PARENTAL ESTIMATES OF CHILDREN'S RECEPTIVE VOCABULARY

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Samples of 13 mothers and fathers of normal preschool children and 11 mothers of high-risk preschool children estimated their children's vocabulary ability by predicting their child's responses to individual PPVT-R items and by making a global rating of their child's vocabulary ability. Prior to the parental estimations, the children had been administered the PPVT-R. Accuracy of parental estimates, as measured by d', was low, although the mothers' average estimates were significantly higher than zero and higher than fathers' estimates. Accuracy of estimation was similar for mothers of normal preschoolers and for mothers of high-risk preschoolers. Time spent reading to the child, mothers' employment, and children's ability level were not related to parental accuracy. Although correlations between the children's scores and parental estimates all were significant, parents tended to overestimate their children's abilities by approximately 9 to 10 points on the average. Overall, parental estimates of their children's vocabulary ability, using a global rating scale, provide a somewhat useful measure for placing their children in a broad classification range.

There are occasions when clinicians must rely on parental estimates of their child's level of ability, particularly when the child is severely handicapped and untestable. Previous research has focused primarily on parental estimates of intellectual functioning of their retarded or handicapped children. Studies that had mothers state the age at which they believed their child was functioning indicate that the resulting estimates are generally accurate (Ewert & Green, 1957; Heriot & Schmickel, 1967; Schulman & Stern, 1959; Tew, Laurence, & Samuel, 1974), although small overestimations do occur (Heriot & Schmickel, 1967). Correlations between maternal estimates and child's obtained score range from .50 to .67.

When mothers are asked to predict or rate their child's performance on specific test items from a standardized ability test, the results are more variable. While Saxon (1976) and Roman (1980) found that mothers were accurate in assessing their normal child's level of functioning, Cottler and Shoemaker (1969) reported that mothers of gifted children significantly underestimated their children's level of functioning. Gorelick and Sandhu (1967) found that mothers of retarded children significantly overestimated their children's IQ, although the mothers' mean estimated IQ was still within the retarded range. Capobianco and Knox (1964) found that fathers' mean estimate of IQ was not significantly different from their retarded children's mean score, while mothers' mean estimate represented a significant overestimation, although still in the retarded range. Correlations in the above studies ranged from .61 to .86.

The methodology of some of the research studies cited above is questionable. In some studies (Ewert & Green, 1957; Schulman & Stern, 1959), the Vineland Social Maturity Scale was improperly used as an indicator of intellectual functioning. In other studies, more than one test was used to determine the IQ (Ewert & Green, 1957; Schulman & Stern, 1959) or different tests were used to compute IQs in the same sample

(Ewert & Green, 1957; Heriot & Schmickel, 1967; Schulman & Stern, 1959). Further-more, in two studies some parents rated their child's performance on one test while the child was tested on a different test (Gorelick & Sandhu, 1967; Saxon, 1976).

Previous research has neglected studies that focus on item-by-item comparisons of parental estimates of test responses and children's actual test responses. Global estimates of functioning, however derived, do not lend themselves to evaluation of parents' ability to predict their children's responses on specific test items. Parental estimates and actual scores could be equivalent, though based on a different pattern of success and failure. In the present study, the same test items were used for both children and their parents. The focus was on receptive vocabulary, as measured by the Peabody Picture Vocabulary Test-Revised (PPVT-R) (Dunn & Dunn, 1981), rather than on intelligence. Both item-by-item comparisons and global estimates were evaluated.

METHOD

Subjects

The subjects in Sample 1 were parents (both mothers and fathers) of 13 children in a university-based preschool who volunteered to participate with their children in the study. Except for two fathers, who were seen in their offices, all children and parents were tested at the preschool.

The children, 3 girls and 10 boys, ranged in age from 3.10 to 4.11 years, with a mean age of 4.2 years. The mothers' ages ranged from 28 to 39 years, with a mean age of 35 years. Five of the mothers were employed in some capacity outside the home, while eight were full-time homemakers. All of the mothers had graduated from high school, and all but one had some college education. The fathers' ages ranged from 32 to 56 years, with a mean age of 36 years, and all were college graduates.

In Sample 2, there were 11 mothers and their children who were seen as part of a follow-up study of high-risk infants. At birth, the children, 5 boys and 6 girls, ranging in age from 5.0 to 5.5 years, with a mean age of 5.2 years, had medical complications, such as asphyxia or apnea, or had low birth weight. The mothers' ages ranged from 24 to 48, with a mean age of 31.7 years. Eight were employed outside the home and three were full-time homemakers. All mothers had completed high school; five had completed some college.

Procedure

The children were individually administered the PPVT-R (Form M). After the child had completed testing, the parents individually participated in the study. In all cases, parents were interviewed within two weeks of the child's testing.

The parents were asked to complete three tasks, which took approximately 15 minutes. First, they were given the same PPVT-R items as their child had been given and were asked to state whether or not their child could correctly identify the picture of the presented word when shown the PPVT-R plate of four pictures. They were requested to indicate a "yes" or a "no." Second, they were asked to rate their child's vocabulary ability in comparison to other children of the same age. This was done by providing them with a 27.5 cm rating scale that ranged in seven equal marked increments from "Very Much Below Average" to "Very Much Above Average" and having them place an "X" anywhere on the scale line. By measuring where on the line the parent placed the "X" and counting the number of incremental points registered, an estimate of vocabulary ability was determined as a standard score from 55 to 145. Third, the parents were asked

to complete a short questionnaire regarding their family constellation, socioeconomic status, and amount of time spent reading to the child who was in the study.

Dependent Measures

For the children, the PPVT-R standard score was the dependent measure. For the parents, three dependent measures were obtained. One measure was a derived PPVT-R standard score (similar to that obtained for the children) based on the number of *yes* responses to the PPVT-R items. This score provides a general estimate of vocabulary ability. The number of *yes* responses (or raw score) was converted to a standard score using the PPVT-R norms table. All *yes* responses were tallied, regardless of their accuracy. A second measure was based on item-by-item accuracy. From signal detection theory, d', an index that takes into account response bias, was computed (Elliott, 1964). This measure provides a precise estimate of accuracy. The third measure was a global rating of vocabulary ability, based on the rating scale.

RESULTS AND DISCUSSION

Table 1 summarizes the data from Sample 1 (university preschool). It shows the means and standard deviations for the: (a) children's PPVT-R standard scores, (b) derived PPVT-R standard scores based on mothers' *yes* responses to individual items, (c) derived PPVT-R standard scores based on fathers' *yes* responses to individual items, (d) standard scores based on mothers' global vocabulary rating, and (e) standard scores based on fathers' global vocabulary rating. A one-way repeated measures ANOVA on these five scores revealed a significant main effect, $F(4,48)=2.74$, $p<.05$. A Newman-Keuls test indicated that only the mothers' and fathers' global mean ratings, based on the rating scale, were significant overestimations of the children's performance (*M*s 119.31, 118.92, and 109.00, respectively).

Intercorrelations between the five measures also are shown in Table 1. All correlations were highly significant, ranging from .61 to .96. The highest correlations with the children's scores were for the individual item estimates of the mothers and fathers

Table 1
Intercorrelations Between PPVT-R Standard Scores for Children and for Parental Estimates of Receptive Vocabulary Ability in University School Sample

Variable	1	2	3	4	5
1. Children's PPVT-R standard score	—	.96***	.93***	.61*	.79**
2. Derived PPVT-R scores based on mothers' *yes* responses		—	.92***	.63*	.79**
3. Derived PPVT-R scores based on fathers' *yes* responses			—	.68**	.84***
4. Mothers' global vocabulary rating				—	.62*
5. Fathers' global vocabulary rating					—
M	109.00	114.31	115.69	119.31	118.92
SD	18.36	20.07	17.92	20.66	16.82

Note. There were 13 children, 13 mothers, and 13 fathers.
  *$p<.05$.
 **$p<.01$.
***$p<.001$.

($r=.96$ and .94, respectively), followed by the correlation between the mothers' and fathers' individual item estimates ($r=.92$).

Comparison of item-by-item responses yielded a mean d' for mothers of .58 and a mean d' for fathers of .20. A t-test revealed that mothers were significantly more accurate in estimating item responses than would be expected by chance ($t=4.198, p<.01$). However, fathers responded no better than chance ($t=1.389, p<.05$). A t-test, using d', indicated that mean item accuracy was similar for mothers and fathers, $t(1,24)=1.87$, $p<.05$.

For Sample 2 (high-risk children), the following data were obtained: (a) children's PPVT-R standard scores, $M=104.45$ ($SD=13.33$); (b) derived PPVT-R standard scores based on mothers' *yes* responses to individual items, $M=106.91$ ($SD=16.10$); (c) standard scores based on mothers' global vocabulary rating, $M=113.18$ ($SD=13.69$). A one-way repeated measures ANOVA on these three measures revealed a significant main effect, $F(2,20)=5.54$, $p<.05$. A Newman-Keuls test revealed that the mothers' mean global rating was a significant overestimation of both the children's mean achieved score and the mothers' mean derived standard score.

Intercorrelations between the three measures all were significant. The correlation between the children's PPVT-R scores and the derived PPVT-R scores from mothers' *yes* responses was $r=.92$ ($p<.001$); the correlation between the children's PPVT-R scores and the standard scores based on mothers' global rating of vocabulary ability was $r=.86$ ($p<.001$); the correlation between the derived PPVT-R scores from mothers' *yes* responses and the standard scores based on mothers' global vocabulary rating was $r=.69$ ($p<.05$). The highest correlations were between the children's PPVT-R scores and the two estimates obtained from the mothers.

Comparison of item-by-item responses yielded a mean d' for mothers of the high-risk group of .56. A t-test revealed that these mothers were also significantly more accurate in estimating item responses than would be expected by chance ($t=2.615, p<.05$).

Comparison of item-by-item accuracy for the university school mothers with the high-risk study mothers revealed no significant differences between the two groups, $t(1,22)=.17$, $p<.05$; therefore, data from both groups of mothers were combined for further analysis.

Factors that might be related to accuracy were evaluated: specifically, the child's vocabulary ability, time spent reading to the child, and maternal employment. Because of the homogeneity of the samples, child's age, socioeconomic status, and parental education were not studied. The child's vocabulary ability (standard score) was not significantly related either to maternal ($r=-.19$) or paternal ($r=-.26$) accuracy. In addition, neither time spent reading to the child ($r=-.01$ for mothers, $N=24$; $r=-.44$ for fathers, $N=13$) nor mothers' employment (0: not employed, 1: employed; $r=.08$, $N=24$) were related to item accuracy.

The results do not provide a clear-cut answer to the question of how accurate parents are in judging their children's vocabulary ability. The most sensitive index of accuracy, d', was not large in either sample (.58 for mothers of normal children, .56 for mothers of high-risk children, and .20 for fathers of normal children). The absolute values of these mean d's indicate that the accuracy of the parents in judging individual items was relatively low, although it was significantly different from zero for both samples of mothers. Fathers' accuracy, on the other hand, was not significantly different from zero.

Even though the standard scores obtained from the number of *yes* responses given by the parents were not based on the accuracy of the response, the correlations between these and the children's standard scores were extremely high for all parental groups. It seems that parents have some ability to estimate the absolute number of words a child knows, even though they do not always know the specific words known by the child.

The mean global estimates of vocabulary ability based on the rating scale were in every group significant *overestimates* of the children's performance. These estimates were 10 points higher for both mothers and fathers in the normal group, and 9 points higher for mothers of high-risk children. Thus, parents of both normal and high-risk children are likely to overestimate their child's vocabulary ability when asked to do so in a global way. Nevertheless, the results suggest that a rating scale used to obtain global parental estimates may be somewhat useful in obtaining a range that accurately reflects the child's level of vocabulary ability.

Unfortunately, the results do not provide any clues as to what factors might be related to parental accuracy. Of those that were studied—time spent reading to the child, mothers' employment, and child's ability level—none were related to parental accuracy. Future research with more diversified groups may provide information about variables related to parental accuracy in judging their child's vocabulary ability. This is especially so because the present study did not include low-functioning children.

REFERENCES

CAPOBIANCO, R. J., & KNOX, S. (1964). IQ estimates and the index of marital integration. *American Journal of Mental Deficiency, 68,* 718-721.

COTTLER, S., & SHOEMAKER, D. J. (1969). The accuracy of mothers' reports. *Journal of Genetic Psychology, 114,* 97-107.

DUNN, L. M., & DUNN, L. M. (1981). *Peabody Picture Vocabulary Test-Revised.* Circle Pines, MN: American Guidance Service.

ELLIOTT, P. B. (1964). Appendix 1—Tables of *d'*. In J. A. Swets, *Signal detection and recognition by human observers.* New York: Wiley.

EWERT, J. C., & GREEN, M. W. (1957). Conditions associated with the mother's estimate of the ability of her retarded child. *American Journal of Mental Deficiency, 62,* 521-533.

GORELICK, M. C., & SANDHU, M. (1967). Parental perception of retarded child's intelligence. *Personnel and Guidance Journal, 46,* 382-384.

HERIOT, J. T., & SCHMICKEL, G. A. (1967). Maternal estimate of IQ in children evaluated for learning potential. *American Journal of Mental Deficiency, 71,* 920-924.

ROMAN, V. P. (1980). The relationship between language ages of preschool children derived from a parent informant scale and language ages derived from tests administered directly to the preschool child. *Language, Speech, and Hearing Services in the Schools, 11,* 50-55.

SAXON, S. A. (1976). Using mothers to screen for intelligence. *Journal of Pediatric Psychology, 3,* 28-29.

SCHULMAN, J. L., & STERN, S. (1959). Parent's estimate of the intelligence of retarded children. *American Journal of Mental Deficiency, 63,* 696-698.

TEW, B., LAURENCE, K. M., & SAMUEL, P. (1974). Parental estimates of the intelligence of their physically handicapped child. *Developmental Medicine and Child Neurology, 16,* 494-500.