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Several case histories of hyperlexic children whose abilities in word recognition are at a level significantly higher than their general level of intellectual functioning are described, and the impact of such a condition on the child is suggested as an object of research. In the sever"l cases presented, the hyperlexia re"ulted in environmental stress. The potentiality of later stress is expected to take the form of anxiety provoked by unrealistic assessment of the child's abilities and by the high-level demands placed on him by teachers and parents. Several of the children described had been referred for testing as gifted children on the basis of word recognition ability alone, and one had been accelerated to a higher grade. One boy had not been detected as dyslexic until the fourth grade when it was found that although his word recognition was at grade level, his reasoning and comprehension abilities were similar to those of a high-level, educable mentally retarded child. This condition is often not detected earlier because of the emphasis on word recognition skills in the primary grades and because of the assumption of teachers and parents that if readingskills are high, other mental functioning should also be high. References are listed. (CM)

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CASE HISTORIES IN HYPERLEXIA[1]

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Hyperlexia is a term used to describe highly developed word reccgnition skills in children (N. Silberberg and M. Silberberg, 1967). As dyslexic children cannot recognize words, thus eliminating comprehension of the word, the hyperlexic child easily recognizes words which he is unable to comprehend. The authors felt that hyperlexia could be viewed "as a physiological variant" which is manifested in a "specific talent or group of talents independent of general intellectual functioning." Although the concept may be interesting to some as a theoretical construct, it is the impact of this condition on the child which is of critical importance. It is the purpose

of this paper to present some cases describing hyperlexic children with the assumption that, if teachers are aware of it, some of the problems typically encountered with these children may be avoided.

In describing hyperlexia, Silberberg and Silberberg (1967) proposed a continuum of reading ability which defines the relationship of word recognition skills to general verbal functioning. At one end of the continuum are the children usually labeled dyslexic, reading-disabled, remedial cases, etc. These are the children whose word recognition skills are significantly below their expected ability to comprehend. One can expect ten to thirty percent of the population to fall in this category (Gray, 1960), depending on the researcher's criterion of what constitutes the expected and actual levels of word recognition. Next on the continuum are the majority of children who learn to read normally and are not troubled by this experience. At the other end of the continuum is the group under consideration in this paper. These children are able to recognize words mechanically at a higher instructional level than indicated by their intellectual potential. In elementary grades, teachers often equate reading skills and intellectual functioning. The demands put on hyperlexic children are greater than they may be able to handle, due to the unrealistically high expectations, both by the

teachers and parents, based on the children's precocity in reading. The results of the child's inability to meet these expectations are environmental stress and an accompanying high level of anxiety.

It is unknown what percentage of children at any single age could be classified as hyperlexic children. Because of their success in reading, such children have been largely ignored. Newbrough and Kelley (1962) mention that five percent of their sixth grade population was two grades above expected level (on the basis of mental age) on the reading sections of a group achievement test. Since group reading tests involve many things besides word recognition, (e.g., intelligence, rate of reading, etc.), it is unknown whether a similar percentage would be obtained if an individual test of word recognition was used. One would suspect that the curve of discrepancy between actual and expected reading level is positively skewed. If the curve was ideally normal, neurological trauma (such as birth injury, etc.) would probably increase the frequency of cases at the negative end of the curve.

There is no universally accepted method of determining a child's expected reading level, nor a significant difference between observed and expected reading level. Other studies have based expectations on estimates of Reading Age and formulas which attempt to make adjustments on the basis of IQ (Bond and Tinker, 1957, p. 77). Since a Reading Age is not available on the instruments used in this study and the Bond-Tinker index is not practical for

the lower age levels, the tables in the WRAT Manual (Jastak and Jastak, 1965) were used. For a given child, the table was entered where the child's grade placement most closely approximated an equivalent IQ of 100. Within that table, the child's expected reading level was that which coincided with his measured IQ. This adjustment was necessary because the WRAT tables are based on chronological age, and the relationships between these chronological ages and the grade placements of the children in this study were not the same as those relationships presented in the tables.

Children are designated as hyperlexic if their reading score is one year above expected level in the first three grades and 1.5 years above expected word recognition level in the fourth, fifth, and sixth grades. Since it is unknown whether this condition persists through secondary school, standards have not been established for those children.

Several cases will be briefly presented to describe hyperlexic children and to speculate on some implications for each case.

A girl who was in grade 2.1 and whose age was 7-10 was referred for a psychological evaluation by her teacher because, although a good student and intelligent, she was evidencing difficulties in comprehension of directions. She was found to

have an IQ of 107 on the Stanford-Binet and a Wechsler Intelligence Scale Verbal IQ of 99. Her ability to recognize words was at the 4.8 grade level on the Wide Range Achievement Test and at the 4.2 grade level on the Gates Oral Paragraphs, but with poor comprehension. This little girl's reading skills had led the teacher to believe that she was above average in intelligence and had resulted in unrealistic expectations within the classroom. As so often happens, the teacher felt that her inability to comprehend as well as expected was due to "personality problems" and recommendations were made to the parents that they contact a local child guidance clinic. Intrinsic to this type of case is the assumption that, if reading skills are high, other mental functioning should also be high. Recognition on the teacher's and child guidance clinic's part that this need not be so could have eliminated the stress and guilt encountered by the child, her parents, and the teacher. No obvious reason was discerned for this child's ability specific to the recognition of letter configurations. On the other hand, no problems were observed in skills which could negatively affect her reading (e.g., visual perception, expressive language functioning, etc.).

Some children evidence particular strengths in one aspect of the reading process and efficiently utilize these strengths in word recognition. One boy

seemed exceptionally skillful in phonetic analysis and, in fourth grade, was reading right at grade level and was in the middle reading group. However, his teacher was concerned about his having "no comprehension . . . his reasoning is poor." The teacher was concerned, especially since his IQ on a group test (which was essentially a reading test) was 90. Evaluation with an individual IQ test revealed that he had a Verbal Scale IQ of 76, a Performance Scale IQ of 69, for a Full Scale IQ of 70. Upon consultation with his teacher, it was found that he had never been referred for psychological evaluation because he was not that "bad" a problem in earlier grades where the development of word recognition skills constitute the most important component of the instructional program. The teacher's descriptions of his reasoning and comprehension abilities, as demonstrated in class, were similar to those of a high-level educable mentally retarded child, but he was being treated as a child of normal intelligence only because he could recognize words well.

Another child had specific skills in a phonic approach to reading which masked her real problems. She was a three year old girl referred to a psychological clinic because the parents thought she was gifted. They felt that the extreme degree of her giftedness accounted for her unusual behavior. Their opinion was based on the fact that she had been able to "read" since the

age of eighteen months. It was observed that she was able to sound out almost any word presented to her. However, much of this reading was manifested in an unusual way. For example, she often read in a perseverative manner. One incident was told concerning her reading herself to sleep by continuously reading a soap bar wrapper over and over again. When she was brought in, evaluation was impossible because of her behavior. Many of the symptoms exhibited caused the psychologist to suspect infantile autism and she was then referred for further study. It is interesting that, among the approximately thirty cases encountered by the authors, three were diagnosed as autistic and a disproportionately high number were evidencing behaviors typically associated with neurological dysfunction.

In the last two cases presented, a specific perceptual or language skill which is highly correlated with reading success seemed to underlie the child's ability to recognize words above the level expected from other information. Usually it is assumed that reading is a summation of these skills rather than a correlate, and that proficiency in these skills is essential to the reading act. However, the authors have seen several cases in which the children performed quite poorly on standardized instruments which purport to measure these perceptual and language skills and yet they were able to recognize words quite well. One boy, a second grader, was

tested independently by two psychologists and was found to have an IQ of 64. His speech and expressive language was poorly developed. His visual-motor coordination, as measured by the Draw-A-Man and Bender Gestalt tests, was significantly poorer than that of average children of his age. His auditory discrimination was not exceptionally well developed. In spite of these poorly developed perceptual skills, he was able to recognize words on the third grade level, a full grade above placement. Of course, his comprehension of what he read was commensurate with his measured intelligence.

The problem which can result from a specific skill in reading occurs on the other end of the intellectual continuum as well. One youngster was in grade 3.3 at the time of evaluation. His chronological age was 8-2. Chronologically, he should have been in second grade but had been accelerated to third grade by the school staff two weeks before the evaluation. His second grade teacher's referral stated that "his reading ability is far above grade level (3.97 on Gates Reading at beginning of year). He is excellent in spelling and can spell third grade words without difficulty." This boy was administered the Wechsler Intelligence Scale for Children and found to have a Verbal Scale IQ of 116 and a Performance Scale IQ of 104, for a Full Scale IQ of 112. On the Wide Range Achievement Test, he was found to be recognizing words at the 5.7 grade level and

spelling at the 5.2 grade level. This case illustrates the classroom teacher's mistaken opinion, because of the heavy emphasis on reading in the primary grades, that a bright normal youngster was gifted. By fourth grade he was beginning to have difficulties with his academic work. It is likely that his future teachers will have expectations that he will perform as an accelerated child. The importance of the teaching of reading reduces toward the end of elementary school and through the secondary school, where abstract thinking, given a minimally good reading ability, becomes more critical to academic success. A child such as the last one described could conceivably find himself in an anxiety-provoking situation, trying to compete academically with older and more academically talented children.

The stress which often accompanies hyperlexia may be a function of the individual child's perception of his environment. One third grade boy had a Verbal Scale IQ of 115, a Performance Scale IQ of 108, for a Full Scale IQ of 113, but was able to recognize words at the eighth grade level, due to what appeared to be an excellent visual approach to word analysis. Like many hyperlexic children, his spelling skills were at a lower level than his reading skills, but still above grade placement, and his arithmetic achievement was at grade level. It became obvious during the examination that he was very insecure about his "being smart." Although achieving near or at the top

of his class in reading skills, he presented the picture of a highly competitive child who does not lose easily. Competition with more gifted children resulted in the development of adjustment problems in the classroom, especially directed at children whose learning came more easily. Despite his constant bravado, this child behaved much in the same way as a child with a reading problem; that is, attempting to draw attention away from what he preceived as a non-acceptable school performance. He preferred instead to focus attention on his behavior in the hope of distracting others from the reality of his not being as successful a student as he could claim on the basis of his reading skills.

SUMMARY AND CONCLUSIONS

Owing to the great interest in the professional literature in children with reading disabilities, the other end of the distribution has been largely ignored. This paper described several cases of children called hyperlexic, whose abilities in word recognition are at a level significantly higher than their general level of intellectual functioning. It might be well to consider the possibility that learning the mechanics of word recognition may be dependent upon a specific talent or group of talents apart from the general level of language functioning. Since most human traits which are measurable distribute themselves normally, one would expect that measurements based on a discrepancy score between two of these traits would also distribute themselves in a fairly normal fashion, probably in this case with a positive skew as a result of physiological and environmental factors. Therefore, depending on what portion of the continuum one would designate as "significantly" above expected level, a certain percentage of young children exist with the characteristic of "reading" better than one would expect, considering their intelligence quotient and grade placement.

It is not the existence of such a trait which needs investigation. Rather, it is the impact of such a condition on the child which should be the object of research. Conceivably,

some children exist who would fall under the rubric of hyperlexia, and yet this condition has caused them no problem. It must be noted that the cases described above were encountered in the practice of school psychology. It is therefore conceivable that our small sample does not represent all children who can recognize words in a precocious manner, but only represents children for whom this condition was upsetting. Presently, attempts are being made to locate other cases to determine whether there are some hyperlexic children who have no problems in school adjustment, and whether the necessary adjustments in instructional materials cause administrative difficulties. In addition, follow-up of the cases presented here is currently under way to determine whether this condition persists beyond the primary grades and, if so, how long. It is conceivable that this specific ability to recognize words tends to become more in line with the normal rate of development as the child matures.

In the several cases presented here, some elementary school children evaluated by the authors during the past few years appeared able to mechanically recognize words on a level significantly higher than their ability to integrate language. This condition resulted, in these cases, in environmental stress. The potentiality of later stress is expected to take the form of anxiety provoked by unrealistic assessment of

their abilities and the high level of demands placed on them by teachers and parents. It would seem that merely making teachers aware of the situation and its implications might reduce the stress put on these children and be beneficial to the educative process.

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