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THE MENTAL DEVELOPMENT OF CHILDREN OF THE SAME IQ IN DIFFERING INSTITUTIONAL ENVIRONMENTS [1]

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THE PROBLEM

The concept of intelligence as fixed and unmodifiable, or only modifiable within very narrow limits, is yielding to a viewpoint which conceives of intelligence in more functional terms. No longer can it be said that an early intelligence test rigidly classifies a child for life in terms of mental potentialities. Rather, changes in functional mental performance are seen to be related to environmental differences. Recent studies, especially of children at the younger ages, have shown that these changes may be large in extent and appear to follow certain trends in relation to general environmental influences.

Studies of preschool and school age children by Wellman (4) and Skeels (3) have shown that groups of individuals at the mental levels below the central tendency of a population appear to gain on retests, while those at the upper levels tend to gain less or to lose in IQ. The factors responsible for these phenomena are difficult to understand. Do gains (or smaller losses) at the lower IQ levels of a population mean that the average sets the "stimulation level" for the group, tending thus to encourage those at the lower levels to greater attainment, while those in the upper categories are not challenged to attain their relative potentialities to a similar degree? Perhaps Sherman and Key (2) are right when they explain the general decreases in intelligence quotients of children in an isolated Virginia community as due to living in an environment which does not demand greater development. Do children develop only as the environment demands development? Or, applied in another way, does an environment "geared" to the average child of a population tend to stimulate more highly those individuals below the central tendency of the group, by demanding more of them, and fail to stimulate similarly those above the average? Do environments of differing mental levels show differences in these relationships?

If the mental level of an environment is an important factor

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in a child's mental development, then the rate of mental development of a child in an institution designed for normal and dull-normal children should vary from that of a child of similar mental ability in an institution designed for the feeble-minded. It is the aim of this study to investigate the mental development of children of the same mental level in relation to residence in institutional environments of differing mental levels.

SUBJECTS

The subjects for this investigation consist of children resident in four Iowa institutions: The Iowa Soldiers' Orphans' Home at Davenport, the State Juvenile Home at Toledo, the Institution for the Feeble-Minded at Glenwood, and the Hospital for Epileptics and School for Feeble-Minded at Woodward. The cases used were selected from a large number of children who had been given individual tests, and who were resident in these institutions between an initial test and one or more retests. Subjects who were over sixteen years of age at the time of the initial test or retest were eliminated so as to make all intelligence quotients computed on the basis of actual life age. No colored children, epileptics, physical anomalies, or cases at the idiot or low imbecile levels were included.

For convenience, the following key will be used in referring to these institutions:

Institution A: The Iowa Soldiers' Orphans' Home at Davenport.
Institution B: The State Juvenile Home at Toledo.
Institution X: The Institution for Feeble-Minded at Glenwood.
Institution Y: Hospital for Epileptics and School for Feeble-Minded at Woodward.

TESTS AND PROCEDURE

The Stanford and Kuhlmann revisions of the Binet scale were used for all individual tests. The use of the Kuhlmann, however, was limited to only a few younger children for whom a basal mental age of three years could not be obtained on the Stanford. All tests were administered by well-trained examiners as a part of the coöperative program between the Iowa Child Welfare Research Station and the Iowa Board of Control of State Institutions. These tests have been given at varying intervals during the last eight years.

The approach used in this study is the method of matched groups. In order to obtain as fine control as possible, three criteria were decided upon as the bases for selection in pairing:

1. Individuals must be within 3 points in IQ on initial test.
2. At the time of the first test, chronological age must not vary more than six months.
3. The length of intervals between the respective initial tests and retests must be within six months.

Various environmental comparisons were set up by pairing individuals in homes for dependents with children in institutions for the feeble-minded on these bases. Residents in the homes for dependents were paired not only with nontransfers in the schools for the feeble-minded, but also with children who had been previously transferred from the homes for dependents. In most cases only one individual was paired with another, but in some instances where the criteria were met, one individual might enter into two or more pairings. These cases were the exception rather than the rule. The following environmental groupings are compared in relation to mental development.

1. Residents at homes for dependent children, Institutions A and B, with nontransfers in schools for the feeble-minded, Institutions X and Y.
2. Residents at Institutions A and B with transfers from these institutions to Institution X.
3. Residents at Institution A with transfers from Institutions A and B to Institution Y.
4. Residents at Institution B with transfers from A and B to Y.
5. Total pairings of residents at Institutions A and B with transfers and nontransfers at Institutions X and Y by chronological age groupings (under six, seven to twelve, thirteen and over).
6. Total pairings of residents at Institutions A and B with transfers and nontransfers at Institutions X and Y.

Results and Conclusions

Analyses of these comparisons are presented below in two tabulations. In the first, children of the same IQ resident in environments of differing mental levels are studied on the bases of the various environmental groupings. In the second tabulation these pairings have been classified according to age groupings. The results of these analyses are as follows:

Matched Groups	Children	Net Changes in IQ			IQ	
		Mean	S.D.	S.E.M	Mean	Range
Residents at Institutions A and B	48	.5	6.0	.9	68.6	51 to 98
Residents at Institutions X and Y	48	-5.5	7.1	1.0	68.9	52 to 99
Residents at Institutions A and B	30	3.6	7.4	1.4	69.0	60 to 74
Transfers to Institution X	30	-4.7	7.3	1.3	68.9	61 to 73
Residents at Institution A	49	2.6	7.8	1.1	68.4	50 to 75
Transfers to Institution Y	49	-3.9	9.9	1.4	68.3	49 to 77
Residents at Institution B	39	1.7	5.7	.9	70.4	65 to 73
Transfers to Institution Y	39	-4.5	3.7	.6	70.1	63 to 73

Residents in Institutions A and B

Age Groupings	Children	Net Changes in IQ			IQ	
		Mean	S.D.	S.E.M	Mean	Range
Under six years	21	8.5	10.2	2.2	64.1	50 to 82
Seven to twelve years	76	.2	6.2	.7	70.3	56 to 98
Thirteen years and over	50	2.9	4.6	.7	68.2	59 to 73
Total all ages	147	2.3	7.0	.6	68.7	50 to 98

Residents and Transfers in Institutions X and Y

Age Groupings	Children	Net Changes in IQ			IQ	
		Mean	S.D.	S.E.M	Mean	Range
Under six years	21	-4.3	11.8	2.6	64.3	49 to 81
Seven to twelve years	76	-5.5	5.6	.6	70.3	55 to 99
Thirteen years and over	50	-4.2	3.3	.5	68.4	62 to 76
Total all ages	147	-4.9	7.8	.6	68.8	49 to 99

They may be summarized in the statements below:

1. When children at Institutions A and B are paired with nontransfers at Institutions X and Y, the orphanage children tend to remain constant while the children in the institution for the feeble-minded tend to lose. A significant difference of 6.0 IQ points is found between these paired groups. (Critical ratio, 4.5.)

2. Comparison of residents of the two homes for dependents (A and B) and transfers from these homes to an institution for feeble-minded (X) shows a difference of 8.3 points, and is statistically significant. (Critical ratio, 4.4.)

3. Residents at Institution A when paired with transfers from Institutions A and B to Institution Y indicate a significant difference (6.6 points) in favor of the orphanage group. (Critical ratio, 3.6.)

4. When children at Institution B are paired with children transferred from the two homes for dependents to Institution Y, a similar significant difference may be noted. (Difference, 6.2 points; critical ratio, 5.7.)

5. Regardless of age, the orphanage children continue to stay constant or gain while their pairs in schools for the feeble-minded tend to lose. In each case significant differences were obtained. (Differences, 12.8, 5.8, 7.1; respective critical ratios, 3.7, 6.1, 8.8.)

6. Throwing all individuals from the orphanages who entered into pairings into one group, and similarly combining all the paired individuals in the schools for the feeble-minded, a total of 147 pairs is obtained. In such a composite some pairs doubtless are entered several times. Their number is not large enough, however, to influence to any great extent the total effect. The results show a reliable mean gain of 2.3 IQ points for the orphanage children, while their pairs in schools for the feeble-minded show a mean loss of -4.9. The difference is significant. (Difference, 7.2; critical ratio, 8.5.)

These findings reveal a high degree of internal consistency. In every comparison there is a consistently significant difference between these carefully paired individuals in environments which

differ at least 30 IQ points in mental level. In not a single comparison do the means of the orphanage groups show a loss, while a loss is indicated in every mean for the groups in the institutions for the feeble-minded. It should be remembered that in the homes for dependents these children represent the lower mental levels of the population while in the schools for the feeble-minded those of similar IQ are in the higher strata. Seemingly, institutional environments of differing mental levels present unlike demands upon children of the same IQ, causing variations in the rate of mental development in accordance with the child's relative placement above or below the mental level of his environment. In other words it would appear that the average tends to set the "stimulation level" for the group, and children develop as the environment demands development. This conclusion is further substantiated in other findings in the larger study of which this investigation is a part (1).

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