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Thomas F. Vance
Iowa State College

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THE EFFECT OF SIZE OF PEG AND FORM BOARDS
UPON THE PERFORMANCE SCORES OF
YOUNG CHILDREN ¹

THOMAS F. VANCE

Sylvester,⁽³⁾ in 1913, characterized the form board test as one that "appeals to the child's interest, affording him a short and fascinating task which calls for his best effort and helps to free him from the fear and self-consciousness which often interfere seriously in a mental examination." The inclusion of the form board test in certain well-known scales and its serving as the basis of a number of extensive studies bear testimony to the truth of Sylvester's evaluation. Further study of the form-board may thus be justified on the basis that a still greater refinement in technique may be attainable.

Believing that a somewhat smaller Seguin board than the one used in the Stutsman⁽²⁾ scale would be better for use with small children, the writer constructed a board having somewhat smaller proportions. The use of this board with nursery school children lent support to the opinion that the reduction in size made an appreciable difference in the score. The purpose of the present study has been to determine whether there was any justification for such an opinion.

The copious literature on the form-board has little to say with respect to size. Sylvester⁽³⁾ constructed a Twitmyer adaption, scaled down to two-thirds the size of the original, which he used in his preliminary studies. The time was found to be practically the same for the two boards, the original and the adaptation, though the smaller one was thought to have some advantage in that children could reach the corners more easily. He concluded that this was perhaps more than offset by the finer coordinations required for fitting the blocks into their places.

In their report of the Worcester Form Board series, in 1925, Shakow and Kent⁽¹⁾ hold that the advantages of the larger over the smaller boards, except for subjects of low grade mentality, are negligible as compared with the convenience of the smaller boards for clinical use.

¹ Presented at the meeting of Iowa Academy of Science, April, 1932, Cedar Falls, Ia.

Young,⁽⁶⁾ who gave both the large Sylvester-Seguín and the smaller Witmer board to a number of subjects, found that the latter was almost invariably preferred.

Wallin⁽⁴⁾ states, with respect to the peg boards, that his aim was to make the pegs so large that they could be grasped easily and handled by hands incapable of delicate coordination. He adds that his aim has been successfully realized, for the most part, but that some of his subjects had great difficulty in grasping and inserting the pegs. Larger pegs were suggested as a remedy for this.

There are three phases of the investigation that we are here reporting⁽⁵⁾: 1. Variation in the size of the Wallin Peg A with the pegs all of the same size; 2. variation in the size of the pegs with the boards of the same size; and 3. variation in the size of the Seguin board with the blocks and recesses scaled proportional to the size of the board. In each instance, there were three sizes; small, medium and large.

In the first part the size of the Wallin boards were, respectively, 3.7 x 17.8 cm., 7.5 x 35.5 cm., and 15.3 x 53.2. The dimensions of the second board are those of the standard Wallin board. The holes in the small and the large boards were spaced proportional to the size of the board, being 2.8 cm. from center to center in the small one and 8.8 cm. in the large one. Holes are spaced 5.5 cm. apart in the standard board.

In the second part, the pegs varied as follows: small, .4 cm. in diameter; medium, .9 cm., the standard peg; and large, 1.8 cm. They were all of the same length, 6.3 cm., which is the length used by Wallin.

In the third part, the dimensions of the small Seguin board were 15.4 x 24.3 cm.; of the medium, 25.3 x 40.6 cm.; and of the large, 35.5 x 56.9 cm.

The subjects consisted of 137 nursery school and kindergarten children who ranged in age from 24 to 78 months.

In every case, the boards were presented according to the Merrill-Palmer technique. The order of presentation was such that each board was given first, second, and third places an equal number of times to equalize the practice effect.

Table. Wallin and Seguin Boards — Average Time for 137 Children

	SMALL	MEDIUM	LARGE
Wallin, Size of Board	12.4	11.2	11.7
Wallin, Size of Peg	12.5	10.5	10.2
Seguin	43.3	45.1	51.7

It appears from the table that the advantage is with the medium

size Wallin Peg Board which happens to be the standard size. However, the difference between the small and the medium sizes may be due partially to the greater stability of the standard board. Because of the lighter weight of the small board it was more easily shifted about on the table as the pegs were being inserted. When the age range from 24 to 78 months is divided into ten approximately equal age levels, eight of these levels show a preference for the board of standard size.

The results suggest that the smallest pegs cannot be manipulated as easily as the larger ones. The difference between the small and the standard is probably great enough to be significant.

It appears, further, that the children do the smallest Seguin board more rapidly than the two larger ones.

Out of 375 errors with all three Seguin boards, 128 were with the small board; 139, with the medium board; and 108, with the large one. Sixty-two per cent of the total errors were made in attempting to put the diamond block into the hexagon recess. The writer is of the opinion that a part of the difficulty with the diamond and the hexagon is due to the position of the diamond in the peripheral visual field where the recess is not so readily seen. Hence, the persistent attempt to put it into the hexagon which resembles it more closely than the other blocks. It is also more difficult for the child to see the diamond recess because he tends to cover it with his right arm as he is replacing the blocks.

It would seem that a smaller board might tend to reduce this error. As a matter of fact, this error was distributed among the three boards as follows: small, 50; medium, 62; and large, 55. When put on the basis of the percentage of total error for each board: 39, 45 and 51 per cent, respectively, were obtained. This illustrated that the diamond offers somewhat less difficulty with the smaller board.

A larger number of cases would make the study more complete and the results more conclusive. The high standard deviations indicate that the results are not statistically significant. The more extended study might make a comparison of the first trials in each case significant. Practical issues, however, would not seem to warrant an extension of the project; an opinion voiced by Sylvester in 1913 but not followed by subsequent students of the form board.

The Stutsman procedure presents the board three times to each subject. To use the boards that could be done in the least amount of time would amount to so small a saving that it would not be worth considering. Mere bulk of performance test material, how-

ever, is a matter that may well be taken into account. For this reason the smaller board is to be preferred, as it easily may be slipped into a brief case and it is of interest to know that the children solve this board more quickly than they do the larger ones.

The differences in times, though small, may justify the conclusions that in the making of performance test material a sufficient amount of preliminary investigation should be conducted to determine the optimal size of the piece for the purpose for which it is being designed.

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DEPARTMENT OF PSYCHOLOGY,
IOWA STATE COLLEGE,
AMES, IOWA.