

A DIFFERENTIAL DIAGNOSIS OF ORGANICITY IN MENTALLY HANDICAPPED CHILDREN

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Before the advent of social, cultural and psychometric considerations, definitions of mental deficiency focused upon physiological abnormalities (Clausen, 1967). One of the first scientific inquiries into the nature of retardation and its cause took place toward the end of the eighteenth century when Itard and Pinel considered nativistic and environmental influences surrounding Victor of Aveyron. Dispute concerning the nature and extent of these exogenous and endogenous influences upon retardation has prevailed since that time. With the development of the Binet as a test to indicate levels of intelligence, Pearson and Jaederholm (1914) described a subdivision of the range of subnormal intelligence when considering Binet scores of Swedish children considered to be feeble-minded. Although a very sizeable portion of the population's score fell within the Gaussian or "normal" curve, a small portion of "defectives" had measurements so low as to indicate they were certainly abnormal, having measurements not contained in the Gaussian form.

More recently, Zigler (1967) dichotomised mental retardation by making a distinction between those having known physiological defects responsible for their retardation, and those who reveal no such defects. The latter, and much larger group, Zigler labelled "familially retarded." The familially retarded group is considered an integral part of the gene pool of the general population. According to Zigler, intelligence is normally distributed with a mean of 100 and lower and upper limits of 50 and 150, respectively. Superimposed upon this curve Zigler represented the organically retarded as a second and separate population distribution with a mean IQ of approximately 35 and an IQ range from 0 to 70. A similar model has been proposed by Jensen (1970). Jensen has cautioned that the retarded population must not be envisaged as a homogeneous group. He has identified two basic categories of retardation - "primary" for the most part below 50 IQ and having physical abnormalities, and "secondary," including 75 percent of those in the 50 to 70 IQ range who appear clinically normal. In terms of both Zigler and Jensen there is a cross-over or overlap between the upper limits of the organic or primary group and the lower limits of the familial or secondary group.

Policies concerning the institutionalisation of retarded children appear to have evolved to include a distinction between etiologies of retardation that is compatible with the models postulated by Zigler (1967) and Jensen (1970). During the nineteenth and first half of the twentieth centuries family and community rejection of the retarded individual was sufficiently frequent that institutionalisation became accepted practice. In marked contrast, literature since 1950 argues that the preponderance of retarded individuals now being placed in institutional settings are the traditional "clinical" types, i.e., those manifesting physical abnormalities (Kirkland, 1967; Sabagh & Windle, 1960; Saenger, 1960). This trend notwithstanding, social and behavioural criteria continue as considerations in many institutional placements.

Given current institutionalisation policies, and the retardation models of Zigler (1976) and Jensen (1970), it should follow that the etiology of the retardation of institutionalised retardates is primarily organic while that of noninstitutionalised retardates is primarily familial. A sample that appears to provide an appropriate test for this argument is the group of retarded individuals having IQ scores in 50 to 70 range. The IQ level 50 marks the lower limit of the postulated familiarly retarded population distribution while the IQ level 70 marks the upper limit of the organically retarded distribution. The range between these values ostensibly includes both familiarly and organically retarded persons. This range also includes retarded persons from both institutional and noninstitutional environments. In terms of both Zigler's and Jensen's hypotheses, this range represents an overlap of the organic or primary group and the familial or secondary group. This overlap affords an opportunity to test the assumption about the nature of retardation that occurs in institutional and noninstitutional settings.

In accord with the postulated overlap of the two distributions, it was hypothesised that institutionalised and noninstitutionalised retarded children matched within the IQ range 50 to 70 comprise two distinct populations, namely, organic or primary in the institutional sample and familiar or secondary in the noninstitutional sample. Assuming institutionalised retardates with IQ scores less than 50 have a primary, organically-based etiology, the observation of organic impairment in the institutional sample would suggest that the retardation of the entire institutional population is primary in nature. Furthermore, if the noninstitutionalised sample were to display behaviour not in accord with an organic etiology, the trend cited in the literature to accommodate the familiarly retarded in the regular school system would be supported.

METHOD

Population

Fifty institutionalised and fifty noninstitutionalised retarded students participated in the investigation. Institutionalised children (CA range 125-222 mos.) met the following criteria: (a) were participating in the educational programme at the Red Deer Hospital School, Red Deer, Alberta, (b) were at a functional level in terms of sight and hearing, (c) had a measured Wechsler Intelligence Scale for Children (WISC) IQ in the 50 to 70 range. The noninstitutionalised children (CA range 122-216 mos.) were randomly selected from nine special classes for the mentally retarded of the Edmonton, Alberta school system. All children included met the same criteria as those specified for the institutionalised group.

Task

Each child was individually administered the Graham-Kendall Memory-for-Designs Test (MFD) in accord with the standardised procedures outlined for the test (Graham & Kendall, 1960). The ability of the MFD to identify brain-disordered people has been supported by several investigators (Graham & Kendall, 1960; Howard & Shoemaker, 1954; Lyle, 1968; Ritchie & Butler, 1964). As prescribed by Graham and Kendall (1960) a critical error score of twelve or greater was

employed as the cut-off point for inclusion in the brain-damaged category. Error scores less than twelve constituted the criterion for the non-brain-damaged classification.

Results

Performance means and standard deviations for the WISC and MFD are presented in Table 1. A preliminary test of the efficacy of the intelligence level matching procedure indicated that despite matching, the difference between the IQ means of the institutionalised and noninstitutionalised children was significant ($t = 2.84$, $df = 97.84$, $p < .005$, two-tail test). An analysis of covariance was subsequently conducted to statistically remove the variance attributable to intelligence differences (see Table 2). These analyses indicated that intelligence differences account for a significant part of the variance observed on the MFD ($F = 23.57$, $df = 1/97$, $p < .0001$). With this source of variation removed, performance differences on the MFD were still found to be significant ($F = 6.38$, $df = 1/97$, $p < .02$). Institutionalised children made a greater number of MFD errors than did comparable noninstitutionalised children ($t = 2.53$, $df = 97$, $p < .02$).

Group (a)	WISC		MFD	
	\bar{X}	S	\bar{X}	S
Institutionalised (b)	58.91	5.57	15.52	9.10
Noninstitutionalised	61.62	5.56	9.82	7.17

(a) $n = 50$ for each group.
 (b) CA Means and Standard Deviations for each group $\bar{X} = 170$ mos., $S = 27$ mos.

Source	SS	df	MS	F	p
IQ (Covariate)	1358.37	1	1358.37	23.57	.0001
Institutionalisation	367.53	1	367.53	6.38	.013

DISCUSSION

The significant difference between matched institutionalised and noninstitutionalised samples of retarded individuals on the MFD supports the distinction noted in the literature. The majority of institutionalised retarded children are those identified by the MFD as brain-damaged. This classification is compatible with both the "organic" classification of Zigler (1967) and the "primary" classification of Jensen (1970).

More specifically, the results obtained suggest that institutionalised children in the 50 to 70 IQ range represent the upward extension of the organically defective subpopulation. In contrast, noninstitutionalised children in the 50 to 70 IQ range appear to represent the lower end of the normal polygenic expression of intelligence that is said to represent secondary (Jensen, 1970) or familial (Zigler, 1967) retardation.

SUMMARY

Fifty institutionalised and fifty noninstitutionalised retarded children, matched on intelligence, were given the Graham-Kendall Memory-for-Designs Test (MFD) as a measure of organicity. The error scores of the institutionalised children on the MFD were significantly higher than were those of the noninstitutionalised group. The MFD results were interpreted in terms of the current trend to institutionalise organically-impaired retarded children and to accommodate familially retarded children in classes that are part of the regular school system.

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References

- Clausen, J. (1967). Mental deficiency: Development of a concept. *American Journal of Mental Deficiency*, 71, 727-745.
- Graham, F. K. & Kendall, B. S. (1960). Memory-for-Designs Test: Revised general manual. *Perceptual & Motor Skills*, 11, 147-188.
- Howard, A. & Shoemaker, D. J. (1954). An Evaluation of the Memory-for-Designs Test. *Journal of Consulting Psychology*, 18, 266.
- Jensen, A. R. (1970). A theory of primary and secondary familial retardation. In Ellis, N. R. (Ed.), *International Review of Research in Mental Retardation* (Vol.4). New York: Academic Press.
- Kirkland, M. H. (1967). Institutions for the retarded: Their place in the continuum of services. *Mental Retardation*, 5(2), 5-8.
- Lyle, J. G. (1968). Performance of retarded readers in the Memory-for-Designs Test. *Perceptual and Motor Skills*, 26, 851-854.
- Pearson, K. & Jaederholm, G. A. (1914). *On the continuity of mental defect*. London: Dulau.
- Ritchie, J. & Butler, A. (1964). Performance of retardates on the Memory-for-Designs Test. *Journal of Clinical Psychology*, 20, 108-110.
- Sabagh, G. & Windle, C. (1960). Recent trends in institutionalisation rates of mental defectives in the United States. *American Journal of Mental Deficiency*, 64, 618-624.
- Saenger, G. (1960). *Factors influencing the institutionalisation of mentally retarded individuals in New York City*. Albany, N.Y.: Interdepartmental Health Resources Board.
- Zigler, E. (1967). Familial mental retardation: A continuing dilemma. *Science*, 155, 292-297.