison of the original and revised Stanford-Binet scales. *J. of Psychol.*, 1941, **11**, 47-61.
8. GOODENOUGH, F. The relation of the intelligence of preschool children to the occupation of their fathers. *Amer. J. Psychol.*, 1928, **40**, 284-302.
9. GOODENOUGH, F. L., & ANDERSON, J. E. Experimental child Study. New York: Century, 1931. Pp. xii+546.
10. HALLOWELL, D. K. Stability of mental test ratings for preschool children. *J. Genet. Psychol.*, 1932, **40**, 406-421.
11. ————. Validity of mental tests for young children. *J. Genet. Psychol.*, 1941, **58**, 265-288.
12. HARMS, I. E., & SKEELS, H. M. Reported education and verified education of mothers of infants committed to the Iowa Soldiers' Orphans' Home during 1940. Unpublished study. Iowa Child Welfare Research Station, State University of Iowa, September, 1941.
13. HIRT, Z. I. Another study of retests with the 1916 Stanford-Binet Scale. *J. Genet. Psychol.*, 1945, **66**, 83-105.
14. HOAKLEY, Z. P. A comparison of the results of the Stanford and Terman-Merrill revisions of the Binet. *J. Appl. Psychol.*, 1940, **24**, 75-81.

15. LAYMAN, J. W. *IQ* changes in older-age children placed for foster-home care. *J. Genet. Psychol.,* 1942, **60**, 61-70.

16. LEAHY, A. M. A study of certain selective factors influencing prediction of the mental status of adopted children in nature-nurture research. *J. Genet. Psychol.,* 1932, **41**, 294-329.

17. LINDQUIST, E. F. Statistical Analysis in Educational Research. New York: Houghton Mifflin, 1940. Pp. xii+266.

18. MERRILL, M. A. The significance of *IQ*'s on the Revised Stanford-Binet Scales. *J. Educ. Psychol.,* 1938, 641-651.

19. National Society for the Study of Education: The Twenty-Seventh Yearbook of the National Society for the Study of Education. Nature and Nurture. Part I. Their Influence Upon Intelligence. Part II. Their Influence Upon Achievement. Bloomington, Ill.: Public School Publishing, 1928. Pp. ix+465, xv+397.

20. National Society for the Study of Education: The Thirty-Ninth Yearbook of the National Society for the Study of Education. Intelligence: Its Nature and Nurture. Part I. Comparative and Critical Exposition. Part II. Original Studies and Experiments. Bloomington, Ill.: Public School Publishing, 1940. Pp. xviii+471, xviii+409.

21. ROE, A., BURKS, B., & MITTELMANN, B. Adult adjustment of foster children of alcoholic and psychotic parentage and the influence of the foster home. *Quart. J. Stud. Alcohol,* 1945, No. 3. Pp. 164.

22. SATZMAN, S. The influence of social and economic background on Stanford-Binet performance. *J. Soc. Psychol.,* 1940, **12**, 71-81.

23. SCHMIDT, B. G. Changes in personal, social, and intellectual behavior of children originally classified as feebleminded. *Psychol. Monog.,* 1946, **60**, No. 5.

24. SKEELS, H. M. Mental development of children in foster homes. *J. Consult. Psychol.,* 1938, **2**, 33-43.

25. SKODAK, M. Children in Foster Homes. *Univ. Iowa Stud. Child Welf.,* 1939, **16**, No. 1. Pp. 156.

26. SKODAK, M., & SKEELS, H. A follow-up study of children in adoptive homes. *J. Genet. Psychol.,* 1945, **66**, 21-58.

27. SNYGG, D. The relation between the intelligence of mothers and of their children living in foster homes. *J. Genet. Psychol.,* 1938, **52**, 401-406.

28. SPEER, G. S. The intelligence of foster children. *J. Genet. Psychol.,* 1940, **57**, 49-55.

29. TERMAN, L. M., & MERRILL, M. A. Measuring Intelligence: A guide to the administration of the new revised Stanford-Binet tests of intelligence. Boston, Mass.: Houghton-Mifflin, 1937. Pp. xiv+461.

30. THEIS, S. VAN S. How foster children turn out. New York: New York State Charities Aid Assoc., 1924. Pp. 239.

31. WOODWORTH, R. S. Heredity and Environment. New York: Social Science Research Council Bulletin 47, 1941.

Personnel Counseling Service
Flint, Michigan

U. S. Public Health Service
San Francisco, California