

## MENTAL RETARDATION, MENTAL AGE, AND LEARNING RATE

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Zigler's hypothesis that mental age (MA) and not IQ determines the rate of learning is examined in the light of empirical evidence comparing the learning rates of normal and retarded children and young adults matched for MA. The results show that learning rate is a function of IQ as well as of MA. In general, children of average IQ learned serial and paired-associate lists significantly faster than retarded young adults with IQs between 50 and 60 but with approximately the same MA as the children. An interaction between IQ, learning rate, and socioeconomic status is also noted.

Zigler has now stated (1967a) and restated (1967b) a central theme of his theoretical position regarding mental retardation that "...it is the MA [mental age] (level) and not the IQ (the relationship of MA to chronological age) that determines the exact nature, including the rate, of learning any task [1967b, p. 579]." Thus, two persons of different chronological age (CA) and different IQ but matched on MA should show similar learning rates.

Weir (1967) has challenged Zigler's statement on essentially the following basis: If MA is a measure of the knowledge an individual has accumulated by a given CA, the *rate* of acquisition of this knowledge is represented by the IQ, which is  $(MA/CA) \times 100$ . Therefore, contrary to Zigler's position, persons of the same MA but differing in IQ should show different rates of learning, even in short-term learning tasks. There is evidence that Weir's prediction is indeed borne out in the case of laboratory learning tasks.

The obscurities in the argument between Zigler and Weir can be overcome by making a conceptually clear-cut distinction between developmental rate and learning rate. There is much evidence (White, 1965) that mental abilities have a hierarchical structure, the development of which follows a chronological sequence; the milestones of this developmental sequence are marked by the increasing complexity of the cognitive structures (e.g., heuristics, symbolic mediators, strategies, information processing skills) which the individual can bring to bear on solving problems. The ages at which individuals attain these stages

of cognitive development are regarded as indexes of developmental rate. But two individuals who are at the same developmental stage and who have arrived at this stage at either the same or at different rates of development, may still differ in the rates at which they can acquire new information. This is distinguished as learning rate. Thus, individuals can be retarded or normal in developmental rate and retarded or normal in learning rate. Retardation in either realm will spell retardation as assessed by traditional intelligence tests, since these are a mixture of items that measure acquisition (e.g., vocabulary and general information subtests) and cognitive structures (e.g., problems involving logical reasoning). The  $2 \times 2$  combinations indicated by this formulation suggest three possible classifications of familial retardates. Normal developmental rate and normal learning rate are both necessary for the manifestation of normal intelligence, as traditionally defined; neither alone is sufficient.

Our data pertain only to the relationship of MA to learning rate. No inferences are made here concerning the issue of developmental rate.

Jensen (1965) matched 40 institutionalized mentally retarded young adults (mean IQ = 58) with no known organic defects with 40 normal school children (mean IQ = 105) on MA (9 years). In both serial and paired-associate rote learning, the normal children had learning rates some 3 to 4 times faster, on the average, than the adult retardates. Furthermore, although there was no significant differ-

ence in the standard deviations for MA in the two groups, the retardates showed a significantly greater standard deviation of learning scores than the normals. The greater heterogeneity of learning rates of groups of retardates as compared with normals, when the groups are equally homogeneous in IQ and MA, was further substantiated in a study comparing learning rates in retarded, average, and gifted children (Jensen, 1963). There are evidently more ways of being retarded than of being either average or gifted in mental ability.

Rohwer (1967) compared a group of 48 institutionalized familially retarded adults with groups of normal children in Head Start and kindergarten and in Grades 1, 3, and 6 on paired-associate learning. The children were sampled from populations of low- and middle-socioeconomic status (SES). (The MA is close to the CA for the school children, but is slightly lower in the low-SES groups.) The results, shown in Figure 1, indicate that the average learning score of the retardates is significantly lower than that of any of the other groups as well as being significantly lower than all the other groups combined ( $F = 103.22$ ,  $df = 1/396$ ,  $p < .01$ ). Comparison of the learning performance of the adult retardates and the middle-SES third graders is especially revealing, since the two groups have approximately the same MA (9.7 versus 9.6). Also, there was a larger standard deviation of learning scores in the retarded group than in any of the normal groups.

The relationship between learning rate and MA, at least in the mildly retarded (i.e., IQs of 50 to 75), is further complicated by socioeconomic status. Rapier (1968) closely matched Caucasian middle- and low-SES elementary school children ( $N = 20$  in each group) in classes for the retarded on CA (124 months), MA (88 months), and IQ (70). None of the Ss evinced any organic defects. The low-SES children showed consistently and significantly faster rates of paired-associate learning than the middle-SES children.

In view of the present results and consistent with our conceptualization, equivalence of developmental level need not

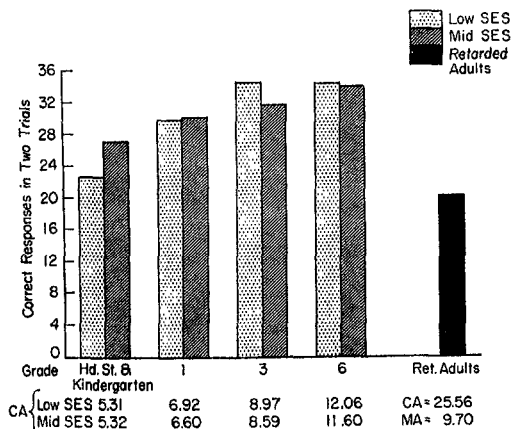


FIG. 1. Comparisons of low- and middle-socioeconomic groups of children at various grades in school with institutionalized retarded adults on paired-associate learning consisting of 24 picture pairs presented two times at a rate of 4 seconds per pair.  $N = 48$  in each of the nine groups.

imply equality of performance on intellectual tasks, specifically, learning tasks. When equal-MA comparisons involve normals and familial retardates, differences in learning rate are to be expected, and, indeed, are found.

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(Received September 11, 1967)