

A STUDY OF MOTOR ABILITY LEVELS OF PHYSICALLY
HANDICAPPED STUDENTS IN THE JUNIOR MIDDLE SCHOOL,
TAIWAN, REPUBLIC OF CHINA

(本文曾於 1985 年 10 月 27 日第十四屆全美特殊體育會議時發表)

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abstract

In June 1973, the Department of Education of Taiwan Provincial Government, ROC. instructed the Taiwan Provincial College of Physical Education to study how to carry out a physical education program for the physically handicapped students in junior middle school. The College's authority assigned the author to direct this research work. Many principals and teachers of the concerned schools as well as several experts and doctors were invited to take part in some conferences. The decision was made to carry out a motor ability test and construct the percentile tables for the convenience of the special physical education class' teachers to rate the score of physical education. 32 test items were selected. Finally, a total of 3580 students from 86 schools took part. The ages of them were 13-16. A percentile norm table was constructed on all the test items. These are the first motor ability norms ever developed in my country for physically handicapped individuals. Each item has six norm tables, divided by sexes and specific handicapped groups. A total of 113 tables are presented.

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I. Purposes of the Testing Program

With a view to stimulate all junior middle schools in Taiwan, ROC. to upgrade physical education program for those physically handicapped students, at the end of June, 1973, the Department of Education of Taiwan Provincial Government instructed the Taiwan College of Physical Education, Taichung, to design a physical education program specifically for the physically handicapped students in the junior middle schools. The author was appointed by the College to sponsor this job. After several meetings by principals, teachers and orthopedists who were invited by the College, A draft of physical education program for physically handicapped students of the junior middle schools had been completed. At the meantime, a decision was also made to hold a motor ability test for the physically handicapped students in the junior middle schools, in order to realize the physical fitness of them, and to provide schools with a test battery appropriate for assessing the motor ability of physically handicapped students. The purposes of the testing program presented by this article are as follows:

- (I) To serve as stimulation to teachers and schools of physically handicapped students and arouse them to pay special attention to the physical education program for the physically handicapped students.
- (II) To give physically handicapped an incentive to improve their fitness and to heighten the level of their motor ability.
- (III) To assess progress of the individual student and serve as diagnosis for specific strengths and weaknesses.

(VI) To provide schools a reliable scale appropriate for assessing the motor ability of physically handicapped students.

II. Procedure

(I) Selection of testing subjects: A Questionnaire was sent to all (503) junior middle schools in the Province in order to know the number of physically handicapped students in the school. Among 215 schools returning their questionnaire, 79 schools which have more than 10 physically handicapped students were selected to carry out the test.

(II) Dates of testing: First stage was on Sept. 15,-Dec. 31, 1973; second stage was on Feb. 1,-March 31, 1974.

(III) Place of testing: in the campus of the schools selected.

(IV) Tester: physical education teachers in all schools selected.

(V) Items of testing:

1. Among the 32 selected testing items, there are 28 items belonging to track and field, ball games and stunts, 6 items belonging to daily living activities. (see table I)

2. The testing procedures are simple, but high degree of reliability and validity can be secured.

3. The tests are designed without expensive facilities and equipments, so all schools can afford to hold the tests easily.

4. The tests consist of all components of physical fitness, such as strength, power, speed, endurance, agility, coordination and accuracy.

(VI) Classification of testees;

1. Since there are many types of retardation of physically handicapped students, it is necessary for teachers to discriminate them clearly, the method of classification of testees is based on anatomy.

They are classified into eight groups; each group is subdivided into three classes: slightly retarded, moderately retarded and seriously retarded. (see table II)

III. Analysis of results of tests and statistics

(I) Estimate of the number of physically handicapped students in the junior middle schools: According to the questionnaires sent back from 215 junior middls, We find out that 2400 studens out of 27,000 are physically handicapped. The ratio is 0.9%. There are approximately 900,000 students attending in junior middle schools. (according to the statistics of the Ministry of Education, ROC. 1974) By estimate, there are over 8000 physically handicapped students in the junior middle schools throughout the Taiwan area.

(II) Types of physically handicapped students

Through two stages of tests, we know that physically handicapped students can be classified into eight types. The number and the percentage of each type are shown as the following:

Types of retardation	first stage of test				second/stage of test				total
	boy	%	girls	%	boys	%	girls	%	
1. one lower limb retarded	916	71	616	73.2	639	73.4	458	79.1	73.4
2. two lower limb retarded	200	15.5	106	12.7	123	14.7	57	9.8	13.6
3. one upper limb retarded	73	5.6	44	5.2	57	6.1	31	5.6	5.8
4. one upper and one lower limbs retarded	41	3.2	29	3.4	28	3.2	21	3.4	3.3
5. trunk retarded	22	1.7	17	2.0	8	0.9	6	1.0	1.5
6. two lower and one upper limbs retarded	14	1.1	19	2.3	7	0.8	1	0.2	1.1
7. two upper and one lower limbs retarded	22	1.7	10	1.2	5	0.6	5	0.9	1.2
8. two upper and one lower limbs retarded	2	0.2	0	0.0	3	0.3	0	0.0	0.1
total	1290	100.0	841	100.0	870	100.0	579	100.0	100.0

Owing to the number of one lower limb retarded students is more than 70% among the total physically handicaps, there are lots of testees of such kind participating the test. Hence it is able to construct the percentile score table to divide into slightly retarded, moderately retarded, and seriously retarded for this group. But the rest of the groups could be constructed only one norm by mixing up all three classed in one group, because the number of testees is small. So when the school teachers use the percentile table, they may drop down or raise up the standard according to the students' degree of the retardation.

As the numbers of the students of one lower and one upper limbs retarded, two lower and one upper limbs retarded, two upper and one lower limbs retarded are much smaller, and the testing items they had possibly selected were limited. No percentile score tables were provided for them.

IV. Conclusion and finding

(I) 113 percentile score tables were constructed, the number of tables for each type of the retardation as following:

types of retardation	girl	boy	total
1. one lower limb retarded	16	18	34
2. two lower limb retarded	11	14	25
3. one upper limb retarded	14	17	31
4. two upper limbs retarded	10	13	23
total	51	62	113

Since the pages are limited, the percentile score tables are not presented in this article.

(II) These norms were developed as part of a provincial study which used a random sample of some one third of the physically handicapped students in the junior middle schools over 20 counties and cities, so the construction of norms are based upon a wide distribution of the population, and the testing sample may be representative of the population for which the test is intended.

(III) From the strength test, you may find out in the scoring table, that those seriously retarded students whose normal limbs are usually stronger than the slightly retarded ones, such as the two lower limbs retarded students who always use their two upper limbs to work in daily life, so it is possible that the strength of their arms are better than their lower slightly retarded limbs. This is a fact of course.

(IV) The major objective of the evaluation is to encourage the students to engage in sports and recreational activities in order to improve their retarded conditions. Therefore, when the teachers carry out the tests, they should classify every physical handicaps into proper groups according to their retarded types and degrees of retardation. Emphasis also should be made on self-comparison. The scoring table is to be provided teachers with a test battery appropriate for assessing the physical fitness of handicaps. If those seriously retarded students unable to participate the testing program, they may take part in those testing items of tumbling, up-and-down of wheelchair, put-on-and-off

clothes etc.	1. one lower limb retarded	1.00
	2. two lower limb retarded	0.75
	3. one upper limb retarded	0.75
	4. two upper limbs retarded	0.50
	total	0.25
Since the persons are limited, the percentage score tables are not presented in this article.		
(II) These norms were developed as part of a pilot study which used a random sample of some one third of the physically handicapped students in the junior and		
high schools over 30 counties and cities in the		
state of Iowa. The norms are based upon a wide distribution of the population, and the testing sample may be representative of the population for which the test is intended.		

Table I : Items of testing

item should be tested	kind of handicapped		I	II	III	IV
	sex					
	M	F	M	F	M	F
1. softball throwing for distance	x	x	x	x	x	
2. softball throwing for accuracy	x	x	x		x	
3. soft baseball throwing for accuracy	x	x	x		x	
4. basketball push-pass for distance	x	x	x	x	x	
5. 30 sec. under basket shoting	x	x				
6. volley ball serve for accuracy	x	x	x	x		
7. soccer kicking for distance					x	x
8. soccer speed dribbling					x	x
9. soccer penalty kick					x	x
10. shot putting (8 lb.)	x		x			
11. shot putting (6 lb.)		x	x			
12. standing long jump					x	x
13. broad jump					x	x
14. 60 m. dash		x			x	
15. 100 m. dash	x				x	x
16. 200 m. dash					x	x
17. 400 m. running					x	x
18. chinning	x		x			
19. flexed arm hang	x		x			
20. bar dips	x		x			
21. push-ups	x		x			
22. knee push-ups	x		x			
23. sit-ups	x	x	x	x	x	x
24. squat thrust					x	x
25. 20 m. walking	x	x	x	x		
26. stair up-and-down	x	x	x	x		
27. arms flex					x	x
28. arms flex					x	x
29. legs lift	x	x				
30. legs flex	x	x				
31. upper back lift	x	x	x	x	x	x
32. trunk pivot	x	x	x	x	x	x

Table II: Classification of retarded degree

Class	Upper limb retarded	lower limb retarded	trunk retarded
I	<ol style="list-style-type: none"> 1.The limbs have completely retarded. 2.two limbs are broken above wrist joints. 	<ol style="list-style-type: none"> 1.Two lower limbs lose its functions. 2.Two lower limbs are broken above its thigh. 	The functions of trunk are retarded, so the subject is unable to sit up.
II	<ol style="list-style-type: none"> 1.Two limbs have apparently retarded. 2.All ten fingers are broken. 3.One limb is broken above one half of its lower arm. 4.One limb loses its functions. 	<ol style="list-style-type: none"> 1.Two limbs have apparently retarded. 2.Two limbs are broken above one half of its lower leg. 	The function of trunk is retarded, so it is difficult to sit up or (and) stand up.
III	<ol style="list-style-type: none"> 1.The first and second fingers of two limbs are broken. 2.The first and second fingers of two limbs lose its functions. 3.One limb has apparently retarded. 4.Five fingers of one limb are broken. 5.Five fingers of one limb lose its functions. 	<ol style="list-style-type: none"> 1.Two limbs are broken above metatarsal joint. 2.One limb is broken above one half of its thigh. 3.One limb loses its functions. 	Trunk loses its functions so it is difficult to walk.
IV	<ol style="list-style-type: none"> 1.Thumbs of two limbs are broken. 2.Thumbs of two limbs lost its functions. 3.One shoulder joint or one elbow joint or one wrist joint loses its functions. 4.First and second finger of one limb are broken. 5.First and second finger of one limb lose its functions. 6.Thumb and second with another one finger of one limb are broken. 	<ol style="list-style-type: none"> 1.All ten toes are broken. 2.All ten toes lose its functions. 3.One limb is broken above one half of its lower leg. 4.One limb has apparently retarded. 5.Hip joint or knee joint of one limb lose its functions. 6.The retarded limbs is shorter than normal limb 1/10 or over 1/10. 	<p>Remarks:</p> <ol style="list-style-type: none"> 1.If two kind of retardations in the same class are appeared, it should be promoted one class. 2.The first and second class belong to seriously retardation; the third and fourth class belong to moderately retardation; the fifth, sixth and seventh class belong to slightly retardation.
V	<ol style="list-style-type: none"> 1.The functions of two thumb have apparently retarded. 2.Among shoulder joint,elbow joint or wrist joint, the functions of any one joint has apparently retarded. 3.A thumb is broken. 4.A thumb loses its functions. 5.The function of first and second finger of one limb have apparently retarded. 6.The functions of three fingers with a thumb or second finger of one limb have apparently retarded. 	<ol style="list-style-type: none"> 1.The functions of hip joint of one limb have apparently retarded. 2.Any one joint of one limb loses its functions. 3.Retarded limb is shorter than normal limb over 1/15 or 5cm. 	
VI	<ol style="list-style-type: none"> 1.The functions of a thumb has apparently retarded. 2.Two finger with one second finger of one limb are broken. 3.Two fingers with one second finger of one limb lose its functions. 	<ol style="list-style-type: none"> 1.A limb is broken above its metatarsal joint. 2.The functions of any joint of one limb has apparently retarded. 	
VII	<ol style="list-style-type: none"> 1.The functions of one limb has slightly retarded. 2.Among shoulder joint, elbow joint or wrist joint, the functions of above anyone joint has slightly retarded. 3.The function of one thumb has slightly retarded. 4.The functions of second finger with another one finger have apparently retarded. 5.The third, fourth, and fifth finger of one limb are broken. 6.The third, fourth and fifth fingers of one limb lose its functions. 	<ol style="list-style-type: none"> 1.The functions of all toes have apparently retarded. 2.One limb has slightly retarded. 3.Among hip joint, knee joint or ankle joint, the functions of anyone joint has slightly retarded. 4.All toes of one limb are broken. 5.All toes of one limb lose its functions. 6.The retarded limb is shorter that the normal limb over 1/20 or 3 cm. 	