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ABSTRACT

In 1967, an investigation into the utility of the Youth Fitness Test for mentally retarded children found that only four of the seven items were suitable. The other three (pull-ups, sit-ups, and the 600-yard run/walk), were modified to establish the Special Fitness Test for the mentally retarded. This test, however, was used only with educable mentally retarded children. The purpose of the present study was to determine if this same test could be used with trainable mentally retarded children. It was found that the following three items were unsuitable for the population in the study: (a) flexed-arm hang, (b) sit-up, and (c) shuttle run. Each item in the test was analyzed and the following suggestions were made: (a) the flexed-arm hang should be replaced by another item designed to measure arm and shoulder girdle strength, (b) the shuttle run should be replaced by another item designed to measure agility, (c) the softball throw should be dropped, and (d) the remaining four items should be retained but modified to make them more suitable for trainable mentally retarded children. (PB)

A CRITIQUE OF THE SPECIAL FITNESS TEST

by

Haddon G.B. Speakman

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This paper was presented at the 89th Annual Convention of the American Alliance of Health, Physical Education and Recreation held at the Convention Center, Anaheim, California on April 1, 1974.

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INTRODUCTION

In 1967, an investigation into the utility of the Youth Fitness Test with mentally retarded children found that only 4 items were suitable. (3) In addition, this study also determined that in order for the remaining 3 items to be successfully administered to this population, the following modifications had to be made: The pull-up for boys was changed to the flexed arm hang because many children could not perform a single pull-up; the sit-up was changed from the number that could be executed in an unlimited time to the number performed in one minute, this was because efforts lasting longer than one minute became a motivational problem; and because 600 yards proved to be a motivational problem, the run-walk was changed to 300 yards which was felt to be a sufficient test of cardio-respiratory endurance. In a later study reported in the same publication (3), the 3 modified items plus the original 4 were administered to 4200 mentally retarded children in public schools in the continental United States and norms were compiled for both sexes, ages 8 to 18. The above 7 items and the norms were then published as the Special Fitness Test Manual for the Mentally Retarded.(5)

Of the several classification systems for mentally retarded persons, probably the most commonly used has 3 categories: custodial mentally retarded (cmr)-IQ's 0 to 30;

trainable mentally retarded (tmr)-IQ's 30 to 50; and educable mentally retarded (emr)-IQ's 50 to 70. There is little evidence of the motor abilities of cmr people because their inability to follow instructions makes most of them untestable by means of standard instruments. However, several comparative studies between groups of tmr and cmr children have been conducted and they all indicate that in motor fitness, tmr children are significantly inferior to their emr peers.(2)

From the title of the Special Fitness Test Manual, it would appear that the 7 items of this test and their norms are appropriate for use with all retarded children regardless of level of retardation. However, a close examination of the manual reveals the following 4 references to level of retardation:

1. Page 1. Line 20

The test, a modification of the AAHPFR Youth Fitness Test, was developed by G. Lawrence Rarick, University of Wisconsin, and administered under his direction to over 4,200 youngsters throughout the country to establish national norms for educable mentally retarded boys and girls, aged 8 through 18.

2. Page 4. Line 29 (Listing the three advantages of the test).

Third, the test can be rather easily given to educable retardates.

3. Page 5. Line 1.

These norms were developed as part of a

national study which used a random sample of some 4,200 educable retarded boys and girls in the public schools of the continental United States.

4. Page 5. Line 4.

Using the tables of norms, teachers may compare the level of performance of each of their pupils with standards for other educable retarded boys and girls of the same chronological age.

As the test and norms were developed with emr children only, and the manual does not mention tmr children, it would seem that this instrument was meant only for the former population. However, nowhere in the manual is this stated. Furthermore, if this was the case, surely it would be indicated by the title. In this writer's view, because the authors did not develop this instrument or its norms with tmr children, they simply do not know how appropriate it is for this population, and have therefore chosen not to mention it in the manual.

Because tmr children are significantly inferior to their emr peers, both intellectually and motorically, a question must be asked concerning this test. "Is it suitable for use with tmr children?"

PURPOSE

The purpose of this study was to determine whether the Special Fitness Test is suitable for use with trainable mentally retarded children.

SUBJECTS

The subjects in this study consisted of 36 males and females residing at the Faribault State School in Faribault, Minnesota. On the first day of testing, their chronological ages ranged from 13 years 2 months to 18 years 11 months, with a mean of 16 years 5 months. There were 12 males and 3 females with IQ's between 10 and 39, and 16 boys and 5 girls with IQ's between 40 and 54. Ten of the subjects had Down's Syndrome, 12 had an etiology of brain injury, and the remaining 14 were undifferentiated. The subjects ranged in height from 52.5 to 69 inches with a mean of 61, and in weight from 75 to 157 pounds with a mean of 117. None of the subjects had any orthopedic or sensory handicaps.

MEASUREMENT

Special Fitness Test

This test has the following items: Flexed arm hang, Sit-up, Shuttle run, Standing Broad jump, 50-yard dash, Softball throw for distance, 300-yard run-walk.

The Peabody Picture Vocabulary Test

For a variety of reasons, the measurement of intelligence for severely handicapped children has proven difficult. To solve this problem, Dunn developed the Peabody Picture Vocabulary Test (PPVT) which is composed entirely of pictures. (1) The tester shows the subject a page with

four pictures on it and then provides a stimulus word, e.g. "Show me rat." The subject then indicates, by whatever means possible, which of the four pictures best represents the word "rat". A non-verbal subject can point, and a non-verbal subject who cannot point, can make a noise or movement to indicate when the tester points to the correct picture. There are 150 pages arranged in order of difficulty, and from the raw score obtained, the subject's IQ and MA can be found. Dunn claims that the tester requires no special preparation other than complete familiarity with the test materials, and in a previous study, the writer found this instrument to be reliable, objective and valid when used by physical educators. (4)

PROCEDURE

All residents at the Faribault State School in Faribault, Minnesota, between 13 and 19 years, who had been diagnosed as trainable mentally retarded by the school psychologist, and who did not have any orthopedic or sensory handicaps, were included in this study. The subjects were administered the PPVT by the writer, individually, in a quiet room and with no one else present. From the raw scores thus obtained, the equivalent IQ and MA scores were found in the PPVT manual. However, some of the raw scores were so low that the manual did not have

an IQ equivalent, whereas for every raw score there was an MA equivalent. The subjects were then administered each of the 7 items on the Special Fitness Test according to the descriptions in the manual, with two days rest in between each administration. Data obtained from items that were not correctly performed because they were either too physically difficult, too intellectually or too motivationally demanding, were not analysed. After the items had all been administered, the subjects were measured for height and weight. The data thus obtained were analysed to obtain the following information:

1. The test-retest reliability of each item: correlation between the best trial on the first administration and the same trial on the second administration.
2. The ability of each item to discriminate among different subjects: Standard deviation of the best trial on the first administration.
3. The correlation between the best trial on the first administration of each item: IQ, MA, height, weight and CA.
4. The intercorrelations between the best trial on the first administration of all the items.

RESULTS

The following 3 items were found unsuitable for the population used in the study, and their data was not

analysed: Flexed arm hang, because it was too physically difficult; Sit-up, because it was too intellectually and motivationally demanding; and the Shuttle run, because it was too intellectually demanding. Below, each item is criticized firstly on its description as it appears in the manual, and secondly on the difficulties experienced in administering it. Suggestions are then made to improve items regarded to be worth retaining, and finally, in Table 1, appear the results of the analysis of the 4 items found suitable for this population.

Flexed Arm Hang

(a) Description

1. The distance separating the hands is not stipulated. Is it 2 inches, 2 feet, shoulder width etc.?
2. The manual states "Record in seconds the length of time the subject holds the correct hanging position." What happens when a subject's score falls half way between two seconds e.g. 10.5?
3. The manual states "...the pupil raises his body off the floor to a position where the chin is above but not touching the bar." Further on it states, "The stop watch is started as soon as the pupil takes the un-assisted holding position." Thus, a subject using this method of adopting the starting position, as opposed to stepping off a stool as the manual also suggests, is expending arm and shoulder girdle strength and not receiving

credit for it in the test score.

4. The manual states that "The watch is stopped when the pupil's chin touches the bar,. . .pupil's chin falls below the level of the bar." The second restriction is not consistent with the first. It should be when the pupil's chin falls to the level of the bar.

(b) Administration

1. Many children could not perform this item; in addition to being unable to raise themselves from the floor to the holding position, they were unable to hold the correct position when they stepped off the stool, and dropped immediately to the floor.

2. The manual states "The watch is stopped when the pupil's chin touches the bar." On many occasions, when the chin touched the bar, the subject quickly raised and held the correct position for several more seconds. From the norms it can be seen that one second is worth more than one percentile point.

3. The manual states that "The watch is stopped when . . .pupil's head tilts backward to keep the chin above the bar." Tilting of the head proved to be a natural response when importance was placed on keeping the chin above the bar, and subjects would do it whether they needed to or not.

4. The manual states that "The height of the bar should be adjusted so it is approximately equal to the

pupil's standing height." Readjustment of the bar for small and tall subjects proved to be time consuming.

(c) Suggestion

Replace this item with another one that also measures arm and shoulder girdle strength.

Sit-up

(a) Description

1. In one place the manual states that the "hands are placed on the back of the head," in another place it states that "the fingers must remain in contact behind the neck throughout the exercise, and further on it states "No score should be counted if the fingertips do not maintain contact behind the head."

There are 2 criticisms of this confusing description.

(i) Are the hands to be placed behind the head, or neck, or will either do? All 3 diagrams show the subject's hands behind the head.

(ii) If the fingers are interlaced as the manual requires, the fingertips will never at any stage be in contact, and practically all of the fingers will not come in contact with either the head or neck.

2. The manual states that the subject sits up "touching the elbow to the knee." In the accompanying diagram, the subject is touching opposite elbow to opposite knee, as is required in the sit-up item in the

Youth Fitness Test from which this item was adapted. (6)
Is this what is required, or can either elbow touch either knee?

3. The manual states that "the back should be rounded and the head and elbows brought forward when sitting up as a 'curl up'." Yet in the second diagram that depicts the subject midway and through the sit-up, the elbows are held back, the back is not rounded, and the head has not been brought forward. In the third diagram that depicts the completion of the sit-up, only the elbow that touches the knee is brought forward, while the rest of the position is unchanged.

4. The manual states that the legs are extended with the feet a comfortable distance apart. This distance should be standardized.

(b) Administration

1. Occasionally subjects would complete the sit-up but forget to touch elbow to knee.

2. Sixty seconds was found to be a motivational problem, with subjects losing interest after about 30 seconds.

3. Most of the subjects would bend their knees slightly during the sit-up despite being told not to.

4. Most of the subjects would forget to hold their elbows wide when returning to the starting position.

5. Most of the subjects would forget to flatten their back on the mat before the starting position.

6. Frequently the subjects would pull their hands away from behind their neck and head during the course of this item.

(c) Suggestions

1. Reduce the time limit to 30 seconds.

2. The subjects must keep their fingers interlaced behind their head or neck.

3. Any elbow can touch any knee.

4. In the starting position, the subject sits with the knees bent so the heels are twelve inches from the buttocks, and the tester holds the subject's feet to the ground and in contact with each other.

5. The diagrams should be changed to correctly illustrate the description.

6. The elbows do not have to be held wide when returning to the starting position.

7. Only the area of the back between the vertebral borders of the scapula need touch the mat.

8. A sit-up is counted if: the elbow reaches the level of the knee without touching it; and if the hands do separate and/or lose contact with the neck or head, with a maximum of three allowed.

Shuttle Run

(a) Description

1. According to the Special Fitness Test Manual, this item has been taken, unaltered, from the Youth Fitness Test. However, on comparing the position of the blocks in the diagram in each of the 2 manuals, it can be seen that in the Youth Fitness Test, they rest in a horizontal position, whereas in the Special Fitness Test, they rest in a vertical position.

2. The distance that separates the 2 blocks is not indicated. Should it be one foot, two feet etc.?

3. The manual states that the blocks should be placed behind the lines, but does not indicate how far. This aspect of the item can be easily standardized by placing the blocks on the line.

(b) Administration

This item proved to be too intellectually demanding and the subjects demonstrated their confusion in a variety of ways.

1. Both blocks would be picked up at the same time.

2. Subjects would stop after bringing one block back.

3. The first block would be placed in front of the line and not behind it.

4. When returning with the second block, subjects

would slow down and often stop before reaching the finish line.

5. Frequently subjects would slow down or stop in the middle of the item.

(c) Suggestion

Replace this item with another one that also measures agility.

Standing Broad Jump

(a) Description

1. The manual states that the "pupil stands with . . . the toes just behind the take-off line." It is assumed that the measurement is taken from the anterior border of this line. If the take-off line is 1 inch wide and the subject's toes are 1 inch behind the posterior border of the line, the first 2 inches that the subject jumps will not be measured. From the norms it can be seen that 2 inches can mean as many as 10 percentile points.

2. The manual states ". . . measure from the take-off line to the back of the heel nearest the take-off line." What happens when the subject, upon landing, leans back and touches the jumping surface?

(b) Administration

Subjects would stand several inches behind the take-off line and when asked to move forward and place their toes level with the line, would have difficulty in

doing so.

(c) Suggestions

1. It is suggested that 6 strips of tape, 3 feet long and 1 inch wide, be placed on the floor parallel to the take-off line. Three would be in front of the take-off line and 3 behind, and they would be separated by a distance of 1 inch. After the subject had jumped, 1 of the 2 testers, using a 6 inch ruler, would measure the number of inches behind or in front of the anterior border of the take-off line that the subject jumped from. This figure would be added to or subtracted from the jump as measured from the anterior border of the take-off line. To facilitate measurement at the point of landing, strips of masking tape, 1 inch wide and 3 feet long, are laid out along the jumping area and parallel to the take-off line. The first strip is 5 inches from the take-off line, and the same distance separates succeeding strips. The distance of each strip from the anterior border of the take-off line is marked at its right-hand end. A second tester, using a 6 inch ruler, measures the distance past the last strip of masking tape that the subject jumps, and adds this figure to the number on the right-hand end of this strip.

2. The measurement is always taken from the back of the heel nearest the take-off line even if the subject

does touch the jumping surface behind this point.

50-Yard Dash

(a) Description

The manual states, "The pupil takes a starting position behind the starting line," and further on, "while a sprinter's crouch is good, any starting position may be used." The starting position should be standardized.

(b) Administration

1. Occasionally subjects would react badly to being beaten and slow down.

2. Subjects would slow down as they approached the finish line.

(c) Suggestions

1. Subjects that slow down because they are being beaten should be tested again by themselves.

2. Because some subjects slowed down before the finish line, it is suggested that an obvious but false finish line be placed 5 yards beyond the real but less obvious finishing line. Thus when subjects slow down, they will do so after the watch has been stopped.

3. 12" x 12" starting boxes are marked out on the running surface with masking tape. The subjects adopt the starting position in the box, leaning forward with the hands resting on the knees and legs together.

Softball Throw for Distance

(a) Description

1. The manual states "The distance recorded is the distance measured from the point of landing to the point of throwing." It is not stated what the point of throwing is. There are 2 possibilities: firstly, it could be the toe of the forward foot at the moment of release; and secondly, the diagram indicates that it could be the point on the restraining line opposite the toe of the forward foot at the moment of release.

2. The manual states that the ball is thrown while the subject is within the restraining area. Is the throw counted if the subject steps out of this area before releasing the ball?

3. The manual states that the subject may take a few steps before throwing. This variable should be controlled.

4. The manual states, "Record the best of 3 trials to the nearest foot." What is the measurement if the ball lands on the 6 inch mark?

(b) Administration

1. Subjects would often step over the restraining line before or while releasing the ball.

2. Some subjects would stand and throw, while others would take a few steps.

(c) Suggestion

Eliminate this item as has been recently done in the Youth Fitness Test.(7)

300-Yard Run-walk

The manual suggests 2 courses: in the first, the subjects run up and down a 50-yard course 3 times, and in the second, the subject runs 6 times around a rectangle 50' x 25'. Both methods were used in this study with the one modification in the first method. Because space was available, it was felt that it would make the item less complicated if the subject ran up and down a 75-yard course twice.

(a) Description

The manual states, "Record the elapsed time in minutes and seconds." If the watch is stopped exactly on a half-second, is the time taken to the upper or lower second e.g. 1:07.5?

(b) Administration and Suggestions

Method 1

1. Often subjects would stop after they had run up and down once. If the course was 150 yards long, this difficulty would be obviated.

2. Some subjects would begin to run back before they reached the end of the course, and if the subject who was leading did so, it increased the likelihood that the

others would. To prevent this occurring, it is suggested that a chair be placed at the 150 yard line and that the subject be instructed to touch it before returning.

3. The subjects had a tendency to slow down or stop running about 10 yards before the finish. Therefore it is suggested that the course be 160 yards long and that the time be taken when a disguised finishing line is crossed, 20 yards before the starting line.

4. Occasionally there were emotional outbursts and refusals to run that could be attributed to the negative effects of competition. In these cases, it is suggested that the subjects be tested alone.

Method 2

The subjects were unable to negotiate the corners very well and ran several yards past them before turning. As a result, they ran more than 300 yards and the distance covered varied from subject to subject. It is suggested that, by means of rope, an outside border be set up to form a 5 foot running lane between this border and the inside border.

CONCLUSIONS

1. In its present state, this test is unsuitable for use with trainable mentally retarded children.
2. The flexed arm hang should be replaced by another item designed to measure arm and shoulder girdle strength.

3. The shuttle run should be replaced by another item designed to measure agility.

4. The softball throw should be dropped.

5. The remaining 4 items should be retained but modified to make them more suitable for tmr children.

DISCUSSION

In 1967, the Youth Fitness Test was found to be unsuitable for emr children and changes were made in some of the items. As a result, we now have 2 tests, the Youth Fitness Test suitable for children with normal intelligence and the Special Fitness Test suitable for emr children. Now this study has found that the Special Fitness Test is unsuitable for tmr children. Is the next step to create a third test suitable for this population? It is this writer's opinion that our National Association should embark on another Youth Fitness Project similar to the one held in the fifties, and that its aim be to develop a single fitness test suitable for use with all 3 of the above groups and others such as the visually impaired and emotionally disturbed, and that norms be compiled for each group.

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TABLE I

Test-Retest Reliability, Standard Deviations, and Correlations Between Items,
and other Variables.

<u>Item Number</u>	<u>Items</u>	<u>Trials</u>	<u>r</u>	<u>SD</u>	<u>Items</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>IQ</u>	<u>MA</u>	<u>HT</u>	<u>WT</u>	<u>CA</u>
1	Standing Broad Jump	1	.81**	12 inch.	1	32	.57**	.61**	-.39*	.20	.27	.20	.40*	.03
	n			32	32	31	29	24	28	24	28	32	32	32
2	50-yard Dash	1	.91**	2.5 sec.	1	35	-.30	.50**	-.40*	-.45*	-.37*	-.27	-.02	
	n			35	32	34	32	27	31	35	35	35	35	
3	Softball Throw for Distance	3	.93**	19.1 ft.	3	31	-.30	-.22	-.28	-.11	.22	.40*	.36*	
	n			31	31	31	34	31	26	30	34	34	34	
4	300-yard Run-walk	3	.90	16.9sec.	3	30	.50**	-.22	-.34	-.49	-.58	-.30	-.33	
	n			30	29	32	31	25	28	28	32	32	32	

* Significant at the .05 level.

** Significant at the .01 level.

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