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TWO TESTS OF PERCEPTUAL-MOTOR FUNCTION, THE DRAW-A-PERSON AND THE BENDER-GESTALT.

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THE DRAW-A-PERSON AND THE BENDER-GESTALT TESTS WERE ADMINISTERED TO A GROUP OF SIBLINGS PARTICIPATING IN A STUDY OF LEARNING DISABILITY. THE SIBLINGS WERE DIVIDED INTO FOUR GROUPS OF SUBJECTS--EDUCATIONALLY HANDICAPPED (EH), SUCCESSFUL ACADEMIC (SA) CONTROLS, EDUCATIONALLY HANDICAPPED SIBLINGS (EHS), AND SUCCESSFUL ACADEMIC SIBLINGS (SAS) CONTROLS. ALTHOUGH THE TESTS ARE FELT TO BE SIMILAR IN THAT THEY REQUIRE MOTOR ACTIVITY AND SOME DRAWING SKILL, THE BENDER IS MORE STIMULUS-BOUND, IS GEOMETRIC RATHER THAN HUMAN, AND INVOLVES IMMEDIATE PERCEPTION RATHER THAN MEMORY FUNCTIONING. NEVERTHELESS, BOTH SCALES SHOWED AN APPRECIABLE DIFFERENCE BETWEEN THE EH AND SA CHILDREN. THE EHS AND SAS GROUPS SCORED IN PATTERNS CLOSE TO THAT OF THEIR RELATED SIBLINGS. THE TESTS WERE SCORED BY FOUR DIFFERENT METHODS AND THE RESULTS REMAINED CONSISTENT. ANALYSES OF THE DATA OBTAINED FROM THESE TESTS SUGGEST THAT THE PROBLEM OF THE EH GROUPS DOES NOT LIE IN AN INABILITY TO SEE CORRECTLY. HOWEVER SOME OF THEIR PROBLEMS COULD BE SOLVED BY DISCRIMINATION TRAINING. THIS PAPER WAS PREPARED FOR PRESENTATION AT THE SRCD MEETINGS IN NEW YORK, MARCH 31, 1967. (DK)

Two Tests of Perceptual-Motor Function: The Draw-A-Person and the Bender-Gestalt.

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Today I want to report on the tests for perceptual-motor function given the four groups of children in the sibling study of learning disability. But before talking about the actual data, I'd like to say something about the tests themselves.

Perceptual-motor functioning is a very complex process. So far, no one conceptual model has been exclusively successful in describing exactly what goes on between a stimulus and a response. Until the process has been precisely described, and tests designed accordingly, no one will have any way of knowing where along the line a malfunction occurs. Tests of perception must be free of the requirement of reproduction before we can be sure it is a perceptual and not a motor function we are measuring; on the other hand, equivalence of perception must be established before we can be sure it is a motor and not a perceptual function we are measuring.

Most tests in use today are global, and tell us little that is useful in locating the area of malfunction when malfunction exists. They are not infallible diagnostic instruments in any one single case. But used in a statistical study of many children, these tests do discriminate between groups of children who are functioning well, and those who are functioning poorly, on a perceptual-motor level.

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The two tests I wish to talk about today have been widely used over a long period of time, and are particularly suited to children because of their simplicity. You are probably familiar with them both: The Draw-A-Person and the Bender-Gestalt.

Both tests require motor activity for their performance, and some measure of drawing skill. Beyond this, the tests are quite different. The Draw-A-Person is relatively stimulus-free, the Bender relatively stimulus-bound. In the request to draw a person, the model is not specified, and the child probably works more from memories accumulated over a long period of time rather than immediate perception. The form involved in the Draw-A-Person is human, as opposed to the geometric designs on the Bender cards, and for this reason may be more subject to the influence of affect. I've seen many children get angry at people, seldom if ever at a triangle!

As for interpretation of the Draw-A-Person as a reflection of self-image rather than perceptual-motor functioning, the experience of this study has made me doubtful that the person drawn is always a picture of the child himself. For response to the question "What can you tell me about the person in the picture?" varied from "It's me.", through an objective description of the person drawn, to "It's you." or "It's my brother Jim.". This is not to say that children do not express themselves in their drawings. Apparently they do. In this study, at least, the drawings made by children with learning problems were markedly inferior to the drawings made by children doing well in school, as scored by two different but highly objective scoring systems. One, the Harris

Point Scale, has over seventy items to be checked in judging a drawing, and has been well standardized. The other scale is of our own devising, and of unknown reliability and validity. On the basis that there might be two common reactions to academic failure, helplessness and anger, 57 appropriate indicators were selected from the much longer list compiled by Urban. Many of the indicators thought clinically useful also appear in the Harris Point Scale, which interprets the Draw-A-Person as a measure of intellectual maturity. Other items are unique to each scoring system.

Both scales showed an appreciable difference between the learning disability children and the achieving control group (the red and the blue). The secondary groups score in a pattern close to that of their related siblings, orange close to red, green close to blue. Difference between the sibs of the learning disability children and the sibs of achieving children was also significant. But no significant difference could be demonstrated between the learning disability children and their own sibs, or the achieving children and their own sibs. (See Figure I.)

Both scoring systems produced similar results, although the Reaction Indicator Scale produced differences of greater magnitude. The two parts of the Reaction Indicator Scale, helplessness and anger, operated equally well whether used separately or combined, although they proved independent of one another by correlation (EH rho=.007,n.s.; SA rho=-.15,n.s.).

The Bender-Gestalt test probably probes different aspects of perceptual-motor function than the Draw-A-Person. The form is

geometric rather than human, a specific model is present for referral at any time during the copying, and performance is more a matter of reproduction than production. Although the Bender probably relies more on immediate memory and contextual cues than the Draw-A-Person, the patterns of scores from both tests are strikingly similar. Again, similarity between sibs and difference between sib groups was demonstrated. (See Figure II.)

As with the Draw-A-Person, several scoring systems were used to evaluate the Bender protocols. All groups were scored by the Koppitz Developmental Scoring System and by a revision of this system. The revised scale permitted scoring for finer errors of rotation and integration, a logical procedure since most of the children in the study were beyond the age when only gross irregularities could be expected to differentiate between groups.

Two other scoring systems were used: the Koppitz method of scoring for emotional disturbance and the Bender-de Hirsch system of scoring reported in a recent study of reading disability. Confused order is an item common to both systems, and, in both, this item makes a major contribution to the difference found between educationally handicapped and successful children in this study. A second attempt at drawing, an item not scored by other systems, contributes even more to the significant differences found when protocols were scored by the Koppitz method of scoring for emotional disturbance.

All four scoring systems produced a significant difference between the children with learning difficulty and those without. Both the original and the revised Koppitz Developmental Scoring

System also showed significant difference between the two groups of siblings, although Koppitz scoring for emotional disturbance did not. When the Revised Koppitz System was used, the level of significance reached was appreciably higher than when other methods of scoring were used, probably because this scale picked up more errors in the older children. However, because the Koppitz Developmental Scoring System without revision did pick up differences between these groups of children, in spite of having been designed with a younger age group in mind, and is a published and well known system, all subsequent discussion of results will refer to this system of scoring.

In considering errors made in reproduction of Bender designs, errors may be counted by card or by type. By card, both groups had the greatest difficulty with the intersecting hexagons of card seven, but the arrowhead of card three produced the greatest difference between the children with learning problems and those without. When classified under the four types of errors of the Koppitz System, Distortion, Rotation, Integration, and Perseveration, only Distortion yielded a significant difference when protocols were compared by separate category.

Distorion was also the dominant criterion by which the children judged their own drawings. After each child had drawn all nine designs, he was again shown each card in order and asked whether his reproduction was the same or different from the one on the card. Only seven of the seventy-six children in the learning disability group, and only eight in the control group, confined their criticism to the nominal compliance of "the same" or

"different". Almost all responses could be classified into the categories of the Koppitz System, and discrepancies of size and shape (distortion errors) were noted far more frequently than other types of errors.

Apparently children are more critical of their drawings than psychologists, for as judged same or different by card, the learning disability children called over twice as many of their drawings "different" as had been scored for error. The successful children were almost as critical, and overall, as tested by Chi-square, there was no significant difference between groups. The older the children were, the more critical of their drawings they were, and the older children with learning problems were more critical of their drawings than the older successful children. When related to scored difference, the learning disability children showed no less accuracy of discrimination than their achieving peers. Both groups judged about half their drawings correctly according to scoring, and there is no significant difference between groups ($\chi^2 = 1.05$, n.s.). (See Table I)

Another way of judging the accuracy of discrimination is to ask whether the learning disability children were any more or less precise in their recognition of errors, when errors had been scored, than the successful children. Successful children might be expected to be more perceptive than learning disability children, and to judge their reproductions "different" for the same category of error as that for which the drawing had been scored. But such is not the case. In fact, the errors observed by the learning disability children more often fell into the

category of error for which the drawing had been scored, than did the errors noted by the successful children. But the difference is not significant ($\chi^2 = 1.28$, n.s.). The successful children did mention the specific error for which a reproduction had been scored in error slightly more often than children with learning problems, but again the difference does not reach significance ($\chi^2 = 0.36$, n.s.). (See Table II)

Now, accuracy of discrimination, in comparing a completed copy with an original design, may be quite a different task than perceiving the design correctly prior to production. This data can in no way be interpreted to mean that the child did in fact perceive the card correctly prior to production. But the data does suggest that for the children with learning problems in this sample at least the trouble does not lie in a basic inability to see correctly.

If this is so, and repeated use of an inquiry following Bender performance should substantiate these findings, an important doubt about children who have trouble learning to read and write may be removed from the long list of possible causes of poor perceptual-motor functioning in learning disability children. Although they may not use their ability well, apparently they do not lack the ability to discriminate forms accurately when their attention is drawn to the problem. Discrimination training may help them make better use of their perceptual ability, and this is a hopeful note. These results are in no way conclusive, of course, but they are provocative, and exciting.

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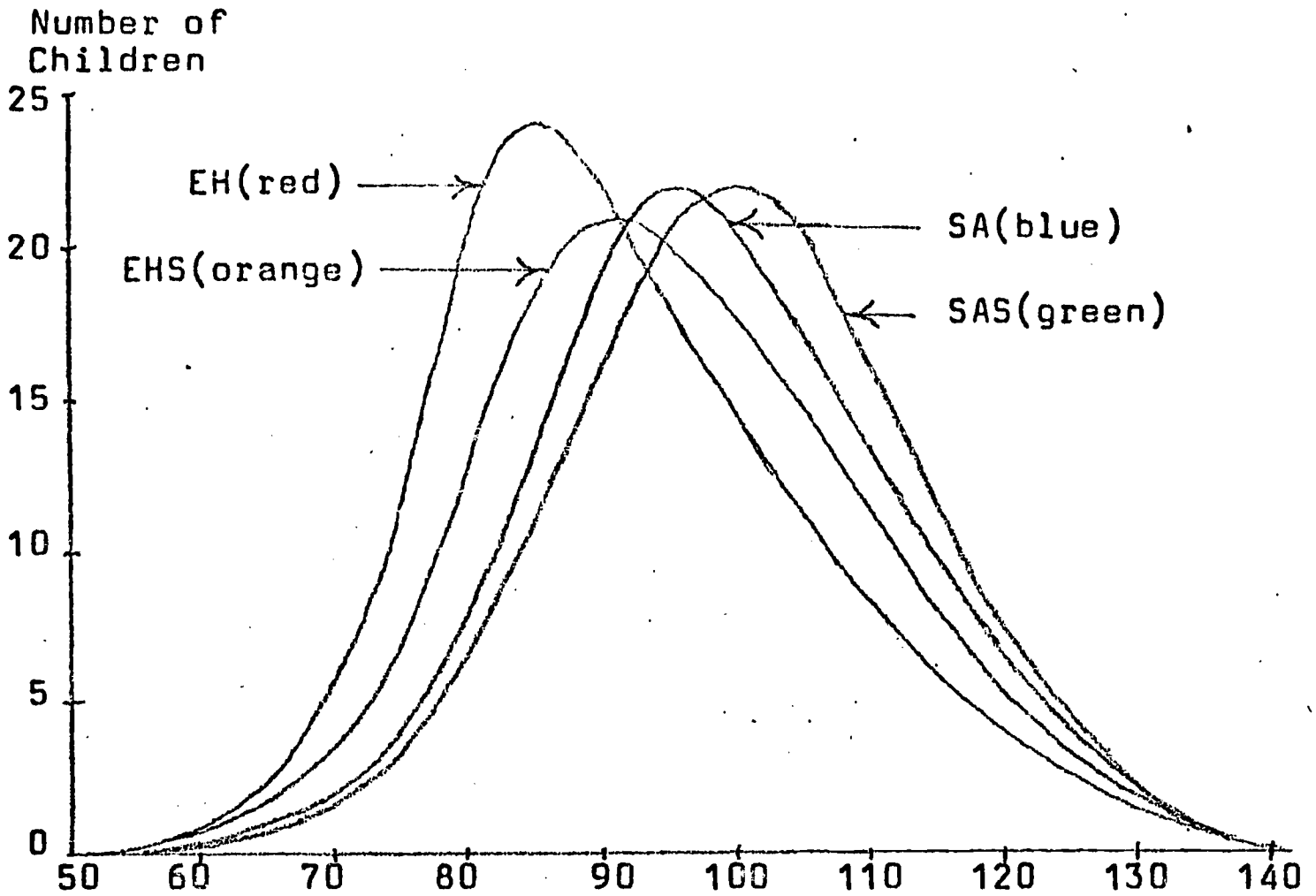
Figure I

DRAW-A-PERSON



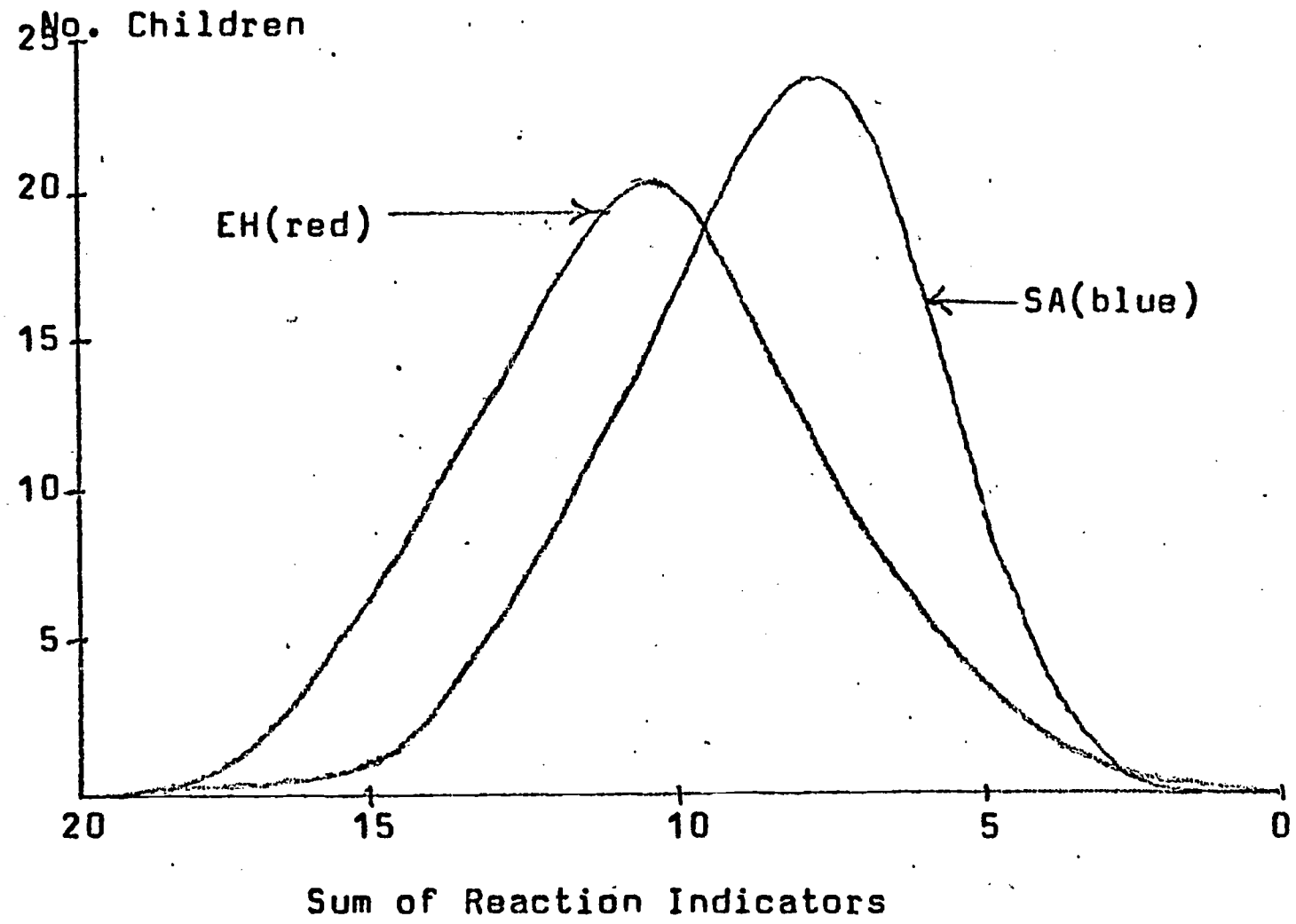


Figure II

BENDER-GESTALT

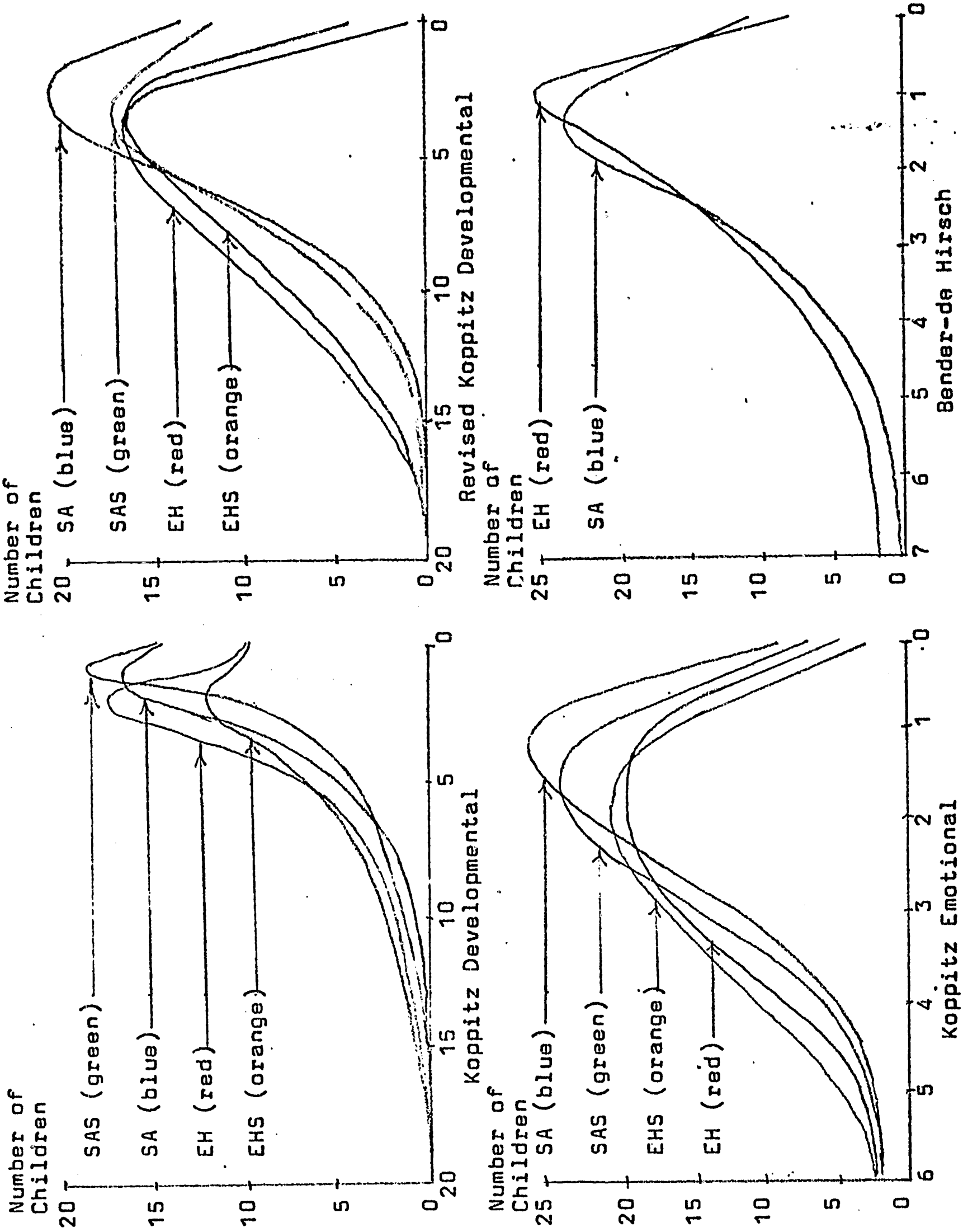
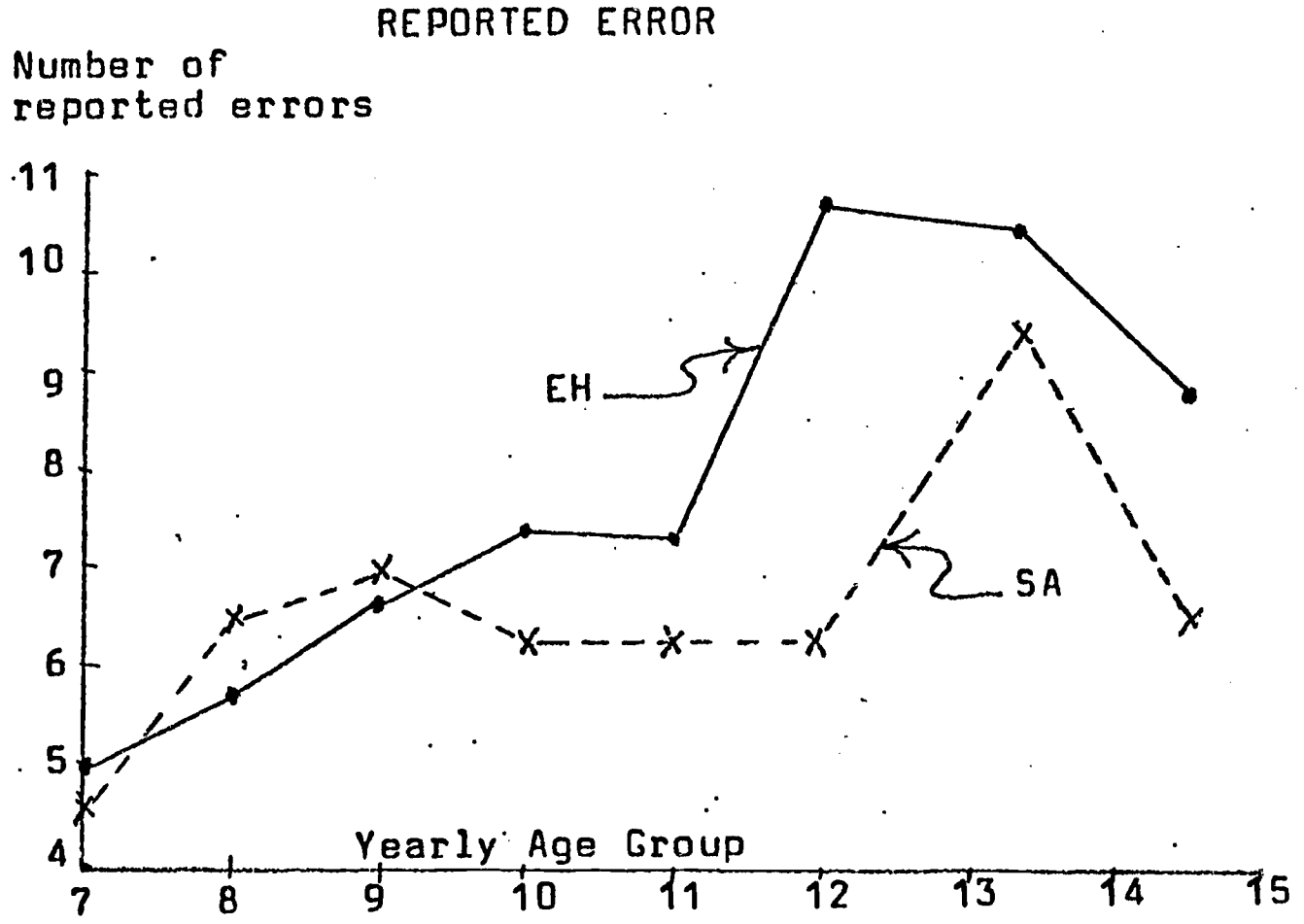


TABLE I

BENDER-GESTALT

	EH	SA
Total number reproductions	684	684
Reproductions judged same	200	243
Reproductions judged different	484	441
Reproductions scored for error	207	156
Reproductions not scored for error	477	528

REPORTED ERROR



REPORTED ERROR RELATED TO SCORED ERROR

		EH		SA	
Proportion	Difference Recognized / Error Scored	158/207	76%	114/156	73%
Proportion	Similarity Recognized / No score for error	151/477	24%	201/528	27%

TABLE II
BENDER-GESTALT
CONGRUENCE OF REPORTED AND SCORED ERRORS

BY CATEGORY

	EH		SA	
Proportion $\frac{\text{Reported Error}}{\text{Scored Error}}$ in same category	$\frac{110}{158}$	70%	$\frac{74}{114}$	65%
Proportion $\frac{\text{Reported Error}}{\text{Scored Error}}$ in different category	$\frac{48}{158}$	30%	$\frac{40}{114}$	35%

BY SPECIFIC ERROR

	EH		SA	
Proportion $\frac{\text{Specific Error Mentioned}}{\text{Reported and Scored as Different}}$	$\frac{67}{158}$	42%	$\frac{54}{114}$	47%
Proportion $\frac{\text{Specific Error Not Mentioned}}{\text{Reported and Scored as Different}}$	$\frac{91}{158}$	58%	$\frac{60}{114}$	53%