

1951

Age and Sex Difference in Performance in the O'Connor Blocks

R. N. Kjerland
Iowa State College

Let us know how access to this document benefits you

Copyright ©1951 Iowa Academy of Science, Inc.

Follow this and additional works at: <https://scholarworks.uni.edu/pias>

Recommended Citation

Kjerland, R. N. (1951) "Age and Sex Difference in Performance in the O'Connor Blocks," *Proceedings of the Iowa Academy of Science*, 58(1), 371-374.

Available at: <https://scholarworks.uni.edu/pias/vol58/iss1/46>

This Research is brought to you for free and open access by the IAS Journals & Newsletters at UNI ScholarWorks. It has been accepted for inclusion in Proceedings of the Iowa Academy of Science by an authorized editor of UNI ScholarWorks. For more information, please contact scholarworks@uni.edu.

Offensive Materials Statement: Materials located in UNI ScholarWorks come from a broad range of sources and time periods. Some of these materials may contain offensive stereotypes, ideas, visuals, or language.

Age and Sex Difference in Performance in the O'Connor Blocks

By R. N. KJERLAND

THE PROBLEM

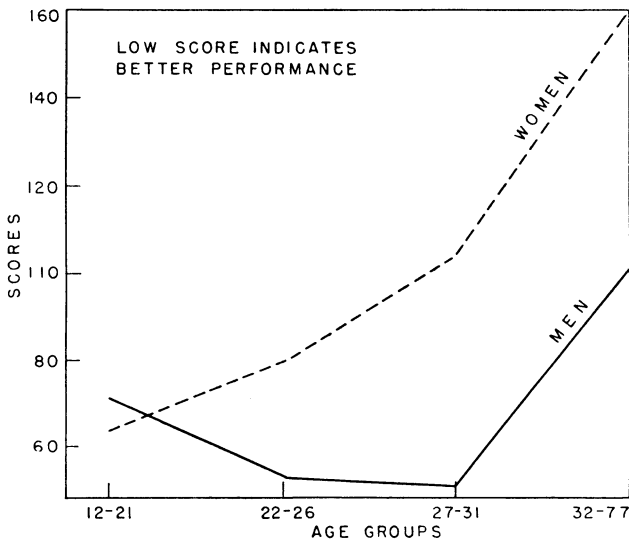
Kean and O'Connor (1927) reported the use of the O'Connor Blocks as a measure of mechanical aptitude. A study of the data indicated that superior performance was associated with a type of analysis characteristic of engineers and mechanics..

In recent years the test has been used to some extent in the field of driver training and driver aptitude measurement. A study reported by Miller and Lauer (1946) with a group consisting largely of Oriental students gave low positive correlation with driving performance. The criterion used was not as reliable as the experimenters desired.

According to Harrell (1940) the factor loadings of the O'Connor Block test run as follows: perceptual, .230; verbal, —.50; youth, —.073; agility, .060; and spatial .332. This would indicate that the test is strongly perceptual and spatial.

Remmers and Smith (1936) found reliabilities of only .70 with three trials given as an amount limit as proposed by O'Connor. They

O'CONNOR BLOCK TEST
MEAN OF FOUR TRIALS



suggest that at least ten trials are necessary for guidance work which was indicated at .90 for satisfactory results.

Bunch, Kjerland and Lauer (1950) reported a study on the reliability of the O'Connor Blocks. Their method of scoring was four time-limit trials of two minutes each to obtain a reliability of .80. It would require approximately six trials to bring the reliability up to .850.

This study is an attempt to test the hypotheses that: (a) there is a difference in performance between men and women; (b) there is a difference in performance among age groups; (c) the performance of men and women is not affected differentially by process of age grouping.

METHOD AND PROCEDURE

The method was essentially that of giving the O'Connor Block test to a sufficient number of subjects, of both sexes, under standard conditions to obtain statistically substantial results. One hundred subjects, 66 men and 34 women, ranging in age from 17 to 77, were given four time-limit trials of two minutes each. The number of seconds per block assembled was used as a basis of scoring the results. Standard instructions were given each subject for this test as described by Bunch, Kjerland, and Lauer (*ibid*) 1950. Formula (1) gives the method of scoring as basically used. The number of blocks assembled was corrected for extra piles started.

$$\text{Score} = \frac{\text{Time}}{\text{Blocks assembled—extra piles}}$$

The subjects were from six countries, besides the United States. A variety of vocations was represented in the sample. Among those included were college instructors, research workers, tradesmen, professional workers, driver training instructors and students.

THE APPARATUS

The apparatus used in the experiment consisted of a set of O'Connor Blocks, a stop watch and a small table. The subjects were seated during the assembly tests.

RESULTS

All subjects were grouped according to age and sex. The age groups selected were 12-21, 22-26, 27-31, 32-77.

The mean and standard deviations were obtained for all age groups and both sexes. A double classification for analysis of variance was used for determining group, sex and interaction.

Table I

Age Groups	Measures	Men	Women	Sexes Combined
12-21	Mean	70.94	63.68	68.82
	S. D	33.70	26.53	31.8
	N	17	7	24
22-26	Mean	52.76	79.70	61.44
	S. D	25.61	60.72	44.62
	N	19	9	28
27-31	Mean	50.94	102.28	71.95
	S. D	29.93	65.37	55.14
	N	13	9	22
32-77	Mean	107.10	159.20	125.13
	S. D	86.88	70.59	85.26
	N	17	9	26
Group Comparisons	Mean	71.07	103.41	82.08
	S. D	37.52	70.64	63.42
	N	66	34	100

Table I indicates that as age progresses, a poorer performance is shown by women and with greater variability. The performance of men is progressively better through age 31. The score of the older age groups is noticeably poorer and more variable than the younger groups. There is a wide difference in the mean scores of sexes favoring the men. Men are less variable than women.

Table II

Double Classification for Analysis of Variance Using Special Age Groups.

Source	d.f.	ss	ms	F
Sex	1	23619	23619	9.96*
Age Group	3	66752	22251	9.38*
Interaction	3	91490	30496	12.67*
Error	93	220533	2371.32	
Total	100	402394		

*Highly significant at 1% level.

The results presented in Table II indicate that there is a highly significant difference between age groups, sex groups and the interaction of these groups in their performance of the O'Connor Block Test under conditions of this test.

CONCLUSIONS

1. Women perform differently than men on the O'Connor Block Test. Men have superior scores on the average.

2. There is a significant difference among age groups in respect to performance. Superior scores were made by men at the age 27-31. Women do best at younger ages.
3. Significant interaction would indicate that as far as performance is concerned:
 - (a) Age groups for women are different than like age groups for men.
 - (b) When grouped by ages the performance of both men and women is affected differently than when classified by the same age groups.
4. Women's performance on the O'Connor Blocks decreases with age.
5. Men's performance on the O'Connor Blocks increases up to age 31 and decreases beyond this point.

References

1. Miller, Charles and Lauer, A. R.—The mechanical aptitude of drivers in relation to performance at the wheel. *Proc. Iowa Acad. of Science*, 1946, 55; 273-275.
2. Bunch, R. H., Kjerland, R. N., and Lauer, A. R.—Reliability of the O'Connor Block Test, *Proc. Iowa Acad. of Science*, 1950 (in press).
3. Keane, F. L. and O'Connor, J.—A measure of mechanical aptitude, *Pers. J.*, 1827-28, 6; 15-24.
4. Harrell, T. W.—A factor analysis of mechanical ability tests, *Psychometrika* 1940, 5; 17-33.
5. Remmers, H. H., and Smith, J. M.—Reliability and practice effect in the O'Connor Wiggly Block Test, *J. App. Psychol.*, 1936, 20; 591-598.

DEPARTMENT OF PSYCHOLOGY
IOWA STATE COLLEGE
AMES