

Ubon Child Motor Development Study

The Scientific Survey on Health and Lifestyle
of School Children in Northeastern Thailand

edited by

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FOREWORDS

Ubon child health and development study had started in 1983. Our research publication in English first appeared in its present form in 1990, and a new collection of statistical data has been compiled and published every year since then. This data collection brings together items for 19 physical fitness and motor ability indicators. The edition is the joint undertaking of the scientific survey project for health statistics in Southeast Asia set up within Otsuma Women's University, University of Tsukuba in Japan and Srinakharinwirot University in Bangkok, Thailand. In addition, the educational office of 10th region in Ubon Ratchatani in Thailand, joined the project.

This report presents the results of the 5th, 7th and 9th scientific survey conducted in 1988, 1990 and 1992, by the scientific survey project for health statistics in Southeast Asia.

The objectives of the survey were to obtain statistical information on developmental characteristics of motor ability for children and feasibility of simplified motor ability test in Northeastern Thailand.

It is our hope not only to publish factual data disclosing the existing issues, but also to evaluate the health status that are feasible if each school wish to know.

We wish that this data book will be of reference, and we welcome comments from users.

February 1, 1993

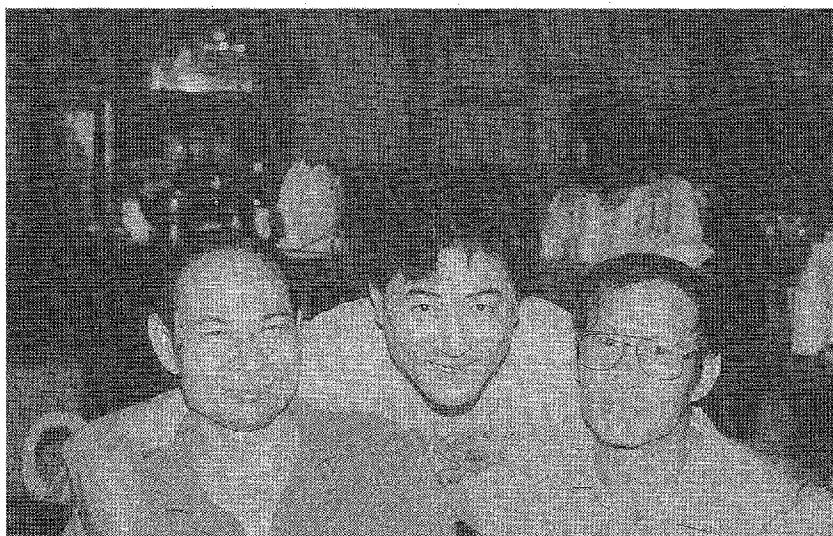


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CHAPTER 2: MEASUREMENT METHOD AND STATISTICAL RESULT OF MOTOR DEVELOPMENT

1. Grip Strength
2. Standing Long Jump
3. Sit-ups
4. Modified Push-ups
5. Timed Shuttle Run
6. 5-Minute Distance Run
7. Softball Throw for Distance
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9. Two Handed Shot Put
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12. Soccerball Lifting
13. Soccerball Zigzag Dribbling
14. Ball Batting
15. Rope Skipping
16. Flying Disk Throwing
17. Vertical Jump with Run-up
18. Leapfrog

1. Grip Strength

Purpose:

This test measures the grip strength of the right or left hand.

Equipment and Facilities:

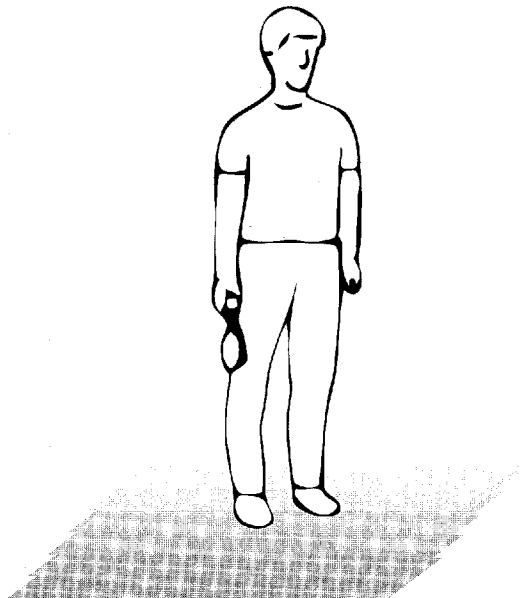
The only equipment needed is a hand grip dynamometer.

Procedure:

The student places the grip dynamometer in the palm of the right or left hand (with the dial toward the palm) so that the convex edge is between the first and second joints of the fingers and the rounded edge is against the base of the hand. The student bends the elbow slightly, and is placed their arm down. Then, He or she grips with maximum force. At the same time the student is careful not to touch the body or any object.

Scoring:

Each student has two trials. The best of the grips is recorded.



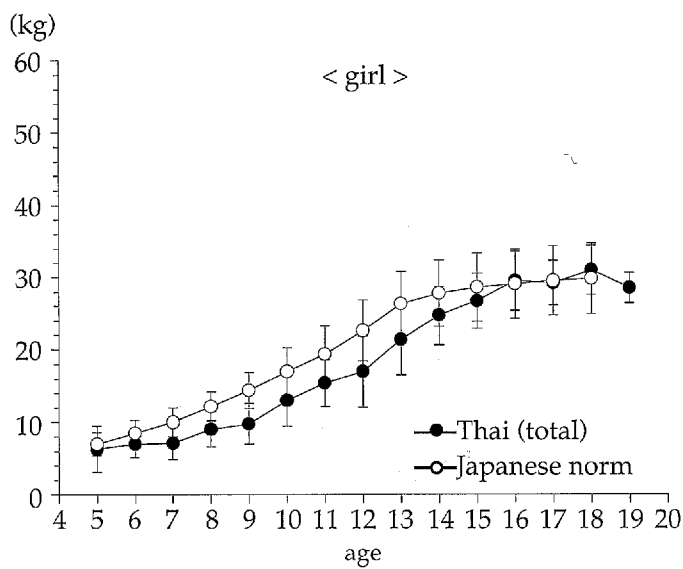
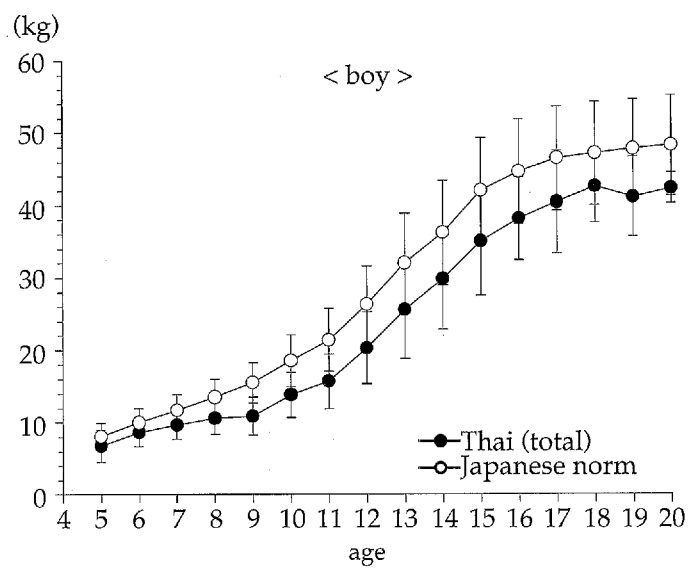


Fig 1 Grip strength

Table 1 - 1

GRIP STRENGTH (kg)

BOY

AGE											รร.วิภาควิทยาการ(๒๕๒๓)						AGE	
					รร.อุบลวิทยาคม(๒๕๒๓)				Wiphak Witthayakon(1984)									
					Ubon Witthayakhom(1984)													
									n MEAN S.D.									
4									4 6.8 2.2				4					
5					n MEAN S.D.				4 6.8 2.2				5					
6	รร.อุบลวิทยาคม(๒๕๒๖)				5 7.0 2.3				13 9.3 1.5				6					
7	Ubon Witthayakhom(1983)				17 9.3 2.0				14 10.3 2.0				7					
8	n MEAN S.D.				รร.เบญจามหาราช(๒๕๒๖)				18 10.4 2.2				8					
9	3 11.3 4.0				Benjama Maharat(1983)				20 10.6 2.6				รร.เบญจามหาราช(๒๕๒๓)				9	
10	32 13.2 2.5				n MEAN S.D.				19 15.1 3.2				Benjama Maharat(1984)				10	
11	38 14.9 4.1				3 22.0 2.6				20 16.1 3.2				n MEAN S.D.				11	
12	42 20.3 4.6				18 22.3 6.7				12 16.9 2.4				12 22.3 5.4				12	
13	2 22.7 12.8				37 26.2 7.0								11 24.8 5.3				13	
14					42 27.6 6.1								18 35.0 6.7				14	
15					38 35.0 7.0								22 35.7 7.1				15	
16					8 38.0 7.6								19 37.8 5.7				16	
17													10 40.8 7.8				17	
18													16 44.7 4.1				18	
19													2 47.0 9.9				19	
20																	3 42.3 2.1	20

Table 1 - 2

GRIP STRENGTH (kg)

BOY

AGE	Total			Japanese Norm		AGE
	n	MEAN	S.D.	MEAN	S.D.	
4						4
5	4	6.8	2.2	8.1	1.8	5
6	18	8.7	2.0	10.0	2.0	6
7	31	9.7	2.0	11.7	2.2	7
8	43	10.6	2.2	13.5	2.5	8
9	42	10.9	2.6	15.5	2.8	9
10	68	13.8	3.1	18.5	3.6	10
11	79	15.7	3.8	21.4	4.3	11
12	98	20.3	5.0	26.3	5.3	12
13	74	25.6	6.8	32.0	6.9	13
14	80	29.8	6.9	36.2	7.2	14
15	79	35.0	7.5	42.0	7.2	15
16	44	38.1	5.7	44.6	7.2	16
17	24	40.4	7.1	46.4	7.2	17
18	28	42.6	5.0	47.1	7.1	18
19	15	41.1	5.5	47.7	6.9	19
20	3	42.3	2.1	48.2	6.9	20

Table 1 - 3

GRIP STRENGTH (kg)

GIRL

AGE	รร.อุบลวิทยาคม(๒๕๒๓)				รร.วิภาคย์วิทยากร(๒๕๒๓)			Total			Japanese Norm		AGE
	Ubon Witthayakhom(1984)				Wiphak Witthayakon(1984)								
	n	MEAN	S.D.		n	MEAN	S.D.	n	MEAN	S.D.	MEAN	S.D.	
4					3	6.3	3.2	3	6.3	3.2	7.0	1.6	4
5	2	8.0	0.0		10	6.8	2.0	12	7.0	1.9	8.5	1.8	5
6	20	6.9	2.3		17	7.3	2.2	37	7.1	2.2	10.0	2.0	6
7	19	8.3	2.6		23	9.7	2.0	42	9.0	2.4	12.2	2.0	7
8	22	9.2	2.2		22	10.3	3.2	44	9.8	2.8	14.4	2.5	8
9	21	14.0	4.0		18	11.9	2.5	39	13.0	3.5	17.0	3.3	9
10	18	15.0	3.2	รร.เบญจมาหาราช(๒๕๒๓)	19	15.8	3.3	รร.พิบูลมังสาหาร(๒๕๒๓)			19.4	3.9	10
11	10	16.0	3.9		7	14.6	1.9	Phibun Mangsahan(1984)			22.6	4.2	11
12	2	14.5	3.5	Benjama Maharat(1984)	1	12.0	0.0				26.3	4.5	12
13											27.8	4.6	13
14											28.6	4.7	14
15											29.1	4.8	15
16											29.5	4.8	16
17											29.8	4.9	17
18													18
19													19
20													20

2. Standing Long Jump

Purpose:

To measure power.

Equipment and Facilities :

Tape measure and a mat. Space on the floor or an outdoor jumping pit.

Procedures:

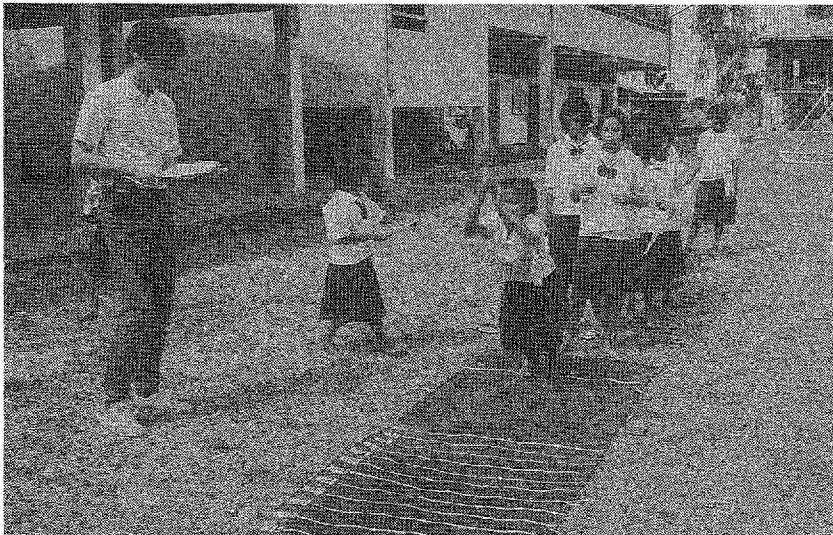
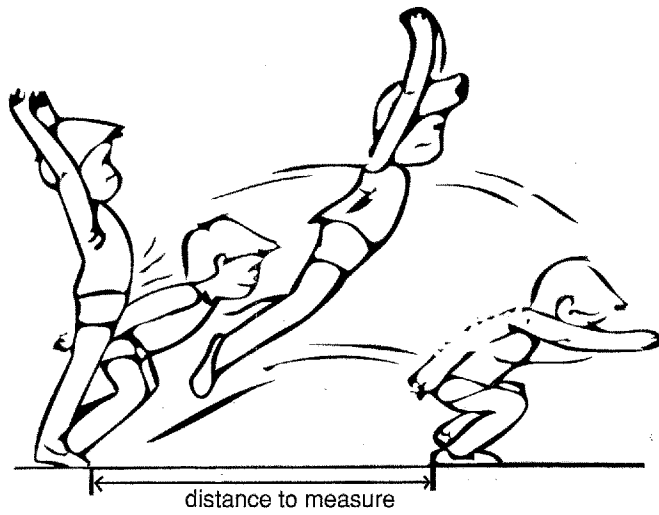
The child stands behind a takeoff line with his/her feet several inches apart. Before jumping, the child dips at the knees and swings the arms backward. He/she then jumps forward by simultaneously extending the knees and swinging the arms forward. Two trials are permitted. Measurement is from the closest heel mark to the takeoff line. Indoor administration is best accomplished by placing a tape measure on the floor at right angles to the takeoff line and permitting the child to jump along the line. Measurement can then be made by sighting across the tape to the point of the jump.

Instructions:

You must take off from both feet simultaneously, jump as far forward as possible, and land on both feet. Try not to fall backward after the landing. You can jump farther by crouching before the jump and swinging your arms.

Scoring:

The score is the distance between the takeoff line and the nearest point where any part of the child's body touches the floor. It is measured in meter and centimeter to the nearest inch. Only the best trial is recorded.



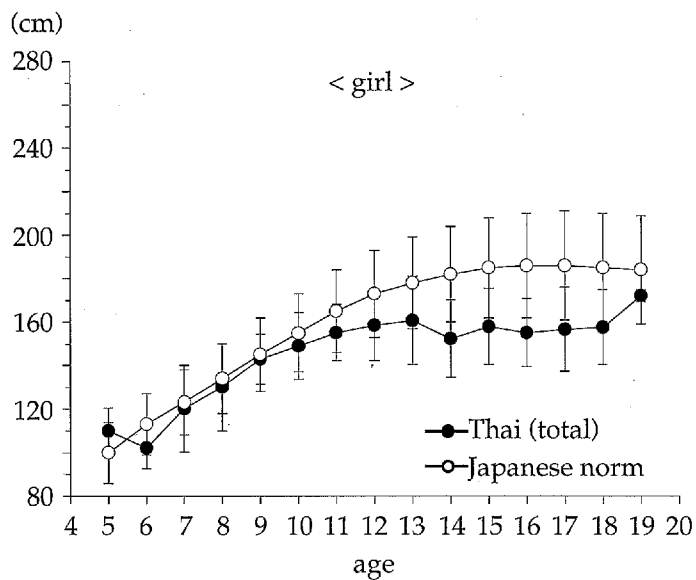
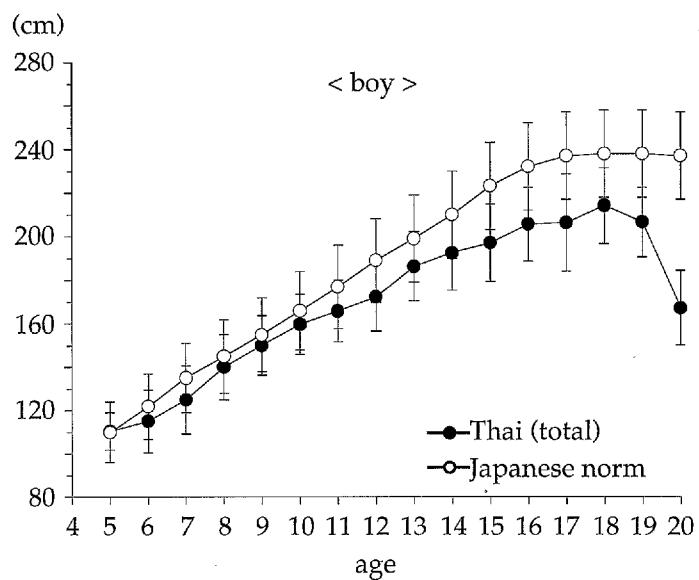


Fig 2 Standing long jump

BOY

[illegible]

Table 2 - 2

STANDING LONG JUMP (cm)

BOY

AGE								AGE			
4	นพรัตน์(๒๕๓๕)	n	MEAN S.D.	Total	n	MEAN	S.D.	Japanese Norm	MEAN	S.D.	4
5	Nakhon Phanom(1992)	4	110.5 8.7		4	110.5	8.7	110.0	14.0		5
6		18	115.1 14.4		18	115.1	14.4	122.0	15.0		6
7		43	122.3 14.2		43	125.0	15.8	135.0	16.0		7
8		64	142.1 15.0		64	140.1	15.0	145.0	17.0		8
9		62	152.7 14.9		62	150.1	13.7	155.0	17.0		9
10		68	171.7 10.3		68	159.8	13.9	166.0	18.0		10
11	ยโสธร(๒๕๓๕)	72	170.2 13.5		72	165.8	14.1	177.0	19.0		11
12	Yasothon(1992)	74	172.7 14.4		74	172.4	15.7	189.0	19.0		12
13		65			65	186.3	15.8	199.0	20.0		13
14		58	12 193.1 13.3		58	192.5	17.1	210.0	20.0		14
15		74	11 196.9 14.1		74	197.1	17.6	223.0	20.0		15
16		45	7 205.0 6.4		45	205.7	16.9	232.0	20.0		16
17		36	5 195.6 6.4		36	206.3	22.3	237.0	20.0		17
18		37	9 207.2 19.1		37	214.1	17.3	238.0	20.0		18
19		15	9 218.1 9.2		15	206.5	16.1	238.0	20.0		19
20		3			3	167.3	17.0	237.0	20.0		20

Table 2 - 3

STANDING LONG JUMP (cm)

GIRL

AGE	ร.วิภาควิทยาการ(๒๕๒๓) Wiphak Witthayakon(1984)										AGE						
	ร.อุบลวิทยาคม(๒๕๒๓) Ubon Witthayakhom(1984)				<u>n</u> MEAN S.D.												
4					3	110.0	10.4					4					
5	<u>n</u> MEAN S.D.				3	110.0	10.4	ร.บ้านหนองเงิน้อย(๒๕๓๕) Ban Nong Geonhoi(1992)				5					
6	2	90.0	11.3		10	104.6	7.7					6					
7	20	109.0	19.2		17	119.6	15.6	<u>n</u> MEAN S.D.				7					
8	19	115.1	19.4		23	132.8	14.5	2 141.5 20.5				8					
9	22	140.1	13.1		22	144.6	10.7	ร.พิบูลมังสาหาร(๒๕๒๓) Phibun Mangsahan(1984)				9					
10	21	142.6	15.8		18	143.8	11.7	14	157.4	16.0	ร.บ้านนากระแสง(๒๕๓๕) Ban Nakrasaeng(1992)		10				
11	18	142.3	12.3	ร.เบญจมาหาราช(๒๕๒๓) Benjama Maharat(1984)	19	159.7	7.2	<u>n</u> MEAN S.D.		30	157.3	12.0	11				
12	10	143.4	16.4		7	163.7	4.5	6	158.0	7.7	13	158.9	20.8	12			
13	2	141.0	24.0		<u>n</u> MEAN S.D.		1	156.0	0.0	24	171.0	14.2	12	172.5	15.8	13	
14	1 148.0 0.0								14	162.2	15.3	26 141.0 14.4				14	
15	10 159.0 6.4								21	153.5	19.8	15 164.1 19.8				15	
16	12 153.3 7.9								22	157.2	12.1	2 191.5 19.1				16	
17	17 148.5 16.6								23	156.6	21.5					17	
18	11 142.9 16.2								12	164.8	10.4					18	
19																	19
20																	20

Table 2 - 4

STANDING LONG JUMP (cm)

GIRL

AGE										AGE				
4	นครพนม(๒๕๓๕)					Total			Japanese Norm			4		
	n	MEAN	S.D.	n		MEAN	S.D.	MEAN	S.D.					
5	Nakhon Phanom(1992)					3	110.0	10.4		100.0	14.0	5		
6	<u>n MEAN S.D.</u>					12	102.2	9.6		113.0	14.0	6		
7	16	134.7	15.6			53	120.2	19.8		123.0	15.0	7		
8	14	144.3	16.7			58	130.1	20.1		134.0	16.0	8		
9	15	144.7	8.3			65	142.9	11.5		145.0	17.0	9		
10	15	156.2	12.5	ยโสธร(๒๕๓๕)		68	149.0	15.4		155.0	18.0	10		
11	16	160.3	11.6	Yasothon(1992)		83	155.2	12.9		165.0	19.0	11		
12	15	166.0	12.4	<u>n MEAN S.D.</u>		51	158.5	16.4		173.0	20.0	12		
13				10 164.4 17.6		67	160.7	20.4		178.0	21.0	13		
14				14 164.2 13.5		55	152.4	17.9		182.0	22.0	14		
15				6 155.8 14.3		52	157.9	17.5		185.0	23.0	15		
16				10 145.8 19.4		46	155.2	15.8		186.0	24.0	16		
17				11 169.0 12.1		51	156.6	19.4		186.0	25.0	17		
18				6 170.3 9.8		29	157.7	17.2		185.0	25.0	18		
19						2	172.0	2.8		184.0	25.0	19		
20												20		

3. Sit-ups

Purpose:

To measure muscular strength and endurance of the abdominal muscles.

Equipment and Facilities:

Stopwatch. Mats may be used if they are available; otherwise the floor is satisfactory.

Procedure:

The examinee lies on his/her back with knees bent at right angles. Hands should be clasped behind the head. A partner holds the ankles for support.

On "Go," the examinee performs repeated sit-ups, doing as many as possible in 30 seconds. The elbows should touch the knees in the "up" position. After each up movement, the examinee is to return to the back lying position with shoulders touching the mat.

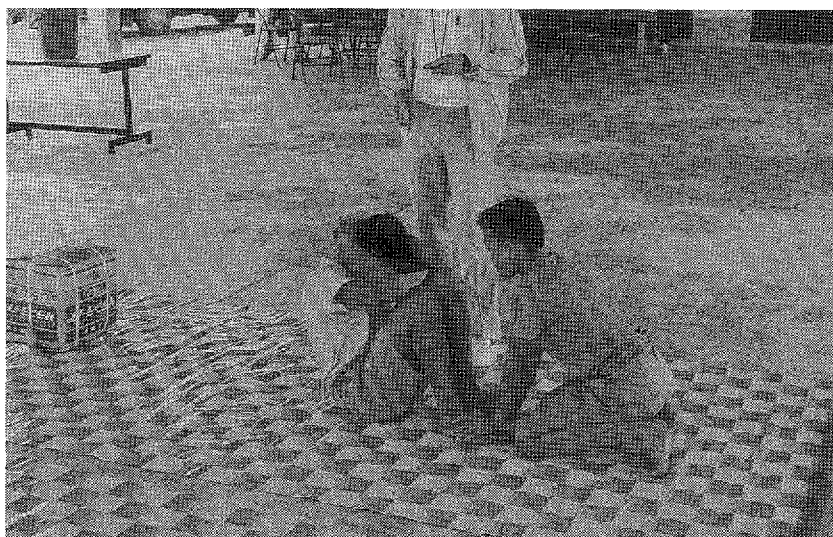
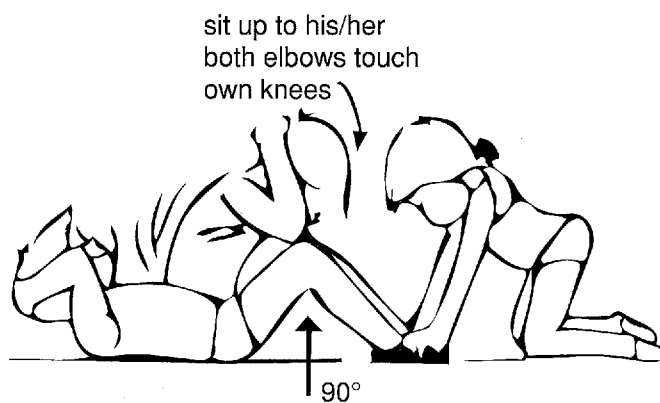
The examinee should be encouraged to breathe regularly during the test.

Instructions:

Your fingers must remain interlocked and in contact with the back of your neck at all times. You curl up from the starting position, but you may not push off the floor with an elbow. When you return to the starting position, your elbows must be flat on the floor or mat.

Scoring:

One point is scored for each correct sit-up. The score is the maximum number of sit-ups completed in 30 seconds.



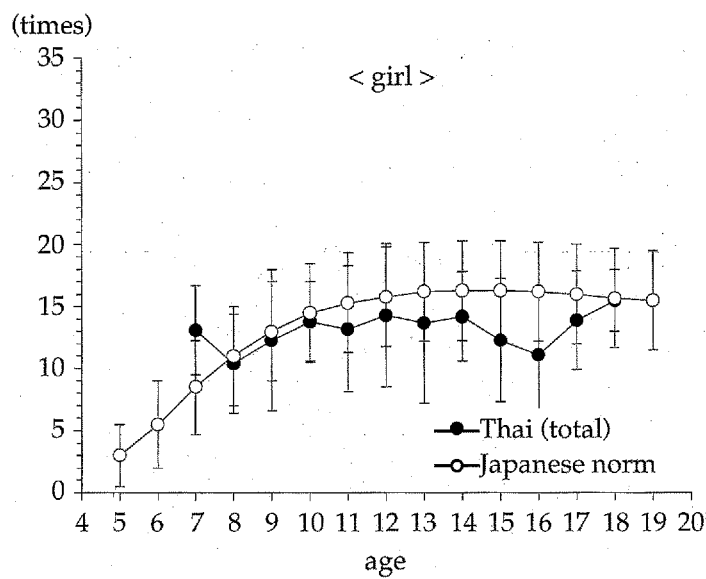
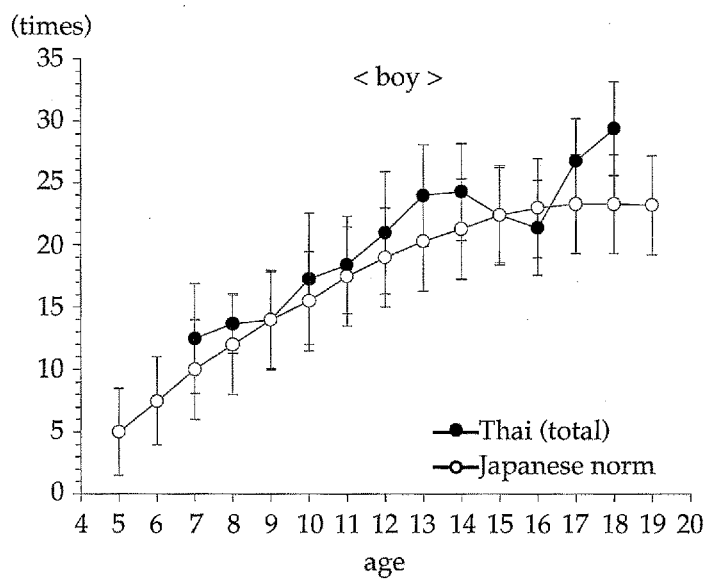


Fig 3 Sit-ups

Table 3 - 1

SIT-UPS (times per 30-second)

BOY

AGE										AGE									
										Japanese Norm									
										<u>MEAN S.D.</u>									
4										4									
5 รรบ้านหนองเงินฮ้อย(๒๕๓๕)										5									
6 Ban Nong Geonhoi(1992)										6									
7										7									
8										8									
9										9									
10										10									
11										11									
12										12									
13										13									
14										14									
15										15									
16										16									
17										17									
18										18									
19										19									
20										20									

Table 3 - 2

SIT-UPS (times per 30-second)

GIRL

AGE											AGE
4											4
5											5
6											6
7											7
8											8
9											9
10											10
11											11
12											12
13											13
14											14
15											15
16											16
17											17
18											18
19											19
20											20

				นภพพนม(๒๕๓๕)			Total			Japanese Norm		
				Nakhon Phanom(1992)						MEAN	S.D.	
				n	MEAN	S.D.	n	MEAN	S.D.			
5	รร.บ้านหนองเงินชัย(๒๕๓๕)			16	17.2	16.6	15	13.1	3.6	3.0	2.5	5
6	Ban Nong Geonhoi(1992)			14	10.1	4.3	16	10.4	4.0	5.5	3.5	6
7				15	14.6	4.3	21	12.3	5.7	8.5	3.8	7
8				15	14.5	2.6	28	13.8	3.2	11.0	4.0	8
9	รร.บ้านนากระแซง(๒๕๓๕)			16	17.0	5.1	46	13.2	5.1	13.0	4.0	9
10	Ban Nakrasaeng(1992)			15	15.7	6.8	28	14.3	5.8	14.5	4.0	10
11				10	17.3	6.0	40	13.7	6.5	15.3	4.0	11
12				14	14.5	4.9	40	14.2	3.6	15.8	4.0	12
13				5	12.8	6.0	20	12.3	5.0	16.2	4.0	13
14				10	10.4	4.2	12	11.1	5.5	16.3	4.0	14
15				11	13.9	4.0	11	13.9	4.0	16.3	4.0	15
16				6	15.5	2.5	6	15.5	2.5	16.2	4.0	16
17										16.0	4.0	17
18										15.7	4.0	18
19										15.5	4.0	19
20												20

4. Modified Push-ups

Purpose:

This test measures strength and endurance of the elbow extensor and shoulder flexor muscles.

Equipment and Facilities:

Stopwatch. Mats may be used if they are available; otherwise the floor is satisfactory.

Procedure:

<Male>

The partner postures himself on his hands and knees at the same level of the examinee's arms. The examinee posture himself in a push-up position, placing both legs on the partner's back ,while setting both hands on the floor at right angles. Both hands are to be placed on the floor at a shoulder width distance. The examinee flexs the feet and rests the instep of each foot on the side of the partner's chest (see figure).

<Female>

The partner lies in a prone position. The examinee postures herself in a push-up position, placing both legs on the partner's back, while setting both hands on the floor at right angles. Both hands are to be placed on the floor at a shoulder width distance. The knees are placed on the partner's spine in order keep the toes from supporting the lower portion of the body (see figure).

<Male and Female>

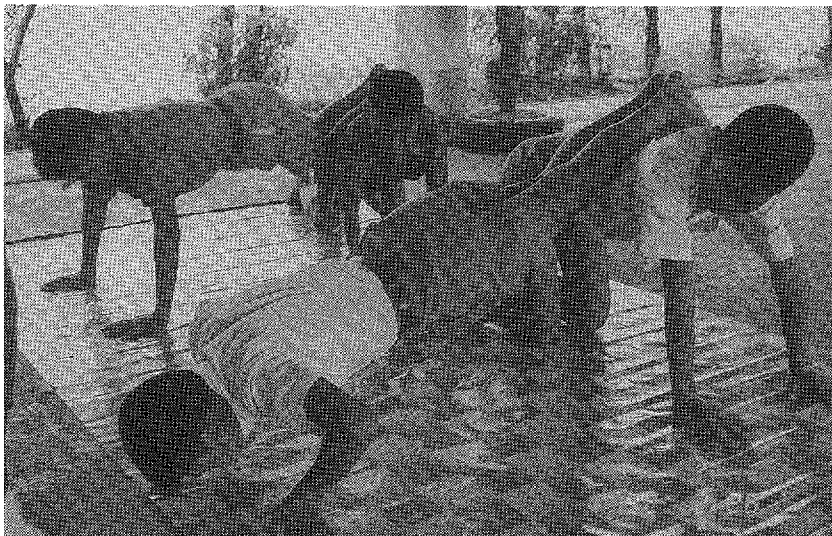
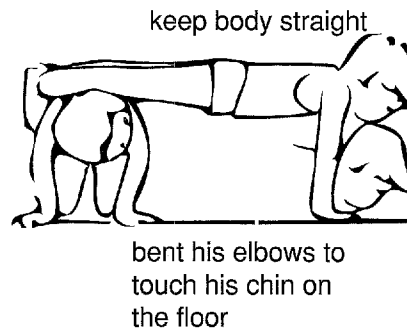
The examinee is to perform his/her maximum number of push-ups. Each push-up requires the examinee's chin to touch the floor before starting the next push-up. If the examinee is late in starting the exercise two times in succession in 1 time per 2 seconds, he/she will not be allowed to take the test.

Scoring:

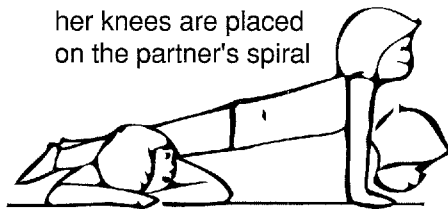
The test score is based on the maximum number of push-ups completed. The partner counts the total number of push-ups and the person administering the test records the results.

Instructions:

One must remain straight, keeping the body from moving, on twisting in any manner. The examinee and his/her partner should have similar physical characteristics in order to achieve the best results possible.



her knees are placed
on the partner's spiral



bent her elbows to
touch her chin on
the floor



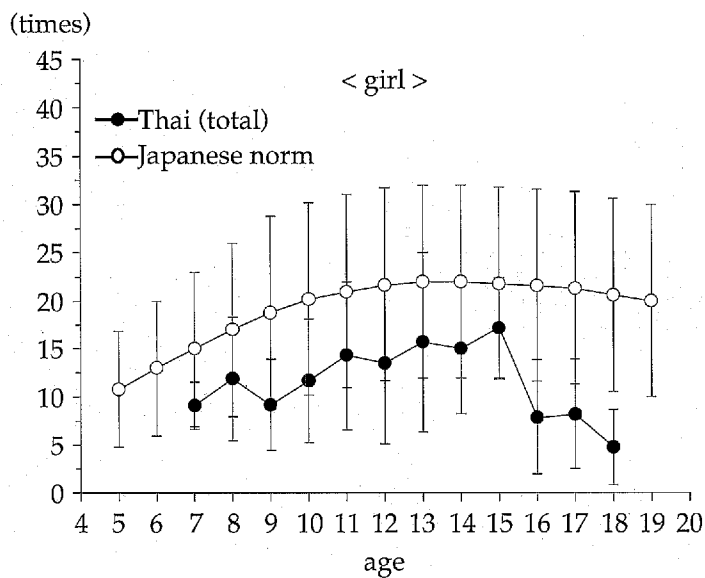
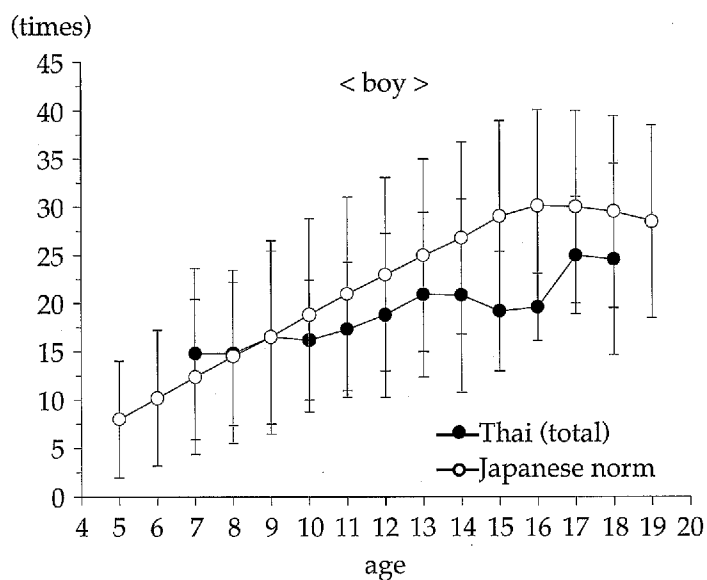


Fig 4 Modified push-ups

Table 4 - 1

MODIFIED PUSH-UPS (times)

BOY

AGE										Japanese Norm				AGE		
										MEAN		S.D.				
4	นครพนม(๒๕๓๕)													4		
5	หมู่บ้านหนองเงินฮ้อย(๒๕๓๕)				Nakhon Phanom(1992)				Total		8.0	6.0	5			
6	Ban Nong Geonhoi(1992)				n			MEAN			S.D.		6			
7	n			MEAN	S.D.	13	14.8	8.9	13	14.8	8.9	12.4	8.0	7		
8	5	15.4	5.5		16	14.6	8.1		21	14.8	7.4	14.5	9.0	8		
9	8	15.5	7.0		15	17.1	10.1		23	16.5	9.0	16.5	10.0	9		
10	17	15.3	3.9	หมู่บ้านนากระแซง(๒๕๓๕)	15	17.3	8.1	ยโสธร(๒๕๓๕)	32	16.2	6.2	18.8	10.0	10		
11	19	18.6	6.5	Ban Nakrasaeng(1992)	15	15.5	7.3	Yasothon(1992)	34	17.3	7.0	21.0	10.0	11		
12	14	17.6	6.8	n	MEAN	S.D.	15	16.2	6.7	n	MEAN	S.D.	23.0	10.0	12	
13	10	16.6	4.7	8	19.9	6.1		12	25.2	10.5	30	20.9	8.5	25.0	10.0	13
14				10	16.1	8.0		11	25.0	10.1	21	20.8	10.0	26.8	10.0	14
15				26	19.7	6.2		7	17.1	6.3	33	19.2	6.2	29.0	10.0	15
16				4	18.0	3.9		5	20.8	3.0	9	19.6	3.5	30.1	10.0	16
17				3	22.0	7.2		9	26.0	5.7	12	25.0	6.1	30.0	10.0	17
18								9	24.6	9.9	9	24.6	9.9	29.5	10.0	18
19														28.5	10.0	19
20																20

Table 4 - 2

MODIFIED PUSH-UPS (times)

GIRL

AGE												Japanese norm		AGE	
				นครพนม(๒๕๓๕)								MEAN S.D.			
4				Nakhon Phanom(1992)				Total				10.8 6.0		5	
5												13.0 7.0		6	
6				Ban Nong Geonhoi(1992)											
7				n MEAN S.D.				n MEAN S.D.				15.0 8.0		7	
8				16 9.1 2.4				16 9.1 2.4				17.0 9.0		8	
9				14 10.8 6.1				16 11.9 6.4				18.8 10.0		9	
10				15 7.5 4.2				21 9.2 4.7							
11				15 8.7 4.0				29 11.7 6.4				20.2 10.0		10	
12				Ban Nakrasaeng(1992)				Yasothon(1992)				21.0 10.0		11	
13				16 8.7 6.0				46 14.3 7.7				21.7 10.0		12	
14				n MEAN S.D.				n MEAN S.D.				22.0 10.0		13	
15				15 7.5 4.3				27 13.5 8.3				22.0 10.0		14	
16				18 16.4 8.2				10 6.9 5.6				21.8 10.0		15	
17				26 17.8 5.2				14 9.9 6.2				21.6 10.0		16	
18				15 17.9 4.7				4 14.5 7.0				21.3 10.0		17	
19				2 18.0 7.1				10 5.9 3.1				20.6 10.0		18	
20								11 8.2 5.7				20.0 10.0		19	
								6 4.8 3.9						20	

5. Timed Shuttle Run

Purpose:

To measure speed and agility.

Field Markings:

A distance of 5-meter is divided by drawing parallel lines at intervals of 1-meter. Two touch lines are drawn parallel to the other lines, but a distance of 50-centimeter from the lines marking the ends of the 5-meter distance (see figure).

Equipment and Facilities:

Stop watch.

Procedures:

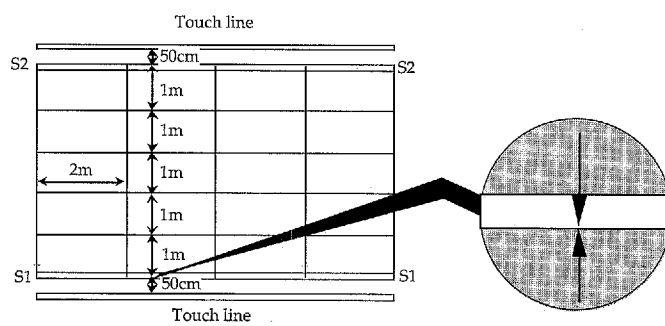
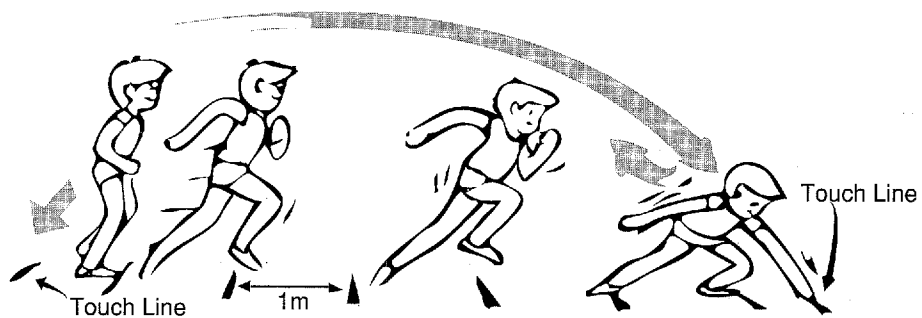
With the signal to "Take Your Mark," the child stands at the starting line (S1). With the signal to "Go," he/she runs to the second line(S2), touches the outside of the S2 line with one hand, and returns as fast as possible to the starting line. Then he/she repeats as S1-S2-S1-S2. The touch must extend over the line or on the outside of the line. The partner counts the repeated touches (number of touches), and checks the position of the front foot on the signal to "Stop." If the examinee hears the signal to "Stop" while his/her hand is over the line, his/her touch will be able to count after touching the line. If the examinee's touch does not reach the line, (position before the line) the front foot closest to the line will be measured at its distance from the line.

Scoring:

The score is based on the maximum distance covered by the participant in 15 seconds. The distance is measured in meters. The score is calculated by counting the number of touches for the 5 meters distance and adding the distance between the last touch line and the front point of the foot point to the number of touches. The score will be taken from the best score out of two runs.

Comments:

An improper touch is not valid and requires the examinee to take the test over again. The examinee must not stop rapidly when the "Stop" signal is given.



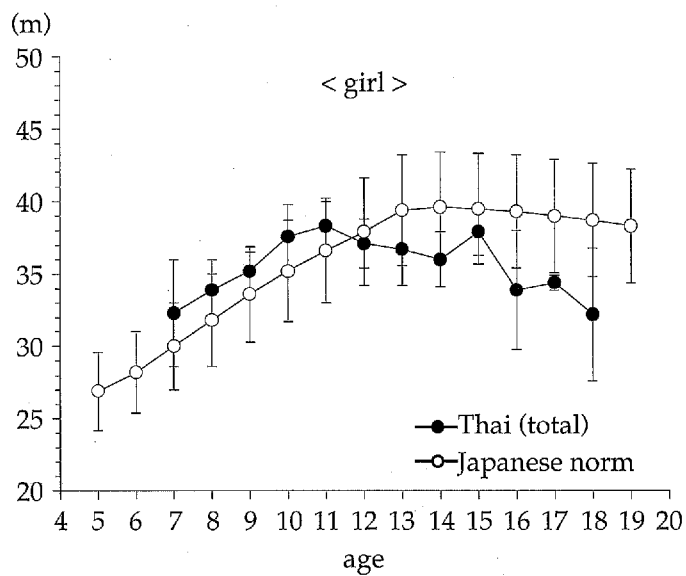
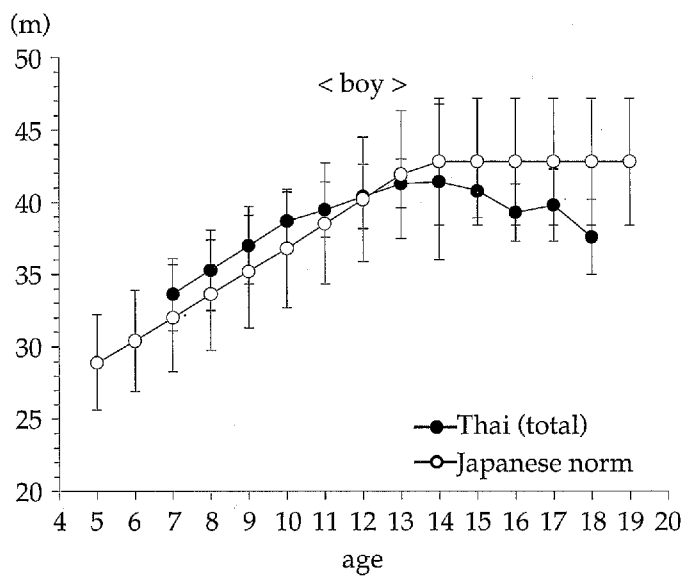


Fig 5 Timed shuttle run

Table 5 - 1

TIMED SHUTTLE RUN (m per 10-second)

BOY

AGE												AGE			
				นครพนม(๒๕๓๕)								Japanese Norm			
4				Ban Nong Geonhoi(1992)				Total				MEAN S.D.			
5				Nakhon Phanom(1992)								28.9 3.3		5	
6												30.4 3.5		6	
7												32.0 3.7		7	
8												33.6 3.8		8	
9												35.2 3.9		9	
10												36.8 4.1		10	
11												38.5 4.2		11	
12												40.2 4.3		12	
13												41.9 4.4		13	
14												42.8 4.4		14	
15												42.8 4.4		15	
16												42.8 4.4		16	
17												42.8 4.4		17	
18												42.8 4.4		18	
19												42.8 4.4		19	
20														20	

Table 5 - 2

TIMED SHUTTLE RUN (m per 10-second)

GIRL

AGE												AGE			
				นครพนม(๒๕๓๕)											
4				Nakhon Phanom(1992)				Total				Japanese Norm			
5	ร.บ้านหนองเงินฮ้อย(๒๕๓๕)											MEAN S.D.			
6	Ban Nong Geonhoi(1992)			n MEAN S.D.				n MEAN S.D.							
7	n MEAN S.D.			16 32.3 3.7				16 32.3 3.7				30.0 3.0			
8	2	36.0	1.4	14 33.6 2.1				16 33.9 2.1				31.8 3.2			
9	6	34.8	2.2	15 35.3 0.8				21 35.2 1.3				33.6 3.3			
10	14	38.6	2.1	ร.บ้านนากระแซง(๒๕๓๕) 15 36.7 2.0				ยโสธร(๒๕๓๕) 29 37.6 2.2				35.2 3.5			
11	30	38.4	1.8	Ban Nakrasaeng(1992) 16 38.0 1.6				Yasothon(1992) 46 38.3 1.7				36.6 3.6			
12	13	36.9	1.5	n MEAN S.D. 15 37.3 1.8				n MEAN S.D. 28 37.1 1.7				37.9 3.7			
13	12	38.4	2.0	18 35.7 2.4				3 35.7 0.6				39.4 3.8			
14				26 36.3 1.8				12 35.2 2.0				39.6 3.8			
15				15 37.9 1.7				2 38.0 0.0				39.5 3.8			
16				2 39.5 2.1				10 32.8 3.4				39.3 3.9			
17								11 34.4 0.5				39.0 3.9			
18								6 32.2 4.6				38.7 3.9			
19												38.3 3.9			
20															

6. 5-Minute Distance Run

Purpose:

To measure maximal functional capacity and cardiorespiratory endurance .

Equipment and Facilities:

A 200-meter track, or any other indoor or outdoor area that is flat and can be easily measured. Also needed are cones or pegs, a stopwatch, and a whistle.

Procedures:

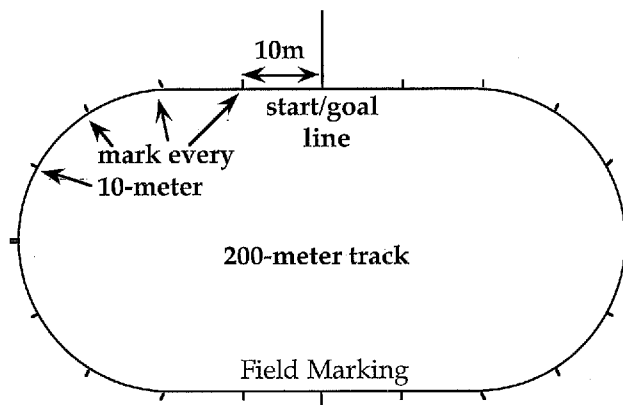
Cones or other markers should be placed around the track to indicate portions of completed laps - e.g., either every 10 meters. All examinees are started together on a signal. They are instructed to try to cover as much distance as possible in the 5 minutes. They are allowed to walk, but should be encouraged to run at an even pace that can be maintained. Runners are given signals when 1, 2, 3 or 4 minutes have passed. At the end of 5 minutes, the test administrator blows a whistle, and the runner notes the last cone he/she has passed.

Scoring:

The score is the distance in 5 minutes.

Comments:

Partners may help the runners keep track of the number of completed laps, so that scoring is accurate.



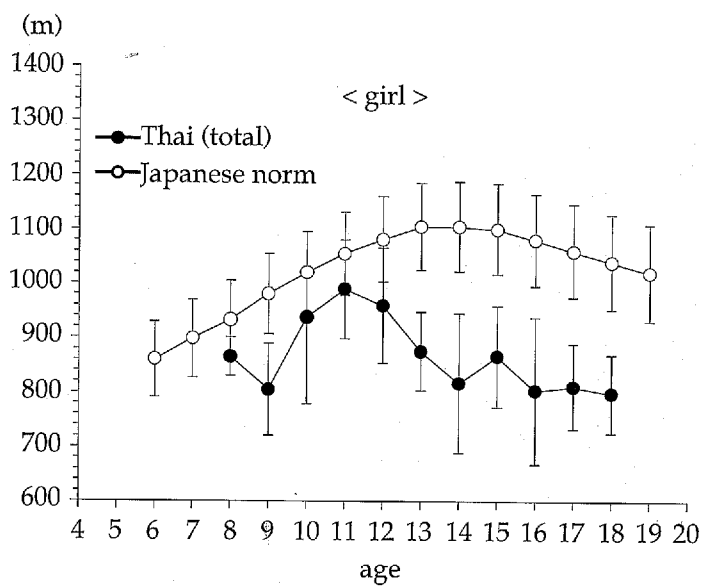
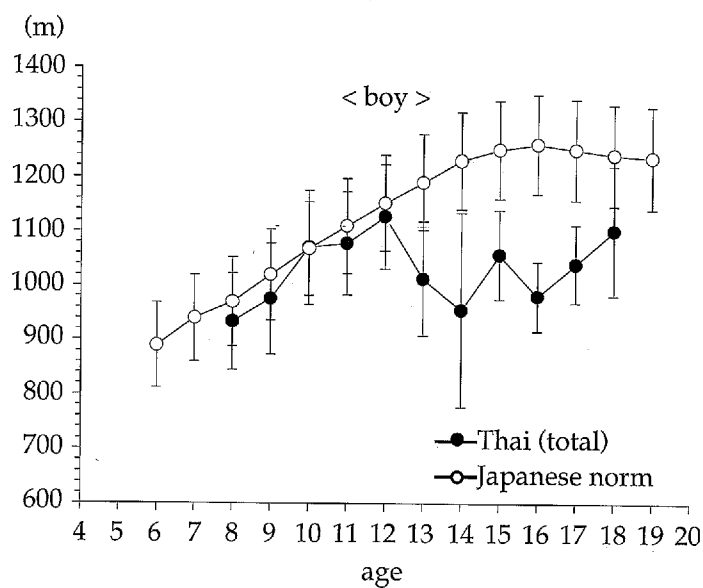


Fig 6 5-minute distance run

Table 6 - 1

5-MINUTE DISTANCE RUN (m)

BOY

AGE												AGE			
4								Japanese Norm				4			
5								<u>MEAN S.D.</u>				5			
6								Total				6			
7								<u>n MEAN S.D.</u>				7			
8								5 934 89				8			
9								7 976 102				9			
10								17 1049 105				10			
11								19 1097 73				11			
12								14 1052 44				12			
13								10 1104 37				13			
14								10 1003 113				14			
15								26 1056 70				15			
16								4 1000 64				16			
17								3 1043 112				17			
18								9 1101 119				18			
19								9 1101 119				19			
20								9 1101 119				20			

Table 6 - 2

5-MINUTE DISTANCE RUN (m)

GIRL

AGE													Japanese Norm		AGE	
4														MEAN	S.D.	4
5	ร.ร.บ้านหนองเงิน้อย(๒๕๓๕)															5
6	Ban Nong Geonhoi(1992)													Total	860 69	6
7	n MEAN S.D.				น.ศ.พนม(๒๕๓๕)				n MEAN S.D.				898 71	7		
8	2	865	35	Nakhon Phanom(1992)				2	865	35	932 73	8				
9	4	805	84	n MEAN S.D.				4	805	84	980 74	9				
10	14	989	186	ร.ร.บ้านนากระแซง(๒๕๓๕)	14	885	105	ยโสธร(๒๕๓๕)	28	937	158	1020 76	10			
11	30	987	64	Ban Nakrasaeng(1992)	16	993	129	Yasothon(1992)	46	989	91	1055 77	11			
12	13	892	50	n MEAN S.D.				15	1017	109	n MEAN S.D.		28 959 106	1081 79	12	
13	12	910	41	18	876	78	10 832 74		40	875	72	1105 80	13			
14				26	855	82	14 747 167		40	817	128	1105 82	14			
15				15	871	92	6 853 104		21	866	93	1100 83	15			
16				2	1005	163	10 763 92		12	803	135	1080 85	16			
17								11	811	78	11	811 78	1060 86	17		
18								6	798	72	6	798 72	1040 88	18		
19												1020 89	19			
20														20		

7. Softball Throw for Distance

Purpose:

To measure the distance a softball can be thrown with accuracy.

Field Markings:

The test administrator draws two lines at an interval of 3-meter. Markings require that the throwing line and other lines be at intervals of 1-meter and at right angles to the two long lines. The throwing line and the lines at intervals of 5-meter are to be made longer than the other lines.

Equipment and Facilities:

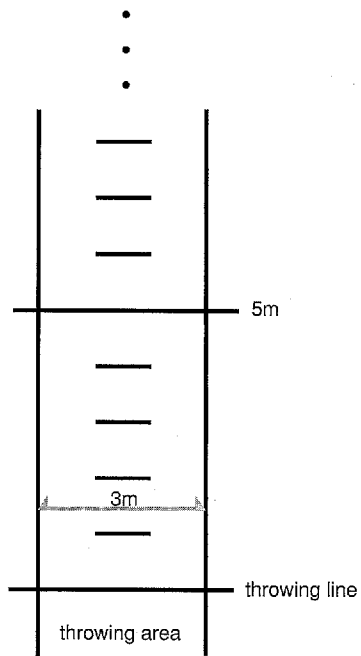
Softball.

Procedure:

The child takes a position in the throwing zone with a softball in hand and throws as far as possible within the 3-meter width. The child may throw with either hand. Players must stretch their arm prior to throwing. The player makes two throws.

Scoring:

A testing assistant stands where the each throw falls down, and call its distance. The best of the 2 throws is the score. If the student crosses over the throwing line when child releases the ball or the ball falls down outside the 3-meter wide area, the throw does not count as one of the two trials, and is not scored.



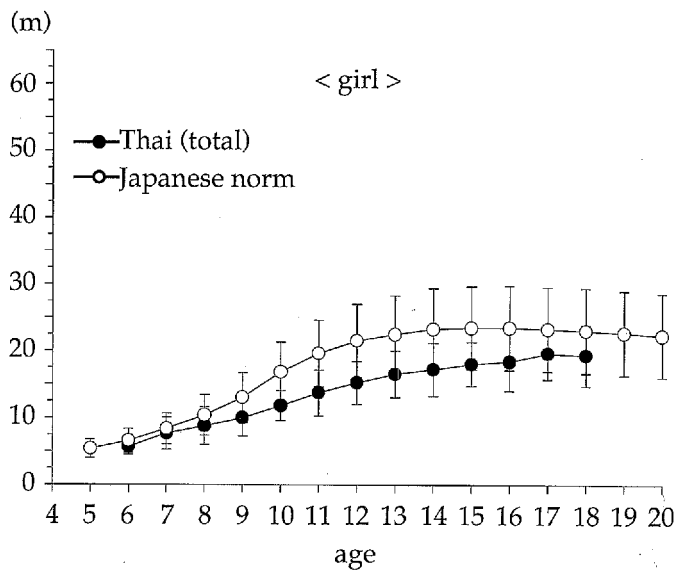
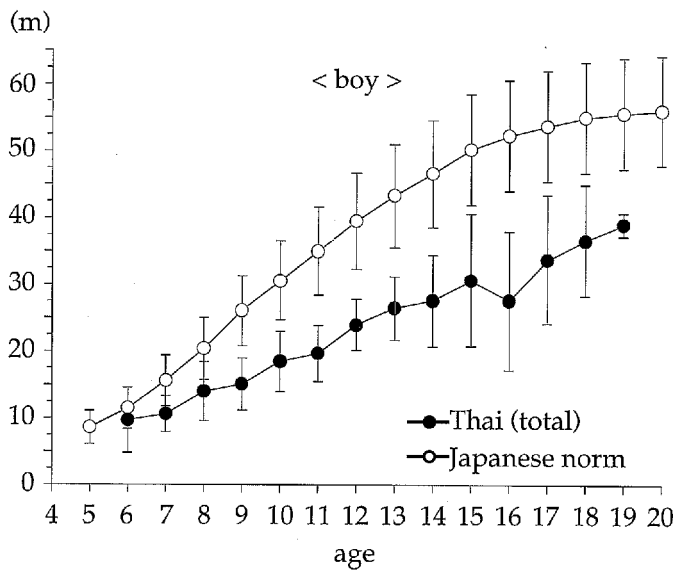


Fig 7 Softball throw for distance

Table 7 - 1

SOFTBALL THROW FOR DISTANCE (m)

BOY

AGE										AGE									
รร.อุบลวิทยาคม(๒๕๓๐)				รร.บ้านหนองเงินฮ้อย(๒๕๓๐)															
4 Ubon Whittayakom(1987)				Ban Nong Geonhoi(1988)								Total							
5 n MEAN S.D.				n MEAN S.D.				รร.วิภาควิทยาการ(๒๕๓๐)				n MEAN S.D.							
6				2 12.5 0.71				Wiphak Witthayakon(1988)				3 9.7 4.9							
7 14 9.3 2.0				12 12.17 2.55				n MEAN S.D.				26 10.6 2.7							
8 27 10.5 2.2				20 18.05 3.9				13 14.9 2.5				60 14.0 4.4							
9 18 13.0 3.3				รร.พิบูลมังสาหาร(๒๕๓๐)				20 16.6 3.2				รร.พิบูลมังสาหาร(๒๕๓๐) 39 15.1 3.9							
10 24 17.4 4.5				Phibun Mangsahan(1987)				20 19.8 4.4				Phibun Mangsahan(1988)44 18.5 4.5							
11 19 18.4 4.1				n MEAN S.D.				16 21.3 3.9				n MEAN S.D. 35 19.7 4.2							
12 12 23.0 4.0				8 22.1 3.6				8 24.1 2.8				23 25.0 3.8 51 24.0 3.8							
13 2 22.0 0.0				21 24.8 3.0				0				34 27.7 5.4 58 26.5 4.8							
14				22 27.4 6.0								18 29.4 4.7 42 27.6 6.9							
15				17 28.2 8.1								13 36.2 6.1 31 30.7 9.9							
16				11 25.6 9.9								2 39.0 5.7 13 27.6 10.4							
17				18 33.8 9.6								18 33.8 9.6							
18				11 36.6 8.3								11 36.6 8.3							
19				3 39.0 1.7								3 39.0 1.7							
20																			

Table 7 - 2

SOFTBALL THROW FOR DISTANCE (m)

BOY

AGE				Japanese norm			AGE
4	Sashima, Japan(1987)			MEAN	S.D.		4
5	n	MEAN	S.D.	8.6	2.5		5
6	35	7.7	2.8	11.5	3.1		6
7	51	10.9	3.9	15.6	3.8		7
8	43	14.9	4.7	20.4	4.6		8
9	32	18.5	5.4	26.1	5.3		9
10	35	21.2	4.6	30.6	5.9		10
11	40	23.6	5.7	35.0	6.6		11
12	6	34.2	4.5	39.5	7.2		12
13				43.3	7.7		13
14				46.6	8.0		14
15				50.2	8.3		15
16				52.3	8.3		16
17				53.7	8.3		17
18				55.0	8.3		18
19				55.6	8.3		19
20				56.0	8.2		20

Table 7 - 3

SOFTBALL THROW FOR DISTANCE (m)

GIRL

AGE													AGE				
	รร.อุบลวิทยาคม(๒๕๓๐)				รร.บ้านหนองเงิน้อย(๒๕๓๐)				Total								
4	Ubon Whittayakom(1987)				Ban Nong Geonhoi(1988) วิทยาลัยการ(๒๕๓๐)								4				
5	<u>n</u> <u>MEAN</u> <u>S.D.</u>				<u>n</u> <u>MEAN</u> <u>S.D.</u>			Wiphak Witthayakon(1988)			<u>n</u> <u>MEAN</u> <u>S.D.</u>			5			
6	3	5.7	1.2		<u>n</u> <u>MEAN</u> <u>S.D.</u>						3	5.7	1.2	6			
7	16	6.3	2.0		17	9.0	1.9	<u>n</u> <u>MEAN</u> <u>S.D.</u>			33	7.7	2.4	7			
8	22	7.0	2.4	รร.พิบูลมังสาหาร(๒๕๓๐)	21	9.3	2.7	18	10.3	2.4	รร.พิบูลมังสาหาร(๒๕๓๐)	61	8.8	2.8	8		
9	25	9.0	2.4	Phibun Mangsahan(1987)				16	11.6	2.4	Phibun Mangsahan(1988)	41	10.0	2.7	9		
10	17	11.8	2.4	<u>n</u> <u>MEAN</u> <u>S.D.</u>				22	11.8	2.1	<u>n</u> <u>MEAN</u> <u>S.D.</u>	39	11.8	2.2	10		
11	21	13.1	2.2	4	12.8	1.5		15	13.3	3.2	7	16.9	5.6	47	13.7	3.4	11
12	12	15.0	2.9	14	14.2	2.7		10	13.9	2.5	24	16.5	3.6	60	15.2	3.2	12
13				20	16.1	3.4					26	17.0	3.6	47	16.5	3.5	13
14				20	16.6	4.0					25	17.7	4.1	45	17.2	4.0	14
15				20	17.5	2.6					12	19.0	4.0	32	18.0	3.3	15
16				22	17.9	3.8								23	18.4	4.4	16
17				28	19.6	3.9								28	19.6	3.9	17
18				10	19.3	4.6								10	19.3	4.6	18
19																	19
20																	20

Table 7 - 4

SOFTBALL THROW FOR DISTANCE (m)

GIRL

AGE				Japanese norm				AGE
				MEAN	S.D.			
4	Sashima, Japan(1987)							4
5	n	MEAN	S.D.					5
6	38	5.0	1.4					6
7	37	7.1	2.2					7
8	46	8.4	2.1					8
9	47	12.4	3.3					9
10	50	16.8	3.5					10
11	38	18.8	5.7					11
12	6	20.0	2.2					12
13								13
14								14
15								15
16								16
17								17
18								18
19								19
20								20

8. Ball Throw for Accuracy.

Purpose:

To measure the ball can be thrown with accuracy.

Field Markings:

The person administering the test sets a target board on a wall. The markings on the test board require 3 concentric circles with radii of 15, 30 and 45 centimeters from the center on the target board. The test administrator also draws a throwing line at a distance of 5 meters from the target board.

Equipment and Facilities:

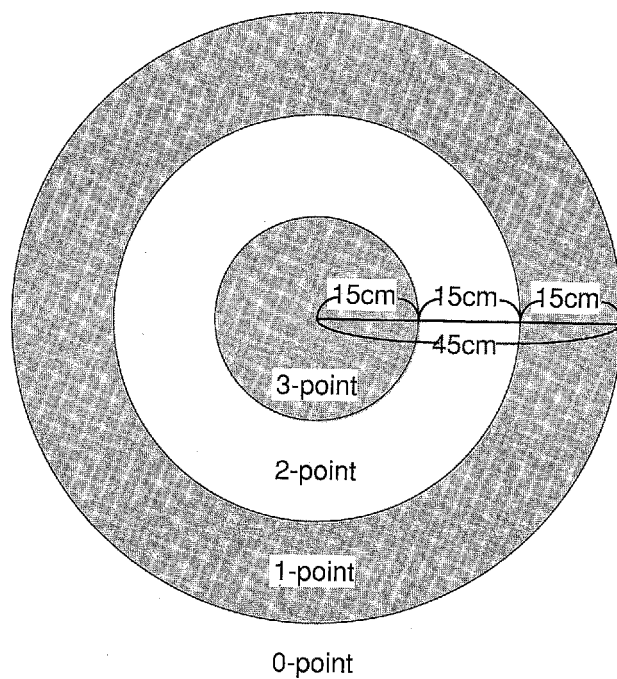
Softball , tennis ball and target board.

Procedure:

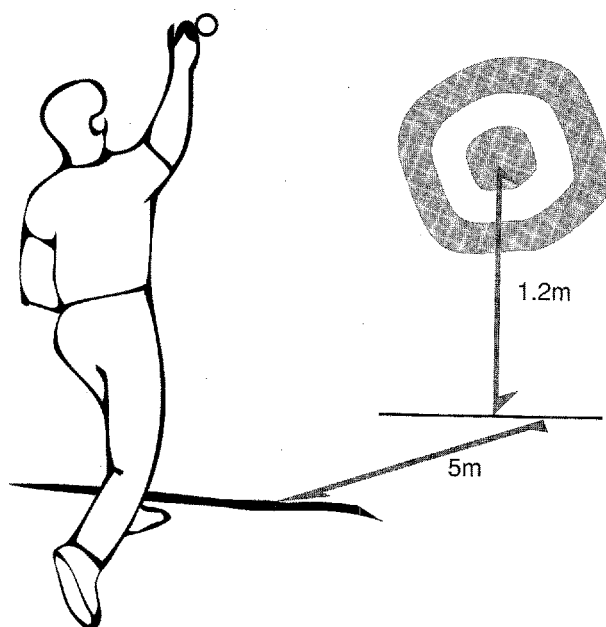
Each student stands behind the throwing line. He/she aims a throw at the center of the board. The student is allow to throw, both, a softball and a tennis ball five at the target.

Scoring:

Shots are scored on a 3, 2 and 1 basis, with 3 points for the inner circle. Missed throwing or those not shooting within any circle are given a zero value. Throwings are measured at the point where they first hit the boad. A shot landing on a line is given the higher of the two values.



Target Marking



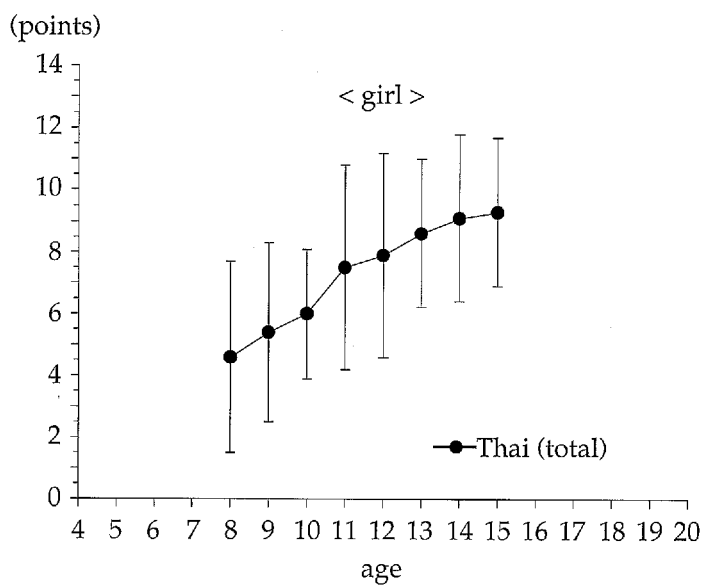
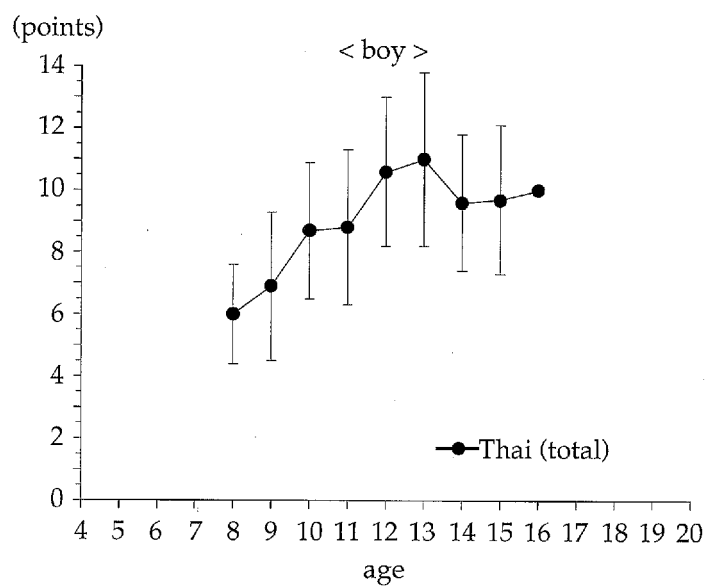


Fig 8-1 Softball throw for accuracy

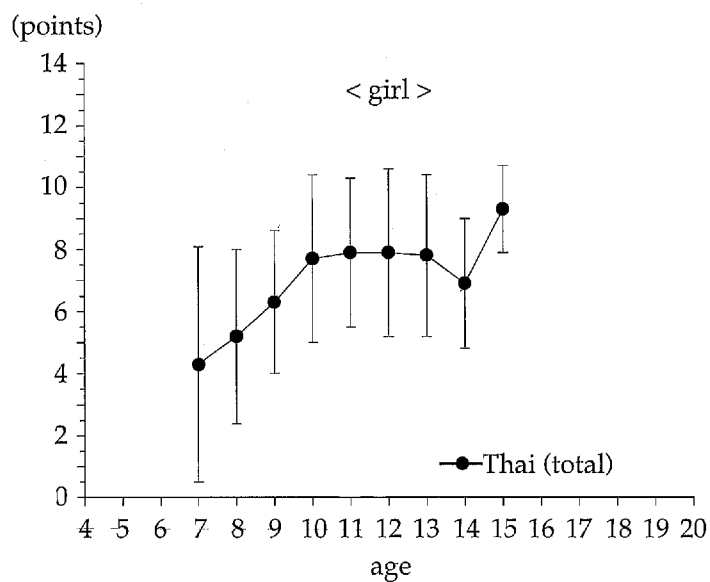
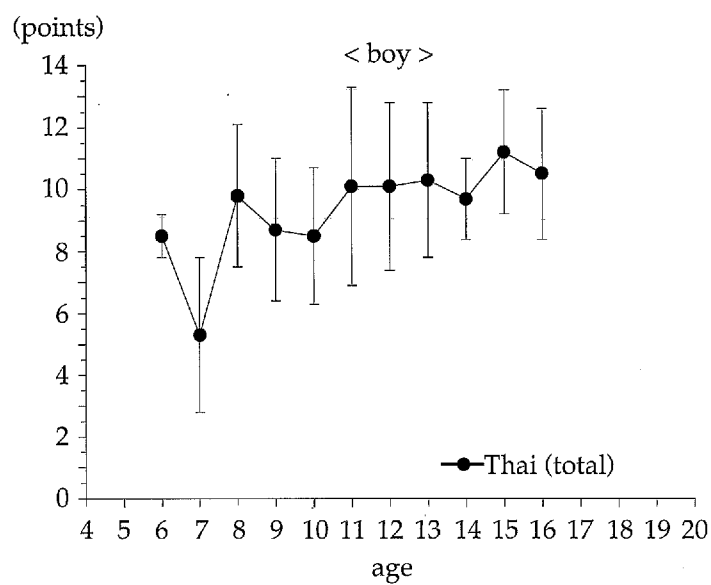


Fig 8-2 Tennis ball throw for accuracy

Table 8 - 1

SOFTBALL THROW FOR ACCURACY (points)

BOY

AGE							AGE
4							4
5	ร.วิภาควิทยาการ(๒๕๓๐)						5
6	Wiphak Witthayakon(1988)						6
7	<u>n MEAN S.D.</u>						7
8	13	6.0	1.6				8
9	20	6.9	2.4	ร.พิบูลมังสาหาร(๒๕๓๐)			9
10	20	8.7	2.2	Phibun Mangsahan(1988)			10
11	16	8.8	2.5	<u>n MEAN S.D.</u>			11
12	8	10.0	2.5	17	10.9	2.3	12
13				23	11.0	2.9	13
14				18	9.6	2.2	14
15				13	9.7	2.4	15
16				2	10.0	0.0	16
17							17
18							18
19							19
20							20

Table 8 - 2

SOFTBALL THROW FOR ACCURACY (points)

GIRL

AGE							AGE
4							4
5	วิทยาลัยวิทยาการ(๒๕๓๐)						5
6	Wiphak Witthayakon(1988)						6
7	n MEAN S.D.			Total			7
8	18	4.6	3.1	วิทยาลัยวิทยาการ(๒๕๓๐)			8
9	16	5.4	2.9	Phibun Mangsahan(1988)			9
10	22	6.0	2.1	n MEAN S.D.			10
11	15	6.7	3.4	7	9.0	2.9	11
12	10	6.6	3.5	24	8.5	3.0	12
13				26	8.6	2.4	13
14				25	9.1	2.7	14
15				12	9.3	2.4	15
16							16
17							17
18							18
19							19
20							20

Table 8 - 3

TENNIS BALL THROW FOR ACCURACY (points)

BOY

AGE											AGE
	ร.ร.บ้านหนองเงินฮ้อย(๒๕๓๐)										
4	Ban Nong Geonhoi(1988)										4
5	n MEAN S.D.			ร.ร.วิภาคย์วิทยากร(๒๕๓๐)			Total				5
6	2	8.5	0.7	Wiphak Witthayakon(1988)			2	8.5	0.7		6
7	12	5.3	2.5	n MEAN S.D.			12	5.3	2.5		7
8	20	10.5	1.9	13	8.6	2.4	33	9.8	2.3		8
9				20	8.5	2.1	21	8.7	2.3		9
10				20	8.5	2.2	20	8.5	2.2		10
11				16	10.1	3.2	16	10.1	3.2		11
12				8	11.4	1.3	17	9.5	3.0		12
13							23	10.1	2.4		13
14							18	9.7	1.3		14
15							13	11.2	2.0		15
16							2	10.5	2.1		16
17											17
18											18
19											19
20											20

Table 8 - 4

TENNIS BALL THROW FOR ACCURACY (points)

GIRL

AGE											AGE
4	ร.บ้านหนองเงินฮ้อย(๒๕๓๐)										4
5	Ban Nong Geonhoi(1988) ร.วิภาควิทยาการ(๒๕๓๐)										5
6	n	MEAN	S.D.	Wiphak Witthayakon(1988)			Total				6
7	17	4.3	3.8	n	MEAN	S.D.	17	4.3	3.8		7
8	21	5.4	3.3	18	5.0	2.1	39	5.2	2.8		8
9				16	6.3	2.3	16	6.3	2.3		9
10				22	7.7	2.7	22	7.7	2.7		10
11				15	8.2	2.2	22	7.9	2.4		11
12				10	8.3	2.4	24	7.9	2.7		12
13							26	7.8	2.6		13
14							25	6.9	2.1		14
15							12	9.3	1.4		15
16											16
17											17
18											18
19											19
20											20

9. Two Handed Shot Put

Purpose:

To measure power.

Equipment and Facilities:

Shot weighing 4.25kg, measurement tape.

Field Markings:

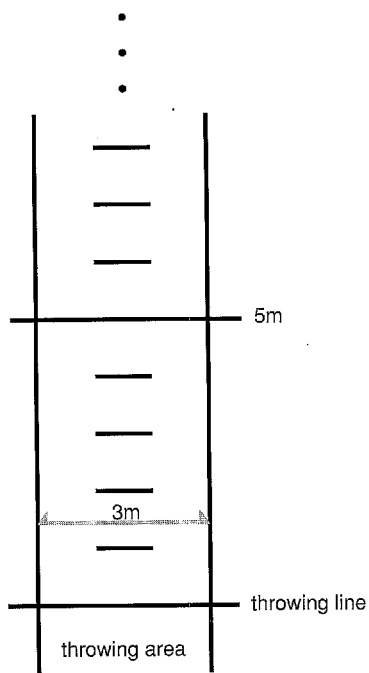
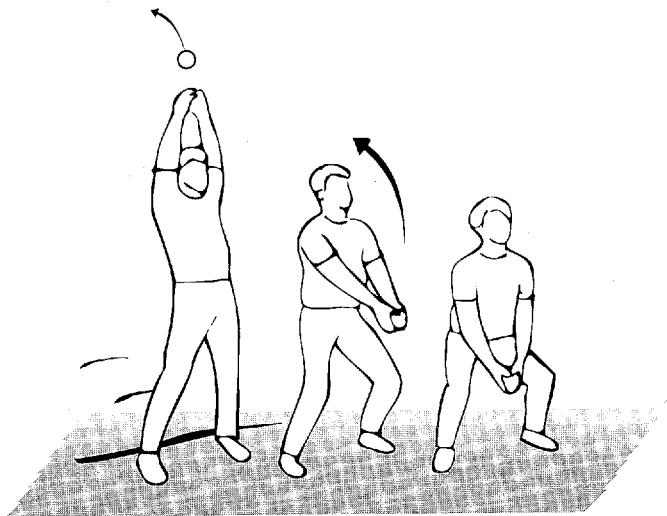
The test administrator draws two lines at interval of 3-meter. Markings require that the throwing line at right angles to the two long lines as shown in the figure. The test administrator for draws lines at 1-meter intervals with a long line drawn a 5-meter interval from the throwing line.

Procedure:

The student takes a position in the throwing area, touching his/her the heel on the throwing line while looking in the oppsite direction of the area where the shot is to be thrown. The stance is to be a shoulder width stance. The participant throws the shot as far as possible over the head toward the measuring area.

Scoring:

The test administers measure the distance where each shot hits the ground in 0.1-meter lengths for the two trials attempted. If the student crosses over the throwing line after throwing or the shot falls down outside the 3-meter wide throwing area, the put is considered a fault and the person is required to do the exercise again.



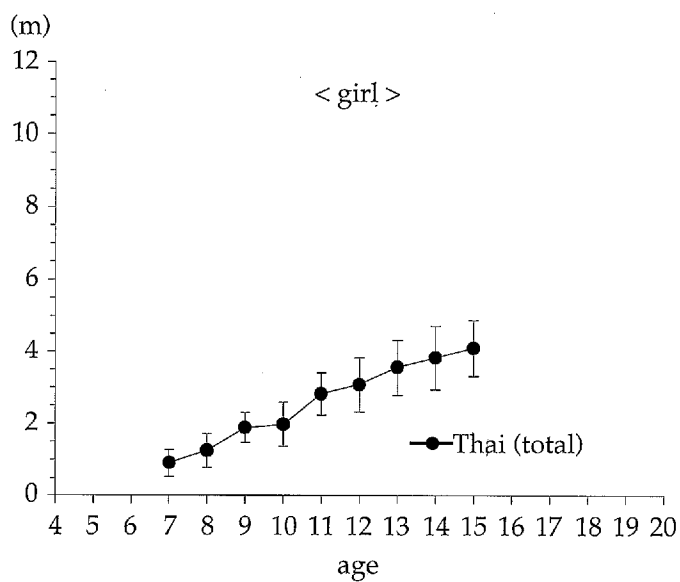
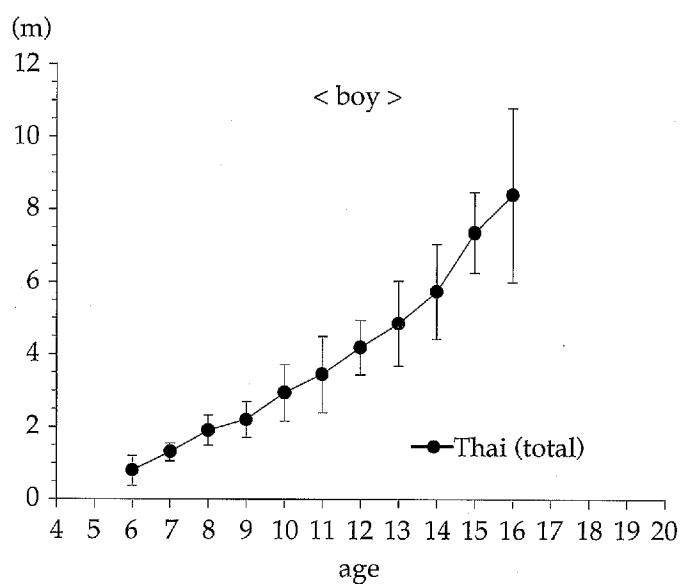


Fig 9 Two handed shot put

Table 9 -1

BOTH HANDS SHOT PUT (m)

BOY

AGE													AGE
	รร.บ้านหนองเงินชัย(๒๕๓๐)												
4	Ban Nong Geonhoi(1988)						Total						4
5	n MEAN S.D.			รร.วิภาควิทยากร(๒๕๓๐)			n MEAN S.D.						5
6	2	0.80	0.42	Wiphak Witthayakon(1988)			2	0.80	0.42				6
7	12	1.32	0.25	n MEAN S.D.			12	1.32	0.25				7
8	20	1.80	0.29	13	2.10	0.50	33	1.92	0.41				8
9				19	2.21	0.48	รร.พิบูลมังสาหาร(๒๕๓๐)			20	2.22	0.48	9
10				20	2.95	0.77	Phibun Mangsahan(1988)			20	2.95	0.77	10
11				16	3.46	1.05	n MEAN S.D.			16	3.46	1.05	11
12				8	4.12	0.50	23	4.23	0.83	31	4.20	0.75	12
13							34	4.87	1.19	35	4.86	1.17	13
14							18	5.74	1.31	18	5.74	1.31	14
15							13	7.36	1.11	13	7.36	1.11	15
16							2	8.40	2.40	2	8.40	2.40	16
17													17
18													18
19													19
20													20

Table 9 - 2

BOTH HANDS SHOT PUT (m)

GIRL

AGE														AGE	
4	ร.บ้านหนองเงิน้อย(๒๕๓๐)														4
5	Ban Nong Geonhoi(1988)วิทยาลัยการ(๒๕๓๐)										Total				5
6	<u>n MEAN S.D.</u>			Wiphak Witthayakon(1988)							<u>n MEAN S.D.</u>			6	
7	17	0.91	0.38	<u>n MEAN S.D.</u>							17	0.91	0.38	7	
8	21	1.07	0.49	18	1.48	0.36	ร.พิบูลมังสาหาร(๒๕๓๐)				39	1.26	0.48	8	
9				14	1.90	0.42	Phibun Mangsahan(1988)				14	1.90	0.42	9	
10				17	1.99	0.61	<u>n MEAN S.D.</u>			17	1.99	0.61	10		
11				14	2.73	0.46	7	3.04	0.79	21	2.83	0.59	11		
12				10	2.92	0.29	24	3.16	0.86	34	3.09	0.74	12		
13							26	3.57	0.76	26	3.57	0.76	13		
14							25	3.84	0.89	25	3.84	0.89	14		
15							12	4.11	0.78	12	4.11	0.78	15		
16													16		
17													17		
18													18		
19													19		
20													20		

10. Volleyball Hitting

Purpose:

To measure the volleyball can be hit with distance and accuracy.

Field Markings:

Markings require that two long lines be at an interval of 3-meter. The tester draws a hitting line as shown in the figure. The tester, then, draws lines at 1-meter intervals with a long line drawn at a 5-meter interval from the hitting line.

Equipment and Facilities:

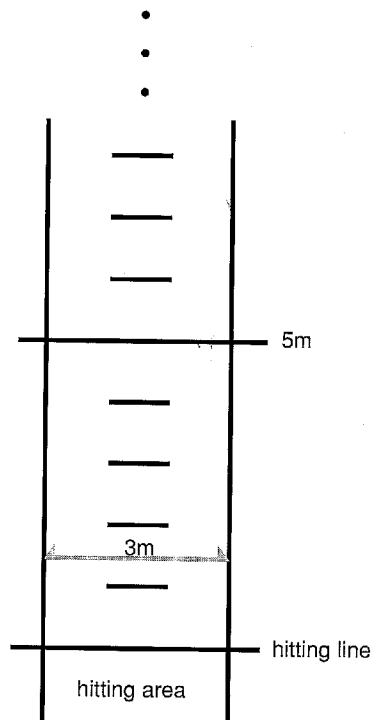
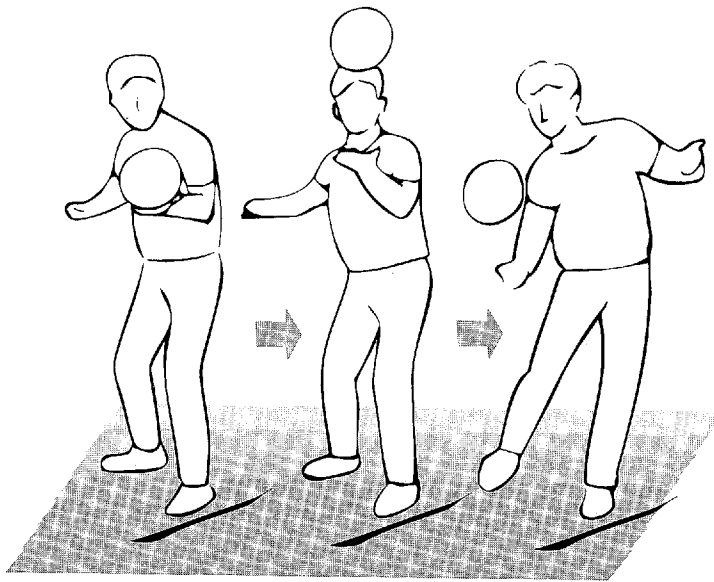
Volleyball.

Procedure:

The child takes a position in the hitting area with a volleyball in a hand. He/she toss up a volleyball and hit as far as possible within the 3-meter width. The child may hit with either hand. The player makes two hits.

Scoring:

A testing assistant stands where the each hit falls down, and call its distance. The best of the two hits is the score. If the student crosses over the hitting line when the child hits the ball or the ball falls down outside the 3-meter wide area, the hit does not count as one of the two trials, and is not scored.



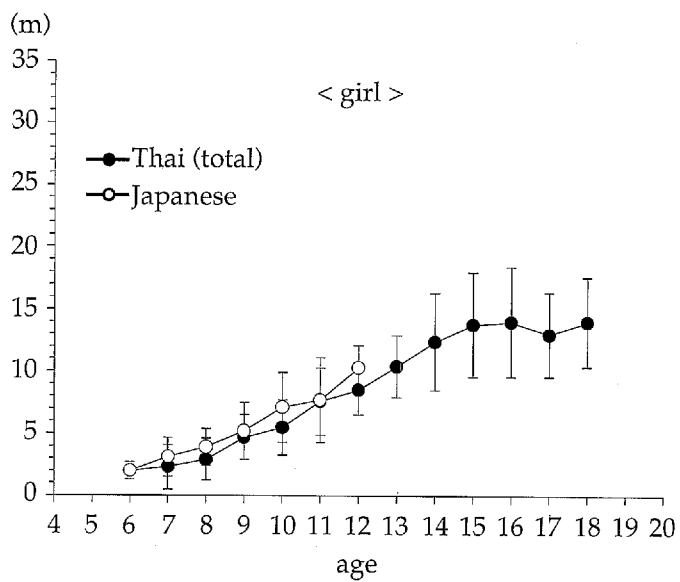
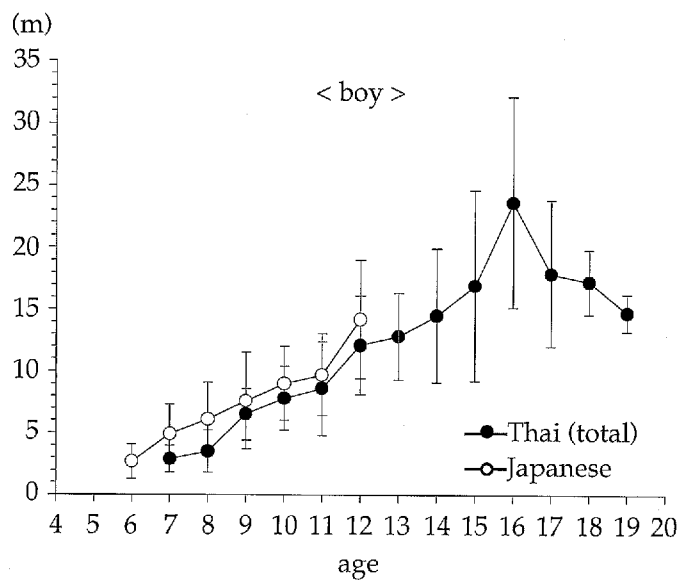


Fig 10 Volleyball hitting

Table 10 - 1

VOLLEYBALL HITTING (m)

BOY

AGE				AGE			
4	ร.ร.อุบลวิทยาคม(๒๕๓๐)			Sashima, Japan(1987)			4
5	Ubon Whittayakom(1987)			Total			5
6	n	MEAN	S.D.	n	MEAN	S.D.	6
7	14	2.9	1.1	14	2.9	1.1	7
8	27	3.5	1.7	27	3.5	1.7	8
9	18	6.5	2.1	18	6.5	2.1	9
10	24	7.8	2.6	24	7.8	2.6	10
11	19	8.6	3.8	19	8.6	3.8	11
12	12	12.7	3.7	20	12.1	4.0	12
13	2	14.0	2.8	23	12.8	3.5	13
14				24	14.5	5.4	14
15				18	16.9	7.7	15
16				11	23.6	8.5	16
17				17	17.9	5.9	17
18				11	17.2	2.6	18
19				3	14.7	1.5	19
20							20

Table 10 - 2

VOLLEYBALL HITTING (m)

GIRL

AGE													AGE
	ร.ร.อุบลวิทยาคม(๒๕๓๐)												
4	Ubon Whittayakom(1987)						Total			Sashima, Japan(1987)			4
5	<u>n MEAN S.D.</u>						<u>n</u>	<u>MEAN</u>	<u>S.D.</u>	<u>n</u>	<u>MEAN</u>	<u>S.D.</u>	5
6	3	2.0	0.0				3	2.0	0.0	38	2.0	0.7	6
7	15	2.3	1.8				15	2.3	1.8	37	3.1	1.6	7
8	22	2.9	1.7	ร.ร.พิบูลมังสาหาร(๒๕๓๐)			22	2.9	1.7	46	3.9	1.5	8
9	25	4.7	1.8	Phibun Mangsahan(1987)			25	4.7	1.8	47	5.2	2.3	9
10	17	5.5	2.2	<u>n MEAN S.D.</u>			17	5.5	2.2	49	7.1	2.8	10
11	21	7.4	2.9	4	8.3	1.3	25	7.6	2.7	37	7.7	3.4	11
12	12	7.7	2.3	14	9.3	1.4	26	8.5	2.0	6	10.3	1.8	12
13				20	10.5	2.5	21	10.4	2.5				13
14				20	12.4	3.9	20	12.4	3.9				14
15				20	13.8	4.2	20	13.8	4.2				15
16				22	14.0	4.4	22	14.0	4.4				16
17				28	13.0	3.4	28	13.0	3.4				17
18				10	14.0	3.6	10	14.0	3.6				18
19													19
20													20

11. Soccerball Punt

Purpose:

This test measures kicking power with accuracy.

Field Markings:

The test administrator draws two lines at an interval of 3-meter. Markings require that the kicking line and other lines be at intervals of 1-meter as shown in the figure. The kicking line and the lines at intervals of 5-meter are to be made longer than the other lines.

Equipment and Facilities:

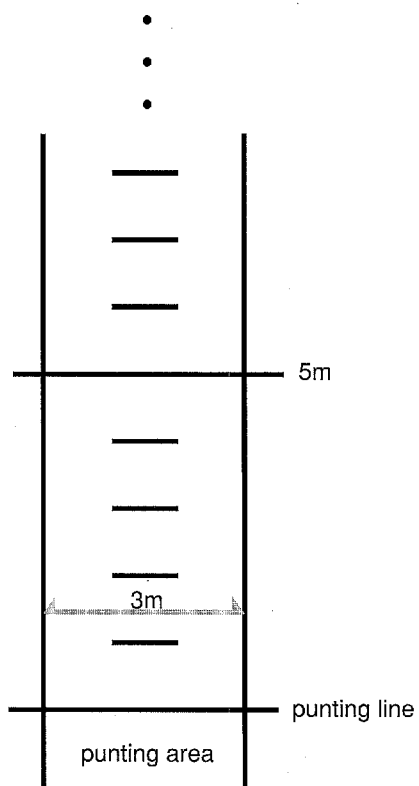
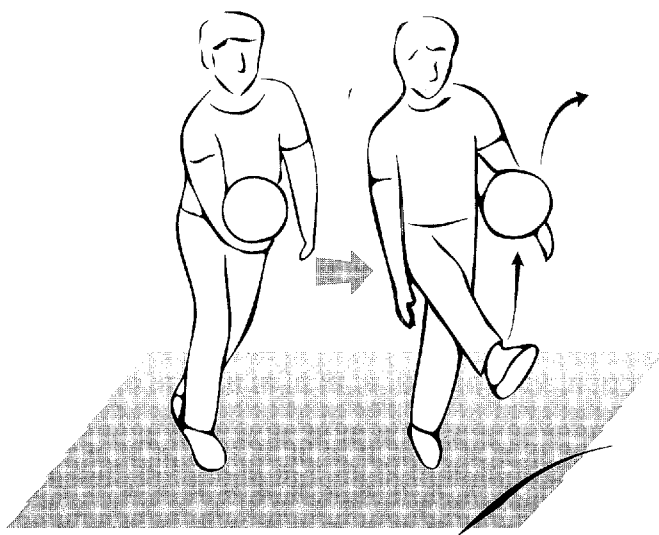
Soccerball.

Procedure:

The student stands the desired distance behind the restraining line. He/she approaches the line and punts the ball as far as possible, being careful not to cross over the restraining line. The child may hit with either foot. The player makes two punts. He/she is allow to hold with, both, a hand and hands.

Scoring:

A testing assistant stands where the each hit falls down, and call its distance. The best of the two hits is the score. If the student crosses over the punting line when the child hits the ball or the ball falls down outside the 3-meter wide area, the hit does not count as one of the two trials, and is not scored.



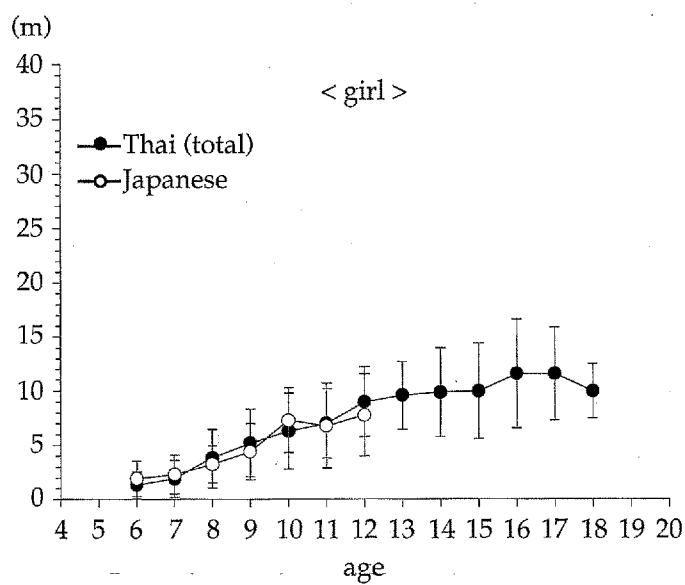
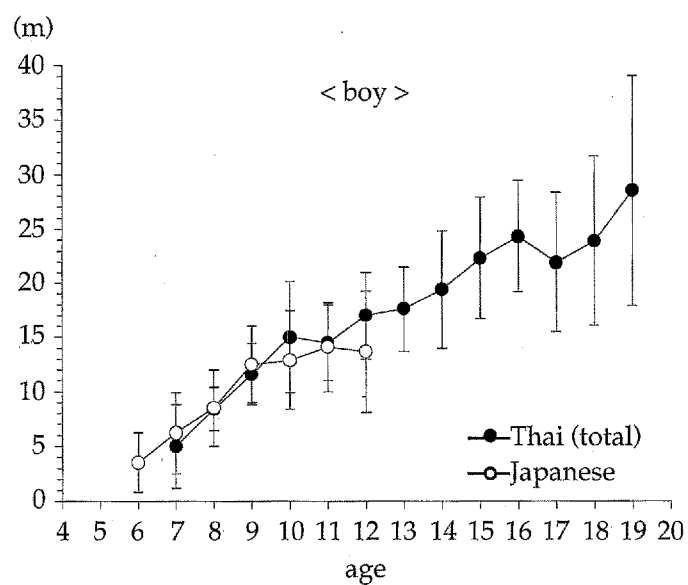


Fig 11 Soccerball punt

Table 11 - 1

SOCCERBALL PUNT (m)

BOY

AGE							AGE						
4	รร.อุบลวิทยาคม(๒๕๓๐)						Sashima, Japan(1987)						4
5	Ubon Whittayakom(1987)						Total			<u>n MEAN S.D.</u>			5
6	<u>n MEAN S.D.</u>						<u>n MEAN S.D.</u>						6
7	14	5.0	3.8				14	5.0	3.8	30	3.5	2.7	7
8	27	8.4	2.0				27	8.4	2.0	42	8.5	3.5	8
9	18	11.6	2.8	รร.พิบูลมังสาหาร(๒๕๓๐)			18	11.6	2.8	30	12.5	3.5	9
10	24	15.0	5.1	Phibun Mangsahan(1987)			24	15.0	5.1	34	12.9	4.5	10
11	19	14.5	3.5	<u>n MEAN S.D.</u>			19	14.5	3.5	40	14.1	4.1	11
12	12	17.5	2.8	8	16.1	5.4	20	17.0	4.0	6	13.7	5.6	12
13	2	21.0	1.4	21	17.2	3.9	23	17.6	3.9				13
14				23	19.4	5.5	24	19.4	5.4				14
15				18	22.3	5.6	18	22.3	5.6				15
16				11	24.3	5.1	11	24.3	5.1				16
17				17	21.9	6.4	17	21.9	6.4				17
18				9	23.9	7.8	9	23.9	7.8				18
19				2	28.5	10.6	2	28.5	10.6				19
20													20

Table 11 - 2

SOCCERBALL PUNT (m)

GIRL

AGE													AGE
	รร.อุบลวิทยาคม(๒๕๓๐)												
4	Ubon Whittayakom(1987)						Total			Sashima, Japan(1987)			4
5	n MEAN S.D.						n	MEAN	S.D.	n	MEAN	S.D.	5
6	3	1.3	1.2				3	1.3	1.2	34	1.9	1.6	6
7	16	1.9	1.7				16	1.9	1.7	33	2.3	1.8	7
8	22	3.8	2.7	รร.พิบูลมังสาหาร(๒๕๓๐)			22	3.8	2.7	45	3.2	1.7	8
9	25	5.2	3.1	Phibun Mangsahan(1987)			25	5.2	3.1	44	4.4	2.6	9
10	17	6.3	3.5	n MEAN S.D.			17	6.3	3.5	50	7.3	3.0	10
11	21	6.7	3.3	4	8.5	2.4	25	7.0	3.2	38	6.8	3.9	11
12	12	7.9	3.3	14	10.0	2.8	26	9.0	3.2	6	7.8	3.8	12
13				19	9.8	3.1	20	9.6	3.1				13
14				20	9.9	4.1	20	9.9	4.1				14
15				20	10.0	4.4	20	10.0	4.4				15
16				22	11.6	5.0	22	11.6	5.0				16
17				28	11.6	4.3	28	11.6	4.3				17
18				10	10.0	2.5	10	10.0	2.5				18
19													19
20													20

12. Soccerball Lifting

Purpose:

To measure the skill with which a player can lift a ball with control exhibited by the legs.

Equipment and Facilities:

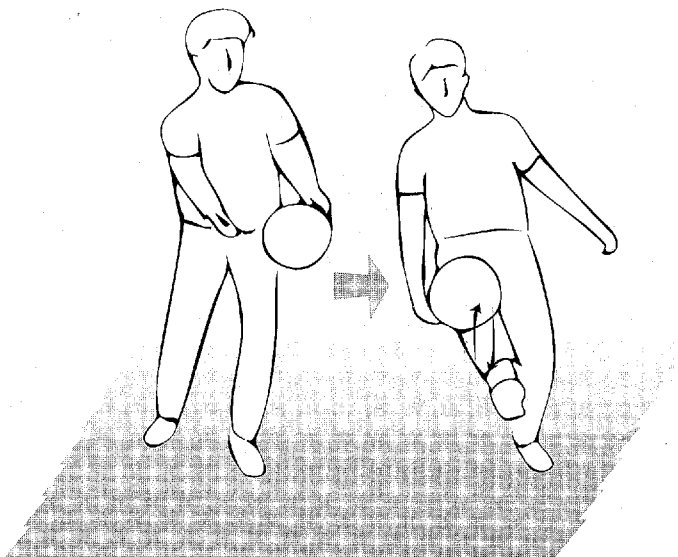
Soccerball .

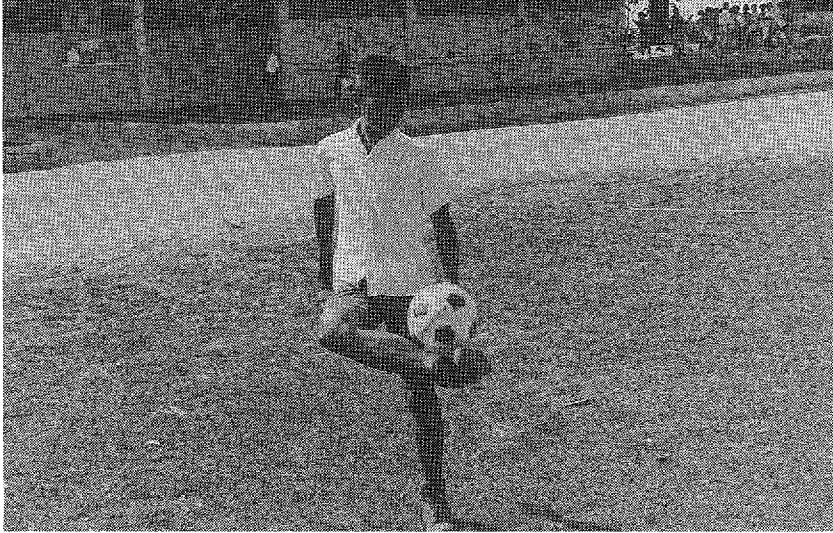
Procedure:

The student first holds a ball, and then drops the ball. He/she lifts the dropped ball with feet and/or knees. The child can use both feet and change feet if needed.

Scoring:

One point is scored when the child lifts or hits the ball. A perfect score is consists of continuous lifting of the ball for ten times. If he/she can not lift the ball ten times continuously, the number of times the ball was lifted will be recorded. The score is an average of the times taken from five trials.





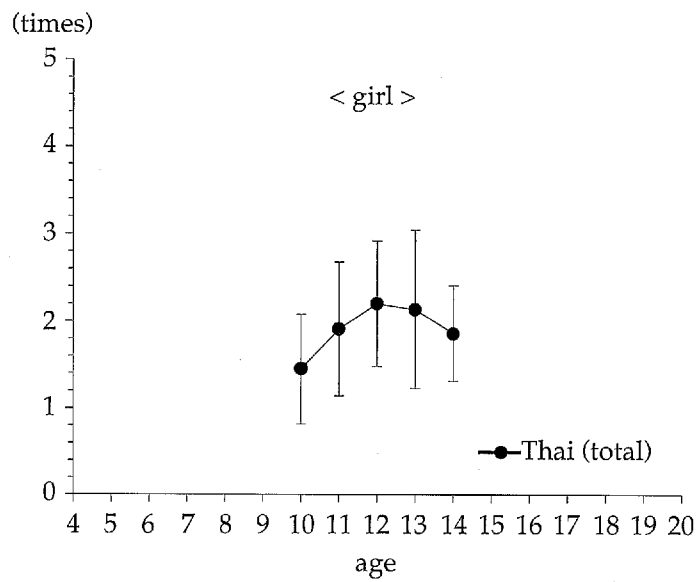
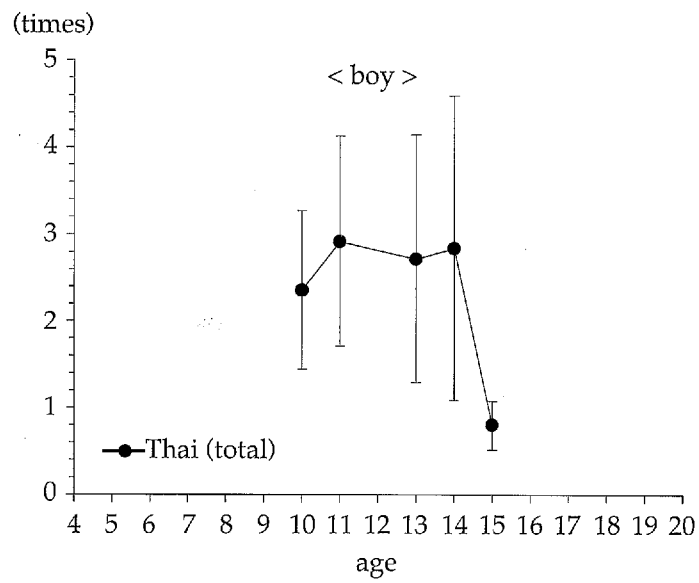


Fig 12 Soccerball lifting

Table 12 - 1

SOCCERBALL LIFTING (times)

BOY

AGE											AGE
4											4
5											5
6											6
7											7
8	รร.เมืองทอง(๒๕๓๓)		รร.วิภาควิทยาการ(๒๕๓๓)								8
9	Ban Mong Tong(1990)		Wiphak Witthayakon(1990)				Total				9
10	<u>n MEAN S.D.</u>		<u>n MEAN S.D.</u>		<u>n MEAN S.D.</u>		<u>n MEAN S.D.</u>		<u>n MEAN S.D.</u>		10
11	41	3.07 1.24	รร.เดชอุดม(๒๕๓๓)	17	2.36 0.91	รร.พิบูลมังสาหาร(๒๕๓๓)	17	2.36 0.91			11
12			Dej Udom(1990)	23	2.65 1.13	Pibun Mangsaharn(1990)	64	2.92 1.21			12
13			<u>n MEAN S.D.</u>			<u>n MEAN S.D.</u>					13
14			4 2.25 1.89			30 2.79 1.38					14
15			33 2.92 1.62			7 2.49 2.39					15
16			2 0.80 0.28								16
17											17
18											18
19											19
20											20

Table 12 - 2

SOCCERBALL LIFTING (times)

GIRL

AGE											AGE
4											4
5											5
6											6
7											7
8											8
9											9
10											10
11											11
12											12
13											13
14											14
15											15
16											16
17											17
18											18
19											19
20											20

13. Soccerball Zigzag Dribbling

Purpose:

To measure the skill with which a player can dribble a soccerball by controlling the ball with both feet.

Equipment and Facilities:

Five cones, soccerball and stopwatch..

Field Markings:

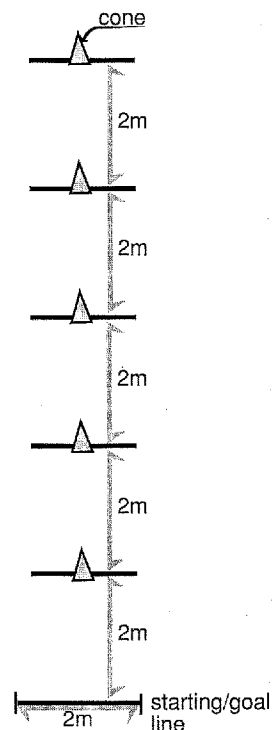
The test administrator draws the starting line and the goal line in 2 meter lengths (see figure). 5 cones are placed at 2 meter intervals from the starting line and the goal line. Cones are placed at right angles to the starting line and the goal line.

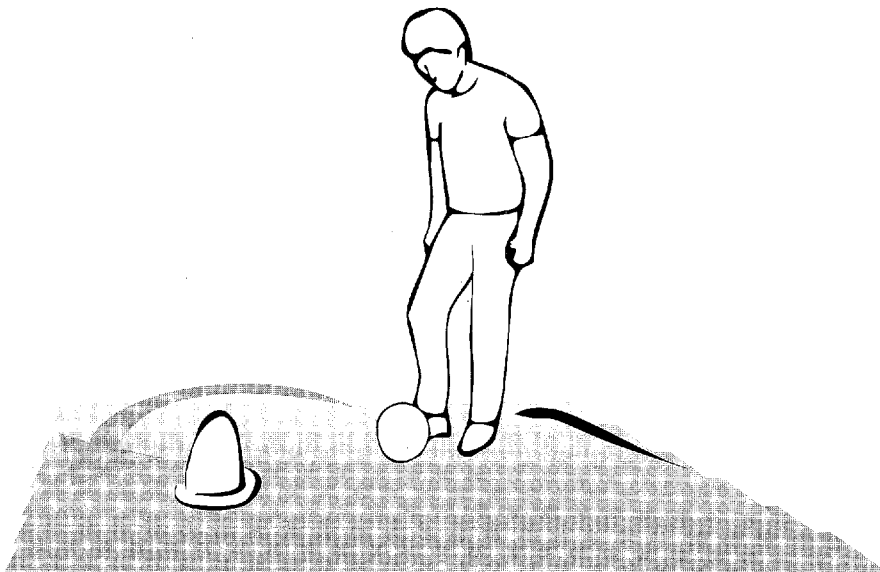
Procedure:

The ball is placed on the starting line. On the signal, "Ready, Go!", the subject dribbles the ball by weaving among the plastic cones until reaching to the tail corn, and returns to the goal line with same way. He/she can round the first cone at either side.

Scoring:

The time is measured from the signal "Go" to the time when the student crosses over the goal line. Time is measured in seconds and tenths of a second for the two trials.





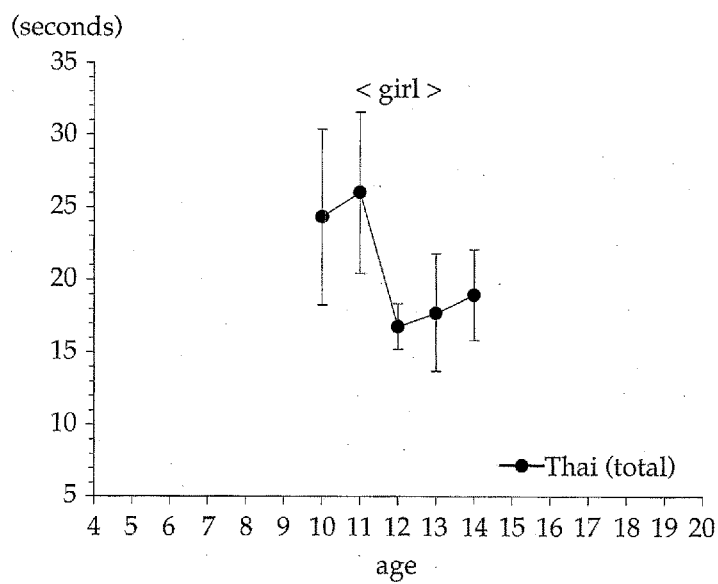
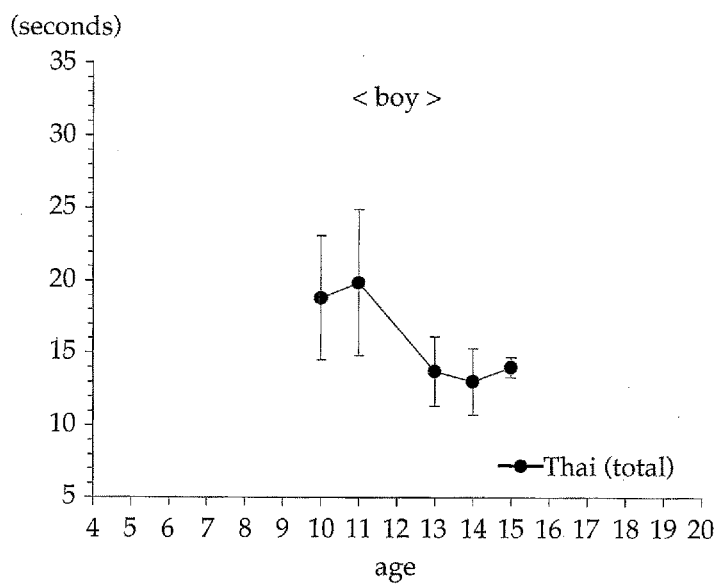


Fig 13 Soccerball zigzag dribble

Table 13 - 1

SOCCERBALL ZIGZAG DRIBBLING (second)

BOY

AGE											AGE
4											4
5											5
6											6
7	รร.วิภาควิทยาการ(๒๕๓๓)										7
8	รร.เมืองทอง(๒๕๓๓)										8
9	Ban Mong Tong(1990)										9
	n MEAN S.D.			n MEAN S.D.			n MEAN S.D.				
10	41	19.54	4.49	17	18.79	4.30	17	18.79	4.30	10	
11				23	20.42	6.00	64	19.86	5.05	11	
12										12	
13				4	12.30	1.45	30	13.92	2.41	13	
14				33	13.00	2.38	40	13.02	2.27	14	
15				2	14.00	0.71	2	14.00	0.71	15	
16											16
17											17
18											18
19											19
20											20

Table 13 - 2

SOCCERBALL ZIGZAG DRIBBLING (second)

GIRL

AGE											AGE							
4											4							
5											5							
6											6							
7	รร.วิภาคย์วิทยากร(๒๕๓๓)										7							
8	รร.หมื่นทอง(๒๕๓๓)			Wiphak Witthayakon(1990)				Total			8							
9	Ban Mong Tong(1990)			<u>n MEAN S.D.</u>			รร.พิบูลมังสาหาร(๒๕๓๓)			<u>n MEAN S.D.</u>	9							
10	<u>n</u>	<u>MEAN</u>	<u>S.D.</u>	รร.เทพอุดม(๒๕๓๓)			26	24.75	5.79	Pibun Mangsaharn(1990)			27	24.33	6.07	10		
11	40	26.55	5.52	Dej Udom(1990)			10	23.95	5.56	<u>n MEAN S.D.</u>			50	26.03	5.57	11		
12				<u>n MEAN S.D.</u>						<u>n MEAN S.D.</u>			6	16.80	1.57	12		
13				7 19.99 2.09						5 17.20 1.37			32	17.74	4.04	13		
14				32 20.03 2.72						24 16.46 2.78			44	18.98	3.11	14		
15											12 16.18 2.29							15
16																	16	
17																	17	
18																	18	
19																	19	
20																	20	

14. Ball Batting

Purpose:

To measure the skill with which a player can hit a tossed ball.

Equipment and Facilities:

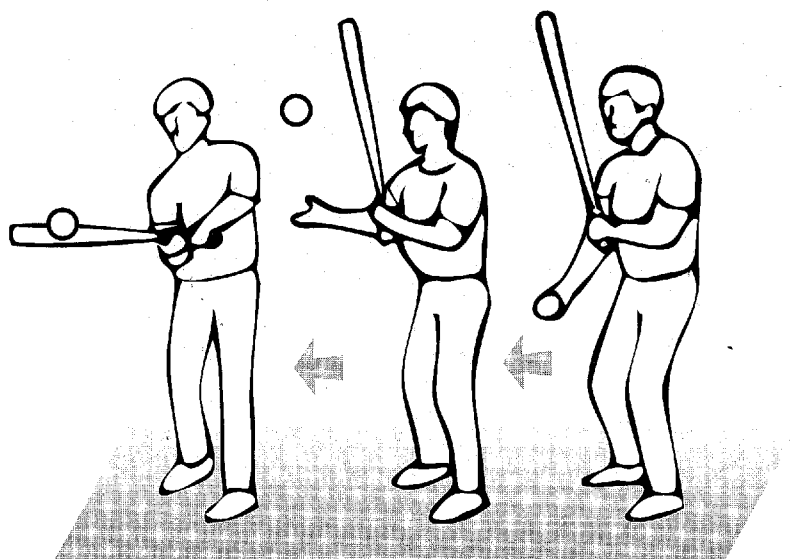
Bat for baseball and soft ball (tennis ball).

Procedure:

The student stands in the batting area with a tennis ball and a bat in each hand. He/she tosses the tennis ball with either hand and proceeds to hit the tossed ball with a bat driped by both hands.

Scoring:

A hit ball receives one point. A missed attempt to hit the ball is scored as a zero. Total points are scored after five trials by the hitter.





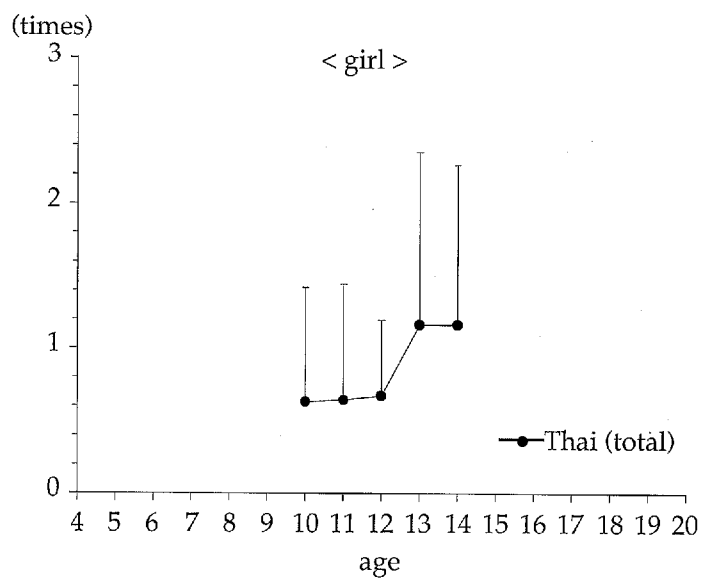
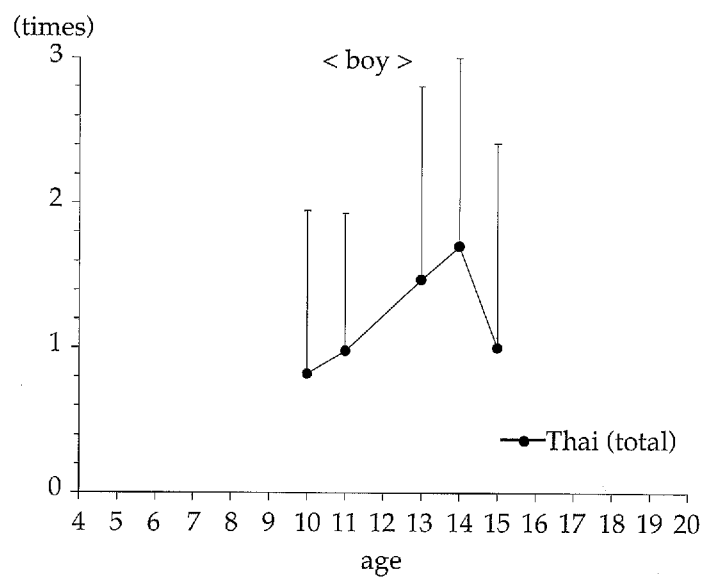


Fig 14 Ball batting

Table 14 - 1 BALL BATTING (times per 5-trial)

BOY

AGE							AGE
4							4
5							5
6							6
7							7
8	รร.หม่องทอง(๒๕๓๓)		รร.วิภาคย์วิทยากร(๒๕๓๓)			Total	8
9	Ban Mong Tong(1990)		Wiphak Witthayakon(1990)				9
10	n	MEAN	S.D.	n	MEAN	S.D.	10
11	41	0.98	0.91	รร.เดชอุดม(๒๕๓๓)	17	0.82 1.13	11
12				Dej Udom(1990)	23	1.00 1.04	12
13					รร.พิบูลมังสาหาร(๒๕๓๓)		13
14					Pibun Mangsaharn(1990)		14
15				n	MEAN	S.D.	15
16				4	0.25	0.50	16
17				33	1.73	1.42	17
18				2	1.00	1.41	18
19							19
20							20

Table 14 - 2

BALL BATTING (times per 5-trial)

GIRL

AGE										AGE									
4										4									
5										5									
6										6									
7										7									
8										8									
9										9									
10										10									
11										11									
12										12									
13										13									
14										14									
15										15									
16										16									
17										17									
18										18									
19										19									
20										20									

รร.หม่องทอง(๒๕๓๓)										รร.วิภาควิทยาการ(๒๕๓๓)										รร.พิบูลมังสาหาร(๒๕๓๓)										Total									
Ban Mong Tong(1990)										Wiphak Witthayakon(1990)										Pibun Mangsaharn(1990)																			
n MEAN S.D.										n MEAN S.D.										n MEAN S.D.										n MEAN S.D.									
40 0.65 0.86										26 0.62 0.80										27 0.63 0.79										27 0.63 0.79									
Dej Udom(1990)										10 0.60 0.52										50 0.64 0.80										50 0.64 0.80									
n MEAN S.D.										n MEAN S.D.										n MEAN S.D.										n MEAN S.D.									
7 1.43 1.40										5 0.60 0.55										6 0.67 0.52										6 0.67 0.52									
32 0.94 0.88										24 1.13 1.15										32 1.16 1.19										32 1.16 1.19									
										12 1.75 1.42										44 1.16 1.10										44 1.16 1.10									

15. Rope Skipping

Purpose:

To measure the skill with which a person can skip a rope.

Equipment and Facilities:

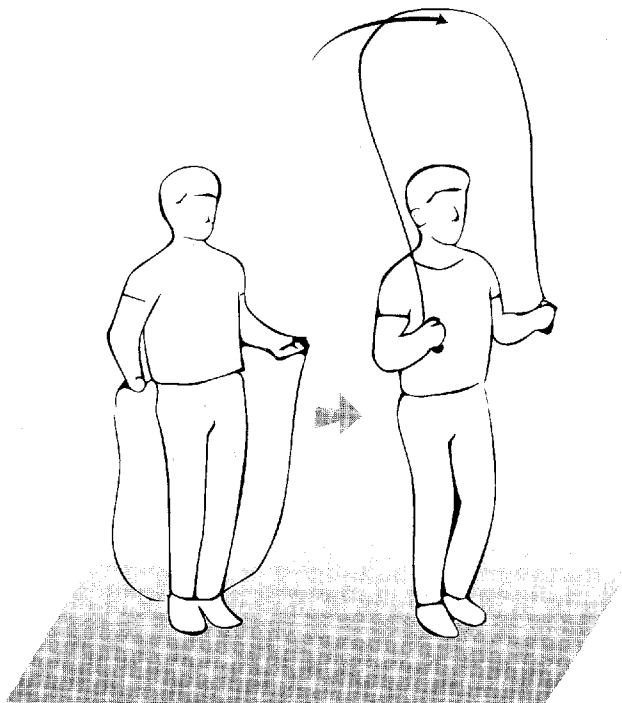
Vinyl rope.

Procedure:

On the signal, "Ready," the examinee holds the rope and stands front of rope. On the signal, "Go," the child skips the rope as fast as possible while turning the rope forward. The tester counts up to 10 seconds and says "Stop." The partner counts the number of times the rope was skipped in 10 seconds.

Scoring:

The examinee has two chances to take the test. If the child can not skip the rope, the test is terminated.



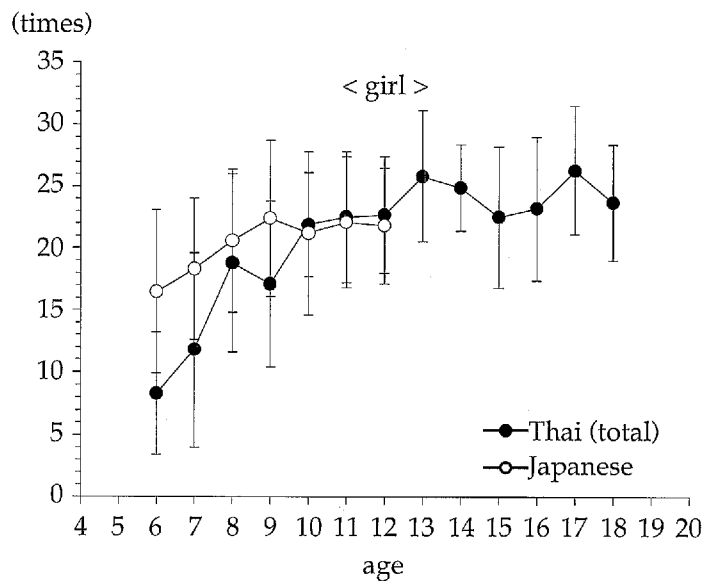
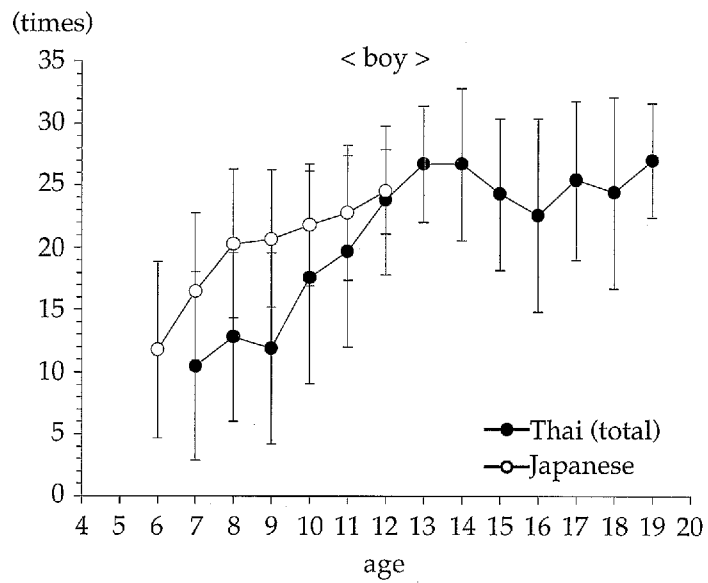


Fig 15 Rope skipping

Table 15 - 1

ROPE SKIPPING (times per 10-second)

BOY

AGE										AGE											
4	รร.อุบลวิทยาคม(๒๕๓๐)										Sashima, Japan(1987)										4
5	Ubon Whittayakom(1987)										Total										5
6	<u>n MEAN S.D.</u>										<u>n MEAN S.D.</u>										6
7	14	10.5	7.6								14	10.5	7.6	35	11.8	7.1	7				
8	27	12.8	6.8								27	12.8	6.8	43	20.3	6.0	8				
9	18	11.9	7.7	รร.พิบูลมังสาหาร(๒๕๓๐)							18	11.9	7.7	32	20.7	5.5	9				
10	24	17.6	8.5	Phibun Mangsahan(1987)							24	17.6	8.5	34	21.8	4.9	10				
11	19	19.7	7.7	<u>n MEAN S.D.</u>							19	19.7	7.7	40	22.8	5.4	11				
12	12	22.0	6.5	7	27.0	3.8					19	23.8	6.0	6	24.5	3.4	12				
13	2	17.0	7.1	21	27.6	3.4					23	26.7	4.7				13				
14				23	26.9	6.1					24	26.7	6.1				14				
15				18	24.3	6.1					18	24.3	6.1				15				
16				11	22.6	7.8					11	22.6	7.8				16				
17				18	25.4	6.4					18	25.4	6.4				17				
18				11	24.4	7.7					11	24.4	7.7				18				
19				3	27.0	4.6					3	27.0	4.6				19				
20																					20

Table 15 - 2

ROPE SKIPPING (times per 10-second)

GIRL

AGE													AGE
	รร.อุบลวิทยาคม(๒๕๓๐)												
4	Ubon Whittayakom(1987)						Total			Sashima, Japan(1987)			4
5	n	MEAN	S.D.				n	MEAN	S.D.	n	MEAN	S.D.	5
6	3	8.3	4.9				3	8.3	4.9	38	16.5	6.6	6
7	16	11.8	7.8				16	11.8	7.8	37	18.3	5.7	7
8	22	18.8	7.2	รร.พิบูลมังสาหาร(๒๕๓๐)			22	18.8	7.2	46	20.6	5.8	8
9	25	17.1	6.7	Phibun Mangsahan(1987)			25	17.1	6.7	47	22.4	6.3	9
10	17	21.9	4.2	n	MEAN	S.D.	17	21.9	4.2	50	21.2	6.6	10
11	21	22.6	5.5	4	22.0	4.8	25	22.5	5.3	38	22.1	5.3	11
12	12	20.1	5.8	14	24.9	1.6	26	22.7	4.7	6	21.8	4.7	12
13				20	25.9	5.4	21	25.8	5.3				13
14				20	24.9	3.5	20	24.9	3.5				14
15				20	22.5	5.7	20	22.5	5.7				15
16				22	23.2	5.8	22	23.2	5.8				16
17				27	26.3	5.2	27	26.3	5.2				17
18				10	23.7	4.7	10	23.7	4.7				18
19													19
20													20

16. Flying Disk Throwing

Purpose:

To measure the skill with which a person can pass a disk .

Equipment and Facilities:

Disk.

Field Markings:

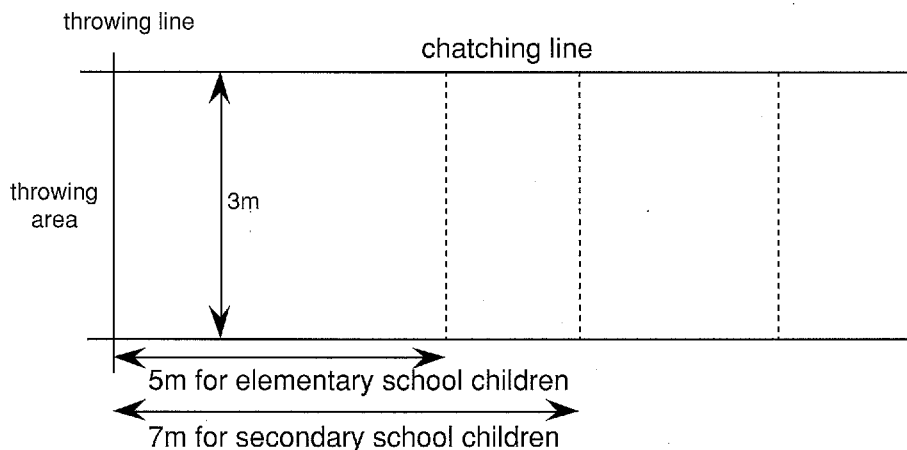
Markings require that the throwing line and the catching line in 3-meter lengths (see figure).

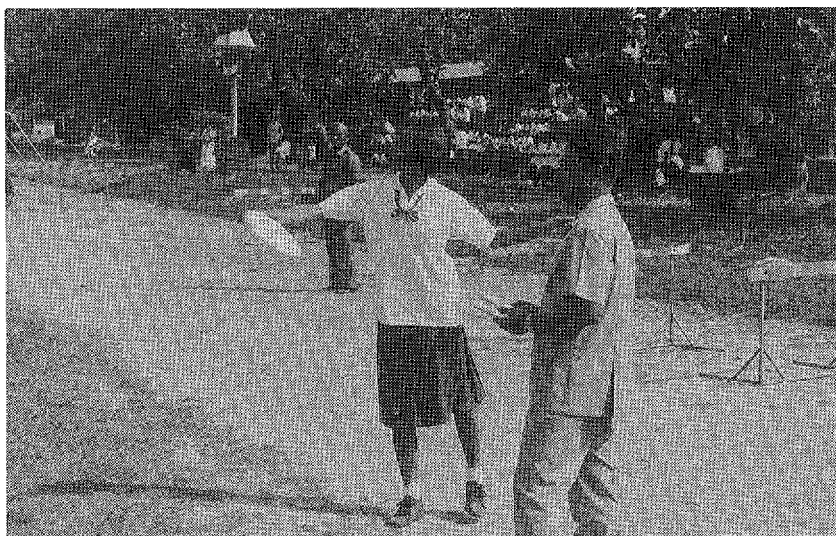
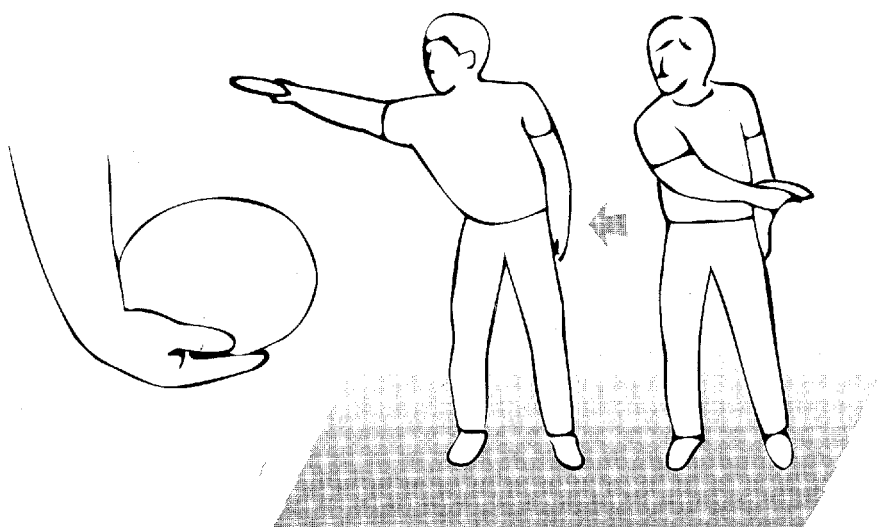
Procedure:

The examinee stands behind the catching line and a partner stands behind the throwing line with a disk in hand. The partner throws the disk horizontally forward from the opposite side of the hand holding the disk.

Scoring:

One point is scored if the examinee can catch the flying disk behind the line or touch the disk. If the student crosses over the line when a child catches or touches the disk, or catches or touches the disk outside the 3-meter wide area, or can't catch or touch the disk, the score is given a zero. The score consists of the compilation of five trials.





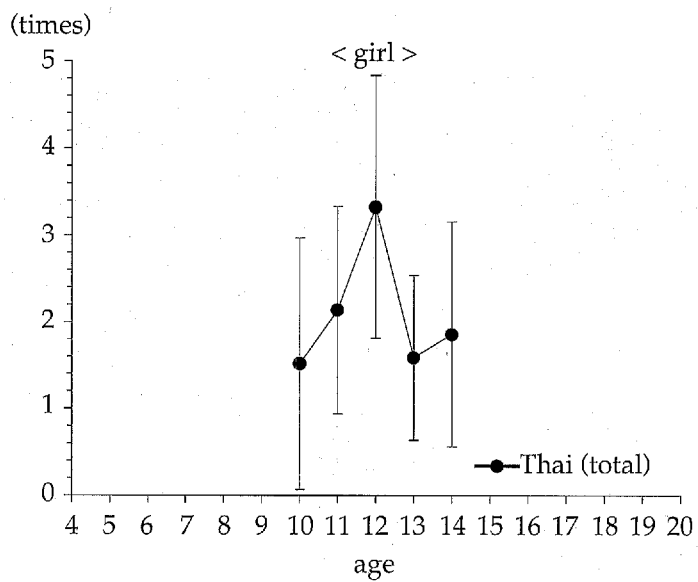
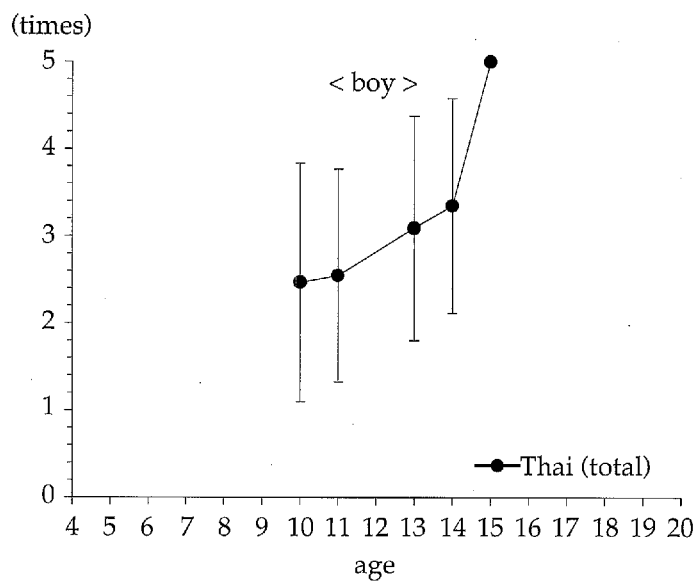


Fig 16 Flying disk throwing

Table 16 - 1

FLYING DISK THROWING (times of 5-trial)

BOY

AGE											AGE
4											4
5											5
6											6
7											7
8	รร.มอ.ทอง(๒๕๓๓)		รร.วิภาควิทยาการ(๒๕๓๓)				Total				8
9	Ban Mong Tong(1990)		Wiphak Witthayakon(1990)								9
10	<u>n MEAN S.D.</u>		<u>n MEAN S.D.</u>		<u>n MEAN S.D.</u>		<u>n MEAN S.D.</u>		<u>n MEAN S.D.</u>		10
11	41	2.63 1.07	รร.เดชอุดม(๒๕๓๓)	17	2.47 1.37	รร.พิบูลมังสาหาร(๒๕๓๓)	17	2.47 1.37			11
12			Dej Udom(1990)	23	2.39 1.47	Pibun Mangsaharn(1990)	64	2.55 1.22			12
13			<u>n MEAN S.D.</u>			<u>n MEAN S.D.</u>					13
14			4 2.25 1.26			30 3.20 1.27	34	3.09 1.29			14
15			33 3.52 1.03			7 2.57 1.81	40	3.35 1.23			15
16			2 5.00 0.00				2 5.00 0.00				16
17											17
18											18
19											19
20											20

Table 16 - 2

FLYING DISK THROWING (times of 5-trial)

GIRL

AGE											AGE
4											4
5											5
6											6
7											7
8											8
9											9
10											10
11											11
12											12
13											13
14											14
15											15
16											16
17											17
18											18
19											19
20											20

17. Vertical Jump with Run-up

Purpose:

This test measures explosive power of the extensor muscles of the legs and feet and the toe flexors which is related in sports scene.

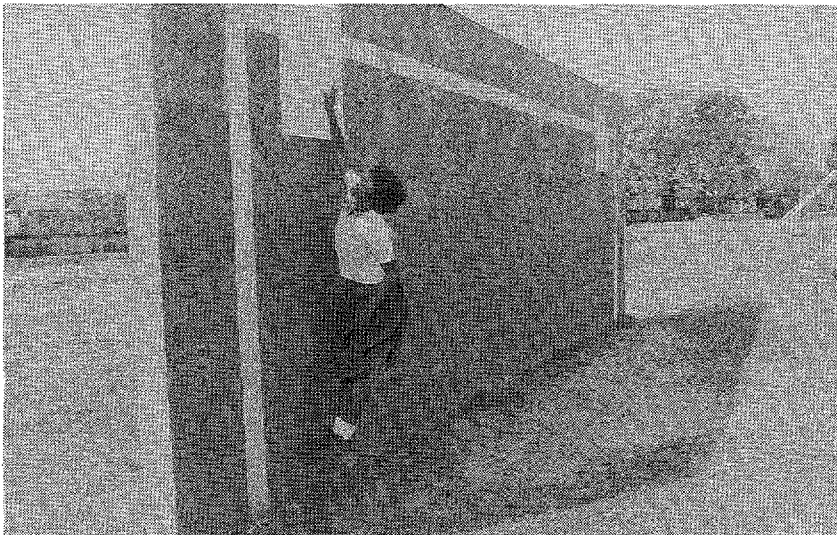
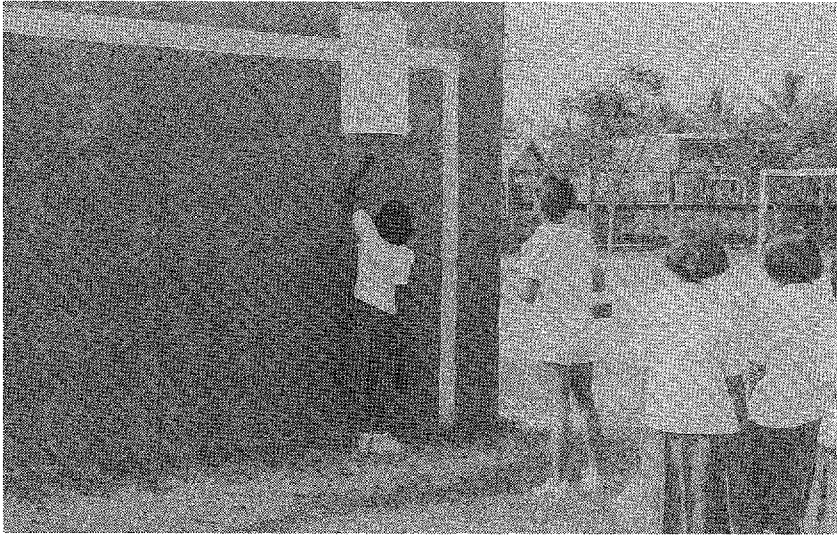
Procedure:

The student faces the wall with both feet flat on the floor, toes touching the wall. He then reaches as high as possible with either hand and makes a chalk mark on the wall. Before jumping, the student starts to run with his/her feet several centimeters apart from the desired jumping position, he/she jumps with both legs as high as possible from the desired jumping position, and at the peak of the jumping makes another chalk mark above the first one. After each test the chalk marks should be erased.

Scoring:

The measurement is the distance between the two marks. The examinee has two chances to take the test.





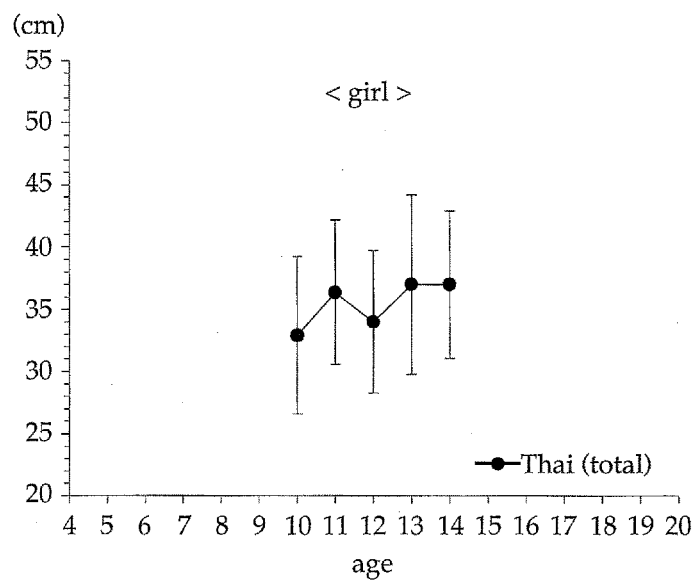
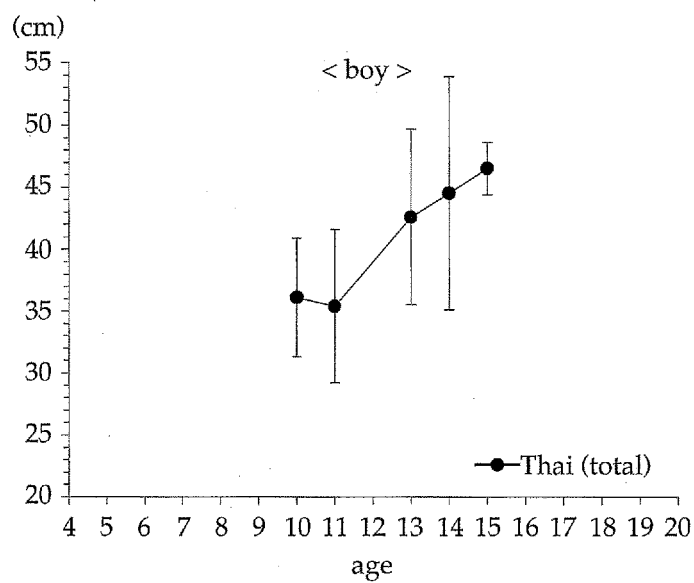


Fig 17 Vertical jump with run-up

Table 17 - 1

VERTICAL JUMP WITH RUN-UP (cm)

BOY

AGE											AGE			
4											4			
5											5			
6											6			
7	รร.วิภาควิทยาการ(๒๕๓๓)										7			
8	รร.บึงทอง(๒๕๓๓)		Wiphak Witthayakon(1990)				Total				8			
9	Ban Mong Tong(1990)		n MEAN S.D.				n MEAN S.D.				9			
10	n MEAN S.D.		รร.เดชอุดม(๒๕๓๓)		17	36.1	4.8	รร.พิบูลมังสาหาร(๒๕๓๓)		17	36.1	4.8	10	
11	41	34.2	5.5	Dej Udom(1990)		23	37.5	7.0	Pibun Mangsaharn(1990)		64	35.4	6.2	11
12			n MEAN S.D.				n MEAN S.D.						12	
13			4	43.8	7.4			30	42.4	7.2	34	42.6	7.1	13
14			33	45.6	8.9			7	39.1	10.6	40	44.5	9.4	14
15			2	46.5	2.1						2	46.5	2.1	15
16											16			
17											17			
18											18			
19											19			
20											20			

Table 17 - 2

VERTICAL JUMP WITH RUN-UP (cm)

GIRL

AGE											AGE
4											4
5											5
6											6
7											7
8											8
9											9
10											10
11											11
12											12
13											13
14											14
15											15
16											16
17											17
18											18
19											19
20											20

18. Leapfrog

Purpose:

To measure the skill with which an examinee can execute leapfrog.

Equipment and Facilities:

Stopwatch.

Field Markings:

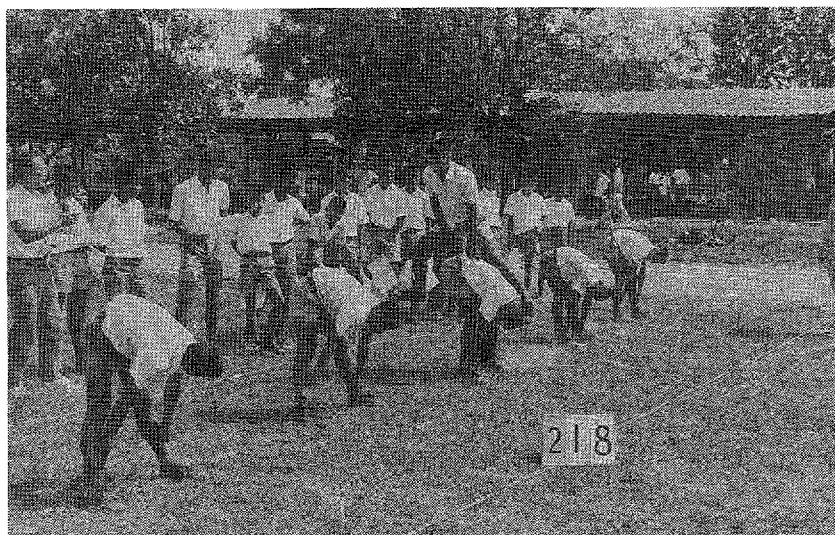
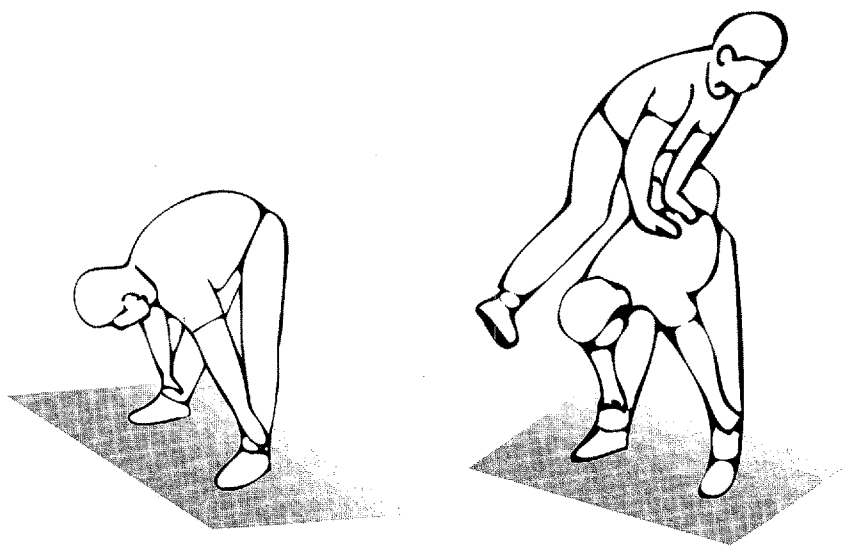
The tester marks 5 short lines for participants at 2 meter intervals from the starting line and draws a goal line at a 12 meter interval from the starting line.

Procedure:

The participants stand on the line at shoulder width in the middle. He/she horizontally bends himself/herself over. The examinee takes a position at the starting line with his/her toe at the edge of the line. On the signal "Go," the examinee runs as fast as possible and leaps like a frog over the participants.

Scoring:

The test administrator records the elapsed time from the signal "Go" until the examinee passes over the goal line. Time will be recorded in seconds taken up to the tenth of a second.



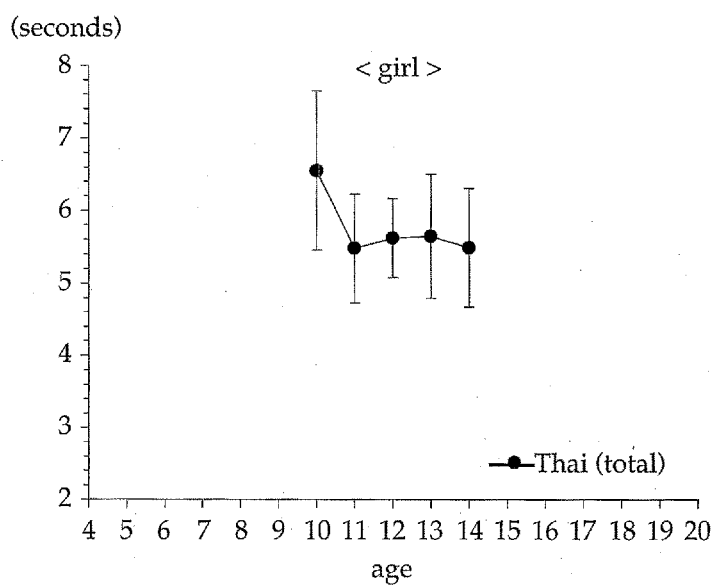
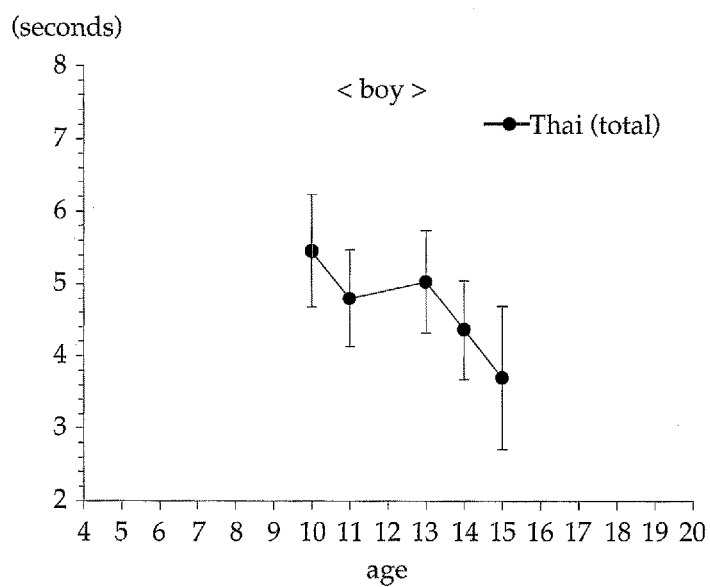


Fig 18 Leapfrog

Table18 - 1

LEAPFROG (second)

BOY

AGE											AGE
4											4
5											5
6											6
7											7
8											8
9											9
10											10
11											11
12											12
13											13
14											14
15											15
16											16
17											17
18											18
19											19
20											20

				รร.วิภาควิทยาการ(๒๕๓๓)							
				Wiphak Witthayakon(1990)				Total			
				n MEAN S.D.				n MEAN S.D.			
รร.บึงทอง(๒๕๓๓)				17	5.45	0.78		17	5.45	0.78	
Ban Mong Tong(1990)				23	5.11	0.62		64	4.80	0.67	
				รร.พิบูลมังสาหาร(๒๕๓๓)							
				Pibun Mangsaharn(1990)							
				n MEAN S.D.				n MEAN S.D.			
รร.เดชอุดม(๒๕๓๓)				29	5.12	0.66		33	5.03	0.71	
Dej Udom(1990)				7	5.17	0.41		40	4.36	0.68	
								2	3.70	0.99	

Table18 - 2

LEAPFROG (second)

GIRL

AGE											AGE
4											4
5											5
6											6
7	รร.วิภาควิทยาการ(๒๕๓๓)										7
8	รร.ม้งทอง(๒๕๓๓)	Wiphak Witthayakon(1990)						Total			8
9	Ban Mong Tong(1990)	<u>n MEAN S.D.</u>			รร.พิบูนมังสาหาร(๒๕๓๓)			<u>n MEAN S.D.</u>			9
10	<u>n MEAN S.D.</u>	26	6.56	1.12	Pibun Mangsaharn(1990)			27	6.55	1.10	10
11	40 5.34 0.72	10	6.05	0.61	<u>n MEAN S.D.</u>			50	5.48	0.75	11
12					5	5.62	0.61	6	5.62	0.54	12
13					24	5.60	0.83	25	5.65	0.85	13
14					12	5.49	0.82	12	5.49	0.82	14
15											15
16											16
17											17
18											18
19											19
20											20

ANNEX:
FREQUENCY TABLE OF MOTOR PATTERN
IN 18 LEADING FOLK GAMES AND SPORTS

Table 19 - 1

ONE HAND THROWING

BOY

AGE	รร.บ้านหนองเงิน้อย(๒๕๓๐)																				AGE
	Ban Nong Geonhoi(1988)								Total												
4	yes		no		รร.วิภาควิทยาการ(๒๕๓๐)								yes		no		4				
5	n	%	n	%	Wiphak Witthayakon(1988)								n	%	n	%	5				
6	0	0.0	4	100.0	yes		no								0	0.0	4	100.0	6		
7	0	0.0	24	100.0	n	%	n	%							0	0.0	24	100.0	7		
8	0	0.0	40	100.0	0	0.0	26	100.0	รร.พิบูลมังสาหาร(๒๕๓๐)				0	0.0	66	100.0	8				
9	0	0.0	2	100.0	14	35.0	26	65.0	Phibun Mangsahan(1988)				14	33.3	28	66.7	9				
10					27	67.5	13	32.5	yes		no		27	67.5	13	32.5	10				
11					14	43.8	18	56.3	n	%	n	%	14	43.8	18	56.3	11				
12					11	68.8	5	31.3	26	56.5	20	43.5	37	59.7	25	40.3	12				
13					2	100.0	0	0.0	46	67.6	22	32.4	48	68.6	22	31.4	13				
14									16	44.4	20	55.6	16	44.4	20	55.6	14				
15									16	61.5	10	38.5	16	61.5	10	38.5	15				
16									3	75.0	1	25.0	3	75.0	1	25.0	16				
17																	17				
18																	18				
19																	19				
20																	20				

Table 19 - 2

ONE HAND THROWING

GIRL

AGE													AGE
	ร.ร.บ้านหนองเงินชัย(๒๕๓๐)												
4	Ban Nong Geonhoi(1988)				ร.ร.วิภาควิทยาการ(๒๕๓๐)				Total				4
5	yes		no		Wiphak Witthayakon(1988)				yes		no		5
6	n	%	n	%	yes		no		n	%	n	%	6
7	0	0.0	34	100.0	n	%	n	%	ร.ร.พิบูลมังสาหาร(๒๕๓๐)				7
8	0	0.0	42	100.0	0	0.0	36	100.0	Phibun Mangsahan(1988)				8
9					0	0.0	32	100.0	yes		no		9
10					8	18.2	36	81.8	n	%	n	%	10
11					4	13.3	26	86.7	4	28.6	10	71.4	11
12					1	5.0	19	95.0	11	22.9	37	77.1	12
13									11	21.2	41	78.8	13
14									21	42.0	29	58.0	14
15									12	50.0	12	50.0	15
16									1	50.0	1	50.0	16
17													17
18													18
19													19
20													20

Table 20 - 1

TWO HANDED THROWING

BOY

AGE	ร.ร.บ้านหนองเงินฮ้อย(๒๕๓๐) Ban Nong Geonhoi(1988)								Total								AGE
4	yes				no				yes				no				4
5	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	5
6	0	0.0	4	100.0	0	0.0	24	100.0	0	0.0	4	100.0	0	0.0	24	100.0	6
7	0	0.0	24	100.0	0	0.0	40	100.0	0	0.0	24	100.0	0	0.0	40	100.0	7
8	0	0.0	40	100.0	1	3.8	25	96.2	1	1.5	65	98.5	1	1.5	65	98.5	8
9	0	0.0	2	100.0	14	35.0	26	65.0	14	33.3	28	66.7	14	33.3	28	66.7	9
10					30	75.0	10	25.0	30	75.0	10	25.0	30	75.0	10	25.0	10
11					20	62.5	12	37.5	20	62.5	12	37.5	20	62.5	12	37.5	11
12					10	62.5	6	37.5	25	54.3	21	45.7	35	56.5	27	43.5	12
13					2	100.0	0	0.0	38	55.9	30	44.1	40	57.1	30	42.9	13
14									16	44.4	20	55.6	16	44.4	20	55.6	14
15									13	50.0	13	50.0	13	50.0	13	50.0	15
16									3	75.0	1	25.0	3	75.0	1	25.0	16
17																	17
18																	18
19																	19
20																	20

Table 20 - 2

TWO HANDED THROWING

GIRL

AGE													AGE
	รร.บ้านหนองเงิน้อย(๒๕๓๐)				รร.วิภาควิทยากร(๒๕๓๐)				Total				
4	Ban Nong Geonhoi(1988)				Wiphak Witthayakon(1988)								4
5	yes		no		yes		no		yes		no		5
6	n	%	n	%	n	%	n	%	n	%	n	%	6
7	0	0.0	34	100.0	0	0.0	36	100.0	0	0.0	34	100.0	7
8	0	0.0	42	100.0	0	0.0	36	100.0	0	0.0	78	100.0	8
9					0	0.0	32	100.0	0	0.0	32	100.0	9
10					4	9.1	40	90.9	4	9.1	40	90.9	10
11					1	3.3	29	96.7	2	14.3	12	85.7	11
12					0	0.0	20	100.0	10	20.8	38	79.2	12
13									18	34.6	34	65.4	13
14									20	40.0	30	60.0	14
15									7	29.2	17	70.8	15
16									1	50.0	1	50.0	16
17													17
18													18
19													19
20													20

Table 21 - 1

OVER HAND THROWING

BOY

AGE	ร.บ้านหนองเงินฮ้อย(๒๕๓๐) Ban Nong Geonhoi(1988)								ร.วิภาควิทยากร(๒๕๓๐) Wiphak Witthayakon(1988)								ร.พิบูลมังสาหาร(๒๕๓๐) Phibun Mangsahan(1988)								AGE
	yes				no				yes				no				yes				no				
4	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	4
5	0	0.0	4	100.0	0	0.0	24	100.0	0	0.0	24	100.0	0	0.0	24	100.0	0	0.0	24	100.0	0	0.0	24	100.0	5
6	0	0.0	40	100.0	0	0.0	2	100.0	1	3.8	25	96.2	14	35.0	26	65.0	1	1.5	65	98.5	14	33.3	28	66.7	6
7	0	0.0	2	100.0	14	35.0	26	65.0	31	77.5	9	22.5	31	77.5	9	22.5	31	77.5	9	22.5	31	77.5	9	22.5	7
8	0	0.0	2	100.0	19	59.4	13	40.6	19	59.4	13	40.6	19	59.4	13	40.6	19	59.4	13	40.6	19	59.4	13	40.6	8
9	0	0.0	2	100.0	11	68.8	5	31.3	27	58.7	19	41.3	27	58.7	19	41.3	27	58.7	19	41.3	27	58.7	19	41.3	9
10	0	0.0	2	100.0	2	100.0	0	0.0	45	66.2	23	33.8	45	66.2	23	33.8	45	66.2	23	33.8	45	66.2	23	32.9	10
11	0	0.0	2	100.0	2	100.0	0	0.0	18	50.0	18	50.0	18	50.0	18	50.0	18	50.0	18	50.0	18	50.0	18	50.0	11
12	0	0.0	2	100.0	2	100.0	0	0.0	18	69.2	8	30.8	18	69.2	8	30.8	18	69.2	8	30.8	18	69.2	8	30.8	12
13	0	0.0	2	100.0	2	100.0	0	0.0	3	75.0	1	25.0	3	75.0	1	25.0	3	75.0	1	25.0	3	75.0	1	25.0	13
14	0	0.0	2	100.0	2	100.0	0	0.0	3	75.0	1	25.0	3	75.0	1	25.0	3	75.0	1	25.0	3	75.0	1	25.0	14
15	0	0.0	2	100.0	2	100.0	0	0.0	3	75.0	1	25.0	3	75.0	1	25.0	3	75.0	1	25.0	3	75.0	1	25.0	15
16	0	0.0	2	100.0	2	100.0	0	0.0	3	75.0	1	25.0	3	75.0	1	25.0	3	75.0	1	25.0	3	75.0	1	25.0	16
17	0	0.0	2	100.0	2	100.0	0	0.0	3	75.0	1	25.0	3	75.0	1	25.0	3	75.0	1	25.0	3	75.0	1	25.0	17
18	0	0.0	2	100.0	2	100.0	0	0.0	3	75.0	1	25.0	3	75.0	1	25.0	3	75.0	1	25.0	3	75.0	1	25.0	18
19	0	0.0	2	100.0	2	100.0	0	0.0	3	75.0	1	25.0	3	75.0	1	25.0	3	75.0	1	25.0	3	75.0	1	25.0	19
20	0	0.0	2	100.0	2	100.0	0	0.0	3	75.0	1	25.0	3	75.0	1	25.0	3	75.0	1	25.0	3	75.0	1	25.0	20

Table 21 - 2

OVER HAND THROWING

GIRL

AGE										AGE									
รร.บ้านหนองเงินฮ้อย(๒๕๓๐)																			
4	Ban Nong Geonhoi(1988)				รร.วิภาควิทยาการ(๒๕๓๐)				Total				4						
5	yes		no		Wiphak Witthayakon(1988)				yes		no		5						
6	n	%	n	%	yes		no		n		%		6						
7	0	0.0	34	100.0	n	%	n	%	รร.พิบูลมังสาหาร(๒๕๓๐)				7						
8	0	0.0	42	100.0	0	0.0	36	100.0	Phibun Mangsahan(1988)				8						
9					0	0.0	32	100.0	yes		no		9						
10					4	9.1	40	90.9	n	%	n	%	10						
11					2	6.7	28	93.3	2	14.3	12	85.7	11						
12					1	5.0	19	95.0	10	20.8	38	79.2	12						
13									18	34.6	34	65.4	13						
14									21	42.0	29	58.0	14						
15									6	25.0	18	75.0	15						
16									1	50.0	1	50.0	16						
17													17						
18													18						
19													19						
20													20						

Table 22 - 1

UNDER HAND THROWING

BOY

AGE	ร.ร.บ้านหนองเงินชัย(๒๕๓๐)												AGE
	Ban Nong Geonhoi(1988)								Total				
4	yes		no		ร.ร.วิภาควิทยาการ(๒๕๓๐)				yes		no		4
5	n	%	n	%	Wiphak Witthayakon(1988)				n	%	n	%	5
6	0	0.0	4	100.0	yes		no		0	0.0	4	100.0	6
7	0	0.0	24	100.0	n	%	n	%	0	0.0	24	100.0	7
8	0	0.0	40	100.0	0	0.0	26	100.0	ร.ร.พิบูลมังสาหาร(๒๕๓๐)				8
9	0	0.0	2	100.0	12	30.0	28	70.0	Phibun Mangsahan(1988)				9
10					18	45.0	22	55.0	yes		no		10
11					9	28.1	23	71.9	n	%	n	%	11
12					4	25.0	12	75.0	4	8.7	42	91.3	12
13					2	100.0	0	0.0	27	39.7	41	60.3	13
14									11	30.6	25	69.4	14
15									10	38.5	16	61.5	15
16									3	75.0	1	25.0	16
17													17
18													18
19													19
20													20

Table 22 - 2

UNDER HAND THROWING

GIRL

AGE										AGE									
รร.บ้านหนองเงิน้อย(๒๕๓๐)																			
4	Ban Nong Geonhoi(1988)				รร.วิภาควิทยาการ(๒๕๓๐)				Total										4
5	yes		no		Wiphak Witthayakon(1988)				yes		no						5		
6	n	%	n	%	yes		no						n	%	n	%	6		
7	0	0.0	34	100.0	n	%	n	%	รร.พิบูลมังสาหาร(๒๕๓๐)		0	0.0	34	100.0			7		
8	0	0.0	42	100.0	0	0.0	36	100.0	Phibun Mangsahan(1988)		0	0.0	78	100.0			8		
9					1	3.1	31	96.9	yes		no	1	3.1	31	96.9	9			
10					4	9.1	40	90.9	n	%	n	%	4	9.1	40	90.9	10		
11					2	6.7	28	93.3	2	14.3	12	85.7	4	9.1	40	90.9	11		
12					0	0.0	20	100.0	3	6.3	45	93.8	3	4.4	65	95.6	12		
13									9	17.3	43	82.7	9	17.3	43	82.7	13		
14									12	24.0	38	76.0	12	24.0	38	76.0	14		
15									5	20.8	19	79.2	5	20.8	19	79.2	15		
16									1	50.0	1	50.0	1	50.0	1	50.0	16		
17																	17		
18																	18		
19																	19		
20																	20		

Table 23 - 1

THROWING WITH RUNNING

BOY

AGE	รร.บ้านหนองเงิน้อย(๒๕๓๐)				รร.วิภาควิทยาการ(๒๕๓๐)				Total				AGE
	Ban Nong Geonhoi(1988)				Wiphak Witthayakon(1988)								
4	yes		no		yes		no		yes		no		4
5	n	%	n	%	n	%	n	%	n	%	n	%	5
6	0	0.0	4	100.0	0	0.0	26	100.0	0	0.0	4	100.0	6
7	0	0.0	24	100.0	0	0.0	26	100.0	0	0.0	24	100.0	7
8	0	0.0	40	100.0	0	0.0	26	100.0	0	0.0	66	100.0	8
9	0	0.0	2	100.0	10	25.0	30	75.0	10	23.8	32	76.2	9
10					15	37.5	25	62.5	15	37.5	25	62.5	10
11					2	6.3	30	93.8	2	6.3	30	93.8	11
12					3	18.8	13	81.3	10	21.7	36	78.3	12
13					0	0.0	2	100.0	28	41.2	40	58.8	13
14									10	27.8	26	72.2	14
15									9	34.6	17	65.4	15
16									2	50.0	2	50.0	16
17													17
18													18
19													19
20													20

Table 23 -2

THROWING WITH RUNNING

GIRL

AGE													AGE				
	รร.บ้านหนองเงินฮ้อย(๒๕๓๐)				รร.วิภาควิทยาการ(๒๕๓๐)				Total								
4	Ban Nong Geonhoi(1988)				Wiphak Witthayakon(1988)								4				
5	yes		no						yes		no		5				
6	n	%	n	%	yes	no						6					
7	0	0.0	34	100.0	n	%	n	%	รร.พิบูลมังสาหาร(๒๕๓๐)		0	0.0	34	100.0	7		
8	0	0.0	42	100.0	0	0.0	36	100.0	Phibun Mangsahan(1988)		0	0.0	78	100.0	8		
9					1	3.1	31	96.9	yes	no	1	3.1	31	96.9	9		
10					4	9.1	40	90.9	n	%	n	%	4	9.1	40	90.9	10
11					1	3.3	29	96.7	4	28.6	10	71.4	5	11.4	39	88.6	11
12					0	0.0	20	100.0	8	16.7	40	83.3	8	11.8	60	88.2	12
13									12	23.1	40	76.9	12	23.1	40	76.9	13
14									16	32.0	34	68.0	16	32.0	34	68.0	14
15									3	12.5	21	87.5	3	12.5	21	87.5	15
16									1	50.0	1	50.0	1	50.0	1	50.0	16
17																	17
18																	18
19																	19
20																	20

Table 24 - 1

THROWING WITH JUMPING

BOY

AGE	ร.ร.บ้านหนองเงินชัย(๒๕๓๐)				ร.ร.วิภาควิทยากร(๒๕๓๐)				ร.ร.พิบูลมังสาหาร(๒๕๓๐)				AGE
	Ban Nong Geonhoi(1988)				Wiphak Witthayakon(1988)				Phibun Mangsahan(1988)				
	yes		no		yes		no		yes		no		
	n	%	n	%	n	%	n	%	n	%	n	%	
4													4
5													5
6	0	0.0	4	100.0					0	0.0	4	100.0	6
7	0	0.0	24	100.0					0	0.0	24	100.0	7
8	0	0.0	40	100.0	0	0.0	26	100.0	1	1.5	65	98.5	8
9	0	0.0	2	100.0	10	25.0	30	75.0	10	23.8	32	76.2	9
10					15	37.5	25	62.5	6	15.0	34	85.0	10
11					2	6.3	30	93.8	2	6.3	30	93.8	11
12					3	18.8	13	81.3	10	21.7	36	78.3	12
13					0	0.0	2	100.0	28	41.2	40	58.8	13
14									10	27.8	26	72.2	14
15									9	34.6	17	65.4	15
16									2	50.0	2	50.0	16
17													17
18													18
19													19
20													20

Table 24 - 2

THROWING WITH JUMPING

GIRL

AGE													AGE
	ร.บ้านหนองเงินฮ้อย(๒๕๓๐)												
4	Ban Nong Geonhoi(1988)				ร.วิภาควิทยากร(๒๕๓๐)				Total				4
5	yes		no		Wiphak Witthayakon(1988)				yes		no		5
6	n	%	n	%	yes		no		n	%	n	%	6
7	0	0.0	34	100.0	n	%	n	%	ร.พิบูลมังสาหาร(๒๕๓๐)				7
8	0	0.0	42	100.0	0	0.0	36	100.0	Phibun Mangsahan(1988)				8
9					0	0.0	32	100.0	yes		no		9
10					6	13.6	38	86.4	n	%	n	%	10
11					0	0.0	30	100.0	2	14.3	12	85.7	11
12					0	0.0	20	100.0	6	12.5	42	87.5	12
13									12	23.1	40	76.9	13
14									14	28.0	36	72.0	14
15									2	8.3	22	91.7	15
16									1	50.0	1	50.0	16
17													17
18													18
19													19
20													20

Table 25 - 1

KICKING FORWARD WITH FOOT OR KNEE

BOY

AGE	รร.บ้านหนองเงิน้อย(๒๕๓๐)								Total								AGE
	Ban Nong Geonhoi(1988)				รร.วิภาควิทยาการ(๒๕๓๐)												
4	yes		no							yes		no		4			
5	n	%	n	%	Wiphak Witthayakon(1988)					n	%	n	%	5			
6	0	0.0	4	100.0	yes		no			0	0.0	4	100.0	6			
7	0	0.0	24	100.0	n	%	n	%		0	0.0	24	100.0	7			
8	0	0.0	40	100.0	0	0.0	26	100.0	รร.พิบูลมังสาหาร(๒๕๓๐)				0	0.0	66	100.0	8
9	0	0.0	2	100.0	14	35.0	26	65.0	Phibun Mangsahan(1988)				14	33.3	28	66.7	9
10					24	60.0	16	40.0	yes		no		24	60.0	16	40.0	10
11					21	65.6	11	34.4	n	%	n	%	21	65.6	11	34.4	11
12					11	68.8	5	31.3	31	67.4	15	32.6	42	67.7	20	32.3	12
13					2	100.0	0	0.0	51	75.0	17	25.0	53	75.7	17	24.3	13
14									28	77.8	8	22.2	28	77.8	8	22.2	14
15									20	76.9	6	23.1	20	76.9	6	23.1	15
16									4	100.0	0	0.0	4	100.0	0	0.0	16
17																	17
18																	18
19																	19
20																	20

Table 25 - 2

KICKING FORWARD WITH FOOT OR KNEE

GIRL

AGE									AGE
	ร.ร.บ้านหนองเงินฮ้อย(๒๕๓๐)				ร.ร.วิภาควิทยาการ(๒๕๓๐)				
4	Ban Nong Geonhoi(1988)				Wiphak Witthayakon(1988)				4
5	yes		no		yes		no		5
6	n	%	n	%	n	%	n	%	6
7	0	0.0	34	100.0	0	0.0	36	100.0	7
8	0	0.0	42	100.0	0	0.0	32	100.0	8
9					0	0.0	44	100.0	9
10					0	0.0	29	96.7	10
11					0	0.0	20	100.0	11
12									12
13									13
14									14
15									15
16									16
17									17
18									18
19									19
20									20

Table 26 - 1

KICKING BACKWARD WITH FOOT OR KNEE

BOY

AGE	ร.ร.บ้านหนองเงินฮ้อย(๒๕๓๐)				ร.ร.วิภาควิทยาการ(๒๕๓๐)				Total				AGE
	Ban Nong Geonhoi(1988)				Wiphak Witthayakon(1988)								
	yes		no		yes		no		yes		no		
	n	%	n	%	n	%	n	%	n	%	n	%	
4													4
5													5
6	0	0.0	4	100.0					0	0.0	4	100.0	6
7	0	0.0	24	100.0					0	0.0	24	100.0	7
8	0	0.0	40	100.0					0	0.0	66	100.0	8
9	0	0.0	2	100.0	13	32.5	27	67.5	13	31.0	29	69.0	9
10					17	42.5	23	57.5	17	42.5	23	57.5	10
11					16	50.0	16	50.0	16	50.0	16	50.0	11
12					7	43.8	9	56.3	19	41.3	27	58.7	12
13					2	100.0	0	0.0	34	50.0	34	50.0	13
14									25	69.4	11	30.6	14
15									17	65.4	9	34.6	15
16									4	100.0	0	0.0	16
17													17
18													18
19													19
20													20

Table 26 - 2

KICKING BACKWARD WITH FOOT OR KNEE

GIRL

AGE									AGE
	ร.ร.บ้านหนองเงินฮ้อย(๒๕๓๐)				ร.ร.วิภาควิทยาการ(๒๕๓๐)				
4	Ban Nong Geonhoi(1988)				Wiphak Witthayakon(1988)				4
5	yes		no		yes		no		5
6	n	%	n	%	n	%	n	%	6
7	0	0.0	34	100.0	0	0.0	36	100.0	7
8	0	0.0	42	100.0	0	0.0	32	100.0	8
9					0	0.0	44	100.0	9
10					0	0.0	30	100.0	10
11					0	0.0	20	100.0	11
12									12
13									13
14									14
15									15
16									16
17									17
18									18
19									19
20									20

Table 27 - 1

KICKING WITH RUNNING

BOY

AGE	รร.บ้านหนองเงิน้อย(๒๕๓๐)																				AGE
	Ban Nong Geonhoi(1988)				รร.วิภาควัทยาการ(๒๕๓๐)								Total								
4	yes		no		yes		no				yes		no		4						
5	n	%	n	%	Wiphak Witthayakon(1988)								n	%	n	%	5				
6	0	0.0	4	100.0	yes		no						0	0.0	4	100.0	6				
7	0	0.0	24	100.0	n	%	n	%					0	0.0	24	100.0	7				
8	0	0.0	40	100.0	0	0.0	26	100.0	รร.พิบูลมังสาหาร(๒๕๓๐)				0	0.0	66	100.0	8				
9	0	0.0	2	100.0	14	35.0	26	65.0	Phibun Mangsahan(1988)				14	33.3	28	66.7	9				
10					32	80.0	8	20.0	yes		no		32	80.0	8	20.0	10				
11					20	62.5	12	37.5	n	%	n	%	20	62.5	12	37.5	11				
12					11	68.8	5	31.3	29	63.0	17	37.0	40	64.5	22	35.5	12				
13					2	100.0	0	0.0	49	72.1	19	27.9	51	72.9	19	27.1	13				
14									21	58.3	15	41.7	21	58.3	15	41.7	14				
15									18	69.2	8	30.8	18	69.2	8	30.8	15				
16									4	100.0	0	0.0	4	100.0	0	0.0	16				
17																	17				
18																	18				
19																	19				
20																	20				

Table 27 - 2

KICKING WITH RUNNING

GIRL

AGE													AGE
	ร.บ้านหนองเงินฮ้อย(๒๕๓๐)				ร.วิภาควิทยาการ(๒๕๓๐)				Total				
4	Ban Nong Geonhoi(1988)				Wiphak Witthayakon(1988)								4
5	yes		no						yes		no		5
6	n	%	n	%	yes	no			n	%	n	%	6
7	0	0.0	34	100.0	n	%	n	%	0	0.0	34	100.0	7
8	0	0.0	42	100.0	0	0.0	36	100.0	0	0.0	78	100.0	8
9					0	0.0	32	100.0	0	0.0	32	100.0	9
10					1	2.3	43	97.7	n	%	n	%	10
11					1	3.3	29	96.7	0	0.0	14	100.0	11
12					0	0.0	20	100.0	1	2.1	47	97.9	12
13									4	7.7	48	92.3	13
14									3	6.0	47	94.0	14
15									0	0.0	24	100.0	15
16									0	0.0	2	100.0	16
17													17
18													18
19													19
20													20

Table 28 - 1

KICKING WITH JUMPING

BOY

AGE	ร.ร.บ้านหนองเงินฮ้อย(๒๕๓๐)				ร.ร.วิภาควิทยาการ(๒๕๓๐)				Total				AGE
	Ban Nong Geonhoi(1988)				Wiphak Witthayakon(1988)								
4	yes		no		yes		no		yes		no		4
5	n	%	n	%	n	%	n	%	n	%	n	%	5
6	0	0.0	4	100.0	0	0.0	26	100.0	0	0.0	4	100.0	6
7	0	0.0	24	100.0	0	0.0	26	100.0	0	0.0	24	100.0	7
8	0	0.0	40	100.0	0	0.0	26	100.0	0	0.0	66	100.0	8
9	0	0.0	2	100.0	13	32.5	27	67.5	13	31.0	29	69.0	9
10					29	72.5	11	27.5	29	72.5	11	27.5	10
11					20	62.5	12	37.5	20	62.5	12	37.5	11
12					10	62.5	6	37.5	25	54.3	21	45.7	12
13					2	100.0	0	0.0	43	63.2	25	36.8	13
14									22	61.1	14	38.9	14
15									18	69.2	8	30.8	15
16									3	75.0	1	25.0	16
17													17
18													18
19													19
20													20

Table 28 - 2

KICKING WITH JUMPING

GIRL

AGE									AGE
4	รร.บ้านหนองเงินย้อย(๒๕๓๐)				รร.วิภาควิทยาการ(๒๕๓๐)				4
5	yes		no		Wiphak Witthayakon(1988)		Total		5
6	n	%	n	%	yes	no	n	%	6
7	0	0.0	34	100.0	n	%	n	%	7
8	0	0.0	42	100.0	0	0.0	36	100.0	8
9					1	3.1	31	96.9	9
10					2	4.5	42	95.5	10
11					1	3.3	29	96.7	11
12					0	0.0	20	100.0	12
13									13
14									14
15									15
16									16
17									17
18									18
19									19
20									20

Table 29 - 1

CATCHING WITH ONE HAND

BOY

AGE	รร.บ้านหนองเงิน้อย(๒๕๓๐)												AGE
	Ban Nong Geonhoi(1988)								Total				
4	yes		no		รร.วิภาควิทยาการ(๒๕๓๐)				yes		no		4
5	n	%	n	%	Wiphak Witthayakon(1988)				n	%	n	%	5
6	0	0.0	4	100.0	yes		no		0	0.0	4	100.0	6
7	0	0.0	24	100.0	n	%	n	%	0	0.0	24	100.0	7
8	0	0.0	40	100.0	0	0.0	26	100.0	รร.พิบูลมังสาหาร(๒๕๓๐)				8
9	0	0.0	2	100.0	13	32.5	27	67.5	Phibun Mangsahan(1988)				9
10					29	72.5	11	27.5	yes		no		10
11					22	68.8	10	31.3	n	%	n	%	11
12					7	43.8	9	56.3	17	37.0	29	63.0	12
13					2	100.0	0	0.0	37	54.4	31	45.6	13
14									17	47.2	19	52.8	14
15									10	38.5	16	61.5	15
16									2	50.0	2	50.0	16
17													17
18													18
19													19
20													20

Table 29 - 2

CATCHING WITH ONE HAND

GIRL

AGE									AGE
4	รร.บ้านหนองเงินชัย(๒๕๓๐)				รร.วิภาควิทยาการ(๒๕๓๐)				4
5	yes		no		Wiphak Witthayakon(1988)		Total		5
6	n	%	n	%	yes	no	n	%	6
7	0	0.0	34	100.0	n	%	n	%	7
8	0	0.0	42	100.0	1	2.8	35	97.2	8
9					5	15.6	27	84.4	9
10					11	25.0	33	75.0	10
11					8	26.7	22	73.3	11
12					10	50.0	10	50.0	12
13									13
14									14
15									15
16									16
17									17
18									18
19									19
20									20

Table 30 - 1

CATCHING WITH BOTH HANDS

BOY

AGE	ร.บ้านหนองเงิน้อย(๒๕๓๐)												AGE
	Ban Nong Geonhoi(1988)								Total				
4	yes		no		ร.วิภาควิทยาการ(๒๕๓๐)				yes		no		4
5	n	%	n	%	Wiphak Witthayakon(1988)				n	%	n	%	5
6	0	0.0	4	100.0	yes		no		0	0.0	4	100.0	6
7	0	0.0	24	100.0	n	%	n	%	0	0.0	24	100.0	7
8	0	0.0	40	100.0	1	3.8	25	96.2	ร.พิบูลมังสาหาร(๒๕๓๐)				8
9	0	0.0	2	100.0	14	35.0	26	65.0	Phibun Mangsahan(1988)				9
10					30	75.0	10	25.0	yes		no		10
11					20	62.5	12	37.5	n	%	n	%	11
12					10	62.5	6	37.5	25	54.3	21	45.7	12
13					2	100.0	0	0.0	45	66.2	23	33.8	13
14									16	44.4	20	55.6	14
15									17	65.4	9	34.6	15
16									2	50.0	2	50.0	16
17													17
18													18
19													19
20													20

Table 30 - 2

CATCHING WITH BOTH HANDS

GIRL

AGE													AGE
	ร.ร.บ้านหนองเงินฮ้อย(๒๕๓๐)				ร.ร.วิภาควิทยาการ(๒๕๓๐)				Total				
4	Ban Nong Geonhoi(1988)				Wiphak Witthayakon(1988)								4
5	yes		no						yes		no		5
6	n	%	n	%	yes	no			n	%	n	%	6
7	0	0.0	34	100.0	n	%	n	%	0	0.0	34	100.0	7
8	0	0.0	42	100.0	0	0.0	36	100.0	0	0.0	78	100.0	8
9					3	9.4	29	90.6	3	9.4	29	90.6	9
10					8	18.2	36	81.8	8	18.2	36	81.8	10
11					4	13.3	26	86.7	2	14.3	12	85.7	11
12					1	5.0	19	95.0	10	20.8	38	79.2	12
13									20	38.5	32	61.5	13
14									25	50.0	25	50.0	14
15									16	66.7	8	33.3	15
16									2	100.0	0	0.0	16
17													17
18													18
19													19
20													20

Table 31 - 1

CATCHING WITH RUNNING

BOY

AGE	รร.บ้านหนองเงิน้อย(๒๕๓๐)																				AGE						
	Ban Nong Geonhoi(1988)								รร.วิภาควิทยาการ(๒๕๓๐)								Total										
4	yes		no										yes		no						4						
5	n	%	n	%					Wiphak Witthayakon(1988)				n		%		n		%		5						
6	0	0.0	4	100.0					yes		no		0		0.0		4		100.0		6						
7	0	0.0	24	100.0					n		%		0		0.0		24		100.0		7						
8	0	0.0	40	100.0					1		3.8		25		96.2		รร.พิบูลมังสาหาร(๒๕๓๐)		1		1.5		65		98.5		8
9	0	0.0	2	100.0					12		30.0		28		70.0		Phibun Mangsahan(1988)		12		28.6		30		71.4		9
10									31		77.5		9		22.5		yes		31		77.5		9		22.5		10
11									20		62.5		12		37.5		n		20		62.5		12		37.5		11
12									8		50.0		8		50.0		19		27		43.5		35		56.5		12
13									0		0.0		2		100.0		37		31		52.9		33		47.1		13
14																	17		19		47.2		19		52.8		14
15																	17		9		65.4		9		34.6		15
16																	2		2		50.0		2		50.0		16
17																											17
18																											18
19																											19
20																											20

Table 31 - 2

CATCHING WITH RUNNING

GIRL

AGE													AGE
4	ร.ร.บ้านหนองเงินชัย(๒๕๓๐)				ร.ร.วิภาควิทยาการ(๒๕๓๐)				Total				4
5	yes		no		Wiphak Witthayakon(1988)				yes		no		5
6	n	%	n	%	yes		no		n	%	n	%	6
7	0	0.0	34	100.0	n	%	n	%	0	0.0	34	100.0	7
8	0	0.0	42	100.0	1	2.8	35	97.2	1	1.3	77	98.7	8
9					7	21.9	25	78.1	7	21.9	25	78.1	9
10					10	22.7	34	77.3	10	22.7	34	77.3	10
11					13	43.3	17	56.7	2	14.3	12	85.7	11
12					9	45.0	11	55.0	15	31.3	33	68.8	12
13									20	38.5	32	61.5	13
14									30	60.0	20	40.0	14
15									16	66.7	8	33.3	15
16									2	100.0	0	0.0	16
17													17
18													18
19													19
20													20

Table 32 - 1

CATCHING WITH JUMPING

BOY

AGE	รร.บ้านหนองเงินชัย(๒๕๓๐) Ban Nong Geonhoi(1988)								Total								AGE
4	yes		no		รร.วิภาควิทยาการ(๒๕๓๐) Wiphak Witthayakon(1988)				yes		no						4
5	n	%	n	%					n	%	n	%					5
6	0	0.0	4	100.0	yes no				0	0.0	4	100.0					6
7	0	0.0	24	100.0	n % n %				0	0.0	24	100.0					7
8	0	0.0	40	100.0	1	3.8	25	96.2	รร.พิบูลมังสาหาร(๒๕๓๐) Phibun Mangsahan(1988)				1	1.5	65	98.5	8
9	0	0.0	2	100.0	14	35.0	26	65.0	yes no				14	33.3	28	66.7	9
10					26	65.0	14	35.0	n % n %				26	65.0	14	35.0	10
11					20	62.5	12	37.5	23	50.0	23	50.0	20	62.5	12	37.5	11
12					9	56.3	7	43.8	47	69.1	21	30.9	32	51.6	30	48.4	12
13					2	100.0	0	0.0	18	50.0	18	50.0	49	70.0	21	30.0	13
14									19	73.1	7	26.9	18	50.0	18	50.0	14
15									2	50.0	2	50.0	19	73.1	7	26.9	15
16													2	50.0	2	50.0	16
17																	17
18																	18
19																	19
20																	20

Table 32 - 2

CATCHING WITH JUMPING

GIRL

AGE													AGE
	รร.บ้านหนองเงิน้อย(๒๕๓๐)				รร.วิภาควิทยาการ(๒๕๓๐)				Total				
4	Ban Nong Geonhoi(1988)				Wiphak Witthayakon(1988)								4
5	yes		no		yes		no		yes		no		5
6	n	%	n	%	n	%	n	%	n	%	n	%	6
7	0	0.0	34	100.0	0	0.0	36	100.0	0	0.0	34	100.0	7
8	0	0.0	42	100.0	0	0.0	36	100.0	0	0.0	78	100.0	8
9					1	3.1	31	96.9	1	3.1	31	96.9	9
10					10	22.7	34	77.3	10	22.7	34	77.3	10
11					7	23.3	23	76.7	9	20.5	35	79.5	11
12					5	25.0	15	75.0	20	29.4	48	70.6	12
13									18	34.6	34	65.4	13
14									27	54.0	23	46.0	14
15									7	29.2	17	70.8	15
16									2	100.0	0	0.0	16
17													17
18													18
19													19
20													20

Table 33 - 1

HITTING WITH ONE HAND

BOY

AGE	ร.ร.บ้านหนองเงินฮ้อย(๒๕๓๐)								Total								AGE
	Ban Nong Geonhoi(1988)																
4	yes		no		ร.ร.วิภาควิทยากร(๒๕๓๐)				yes		no				4		
5	n	%	n	%	Wiphak Witthayakon(1988)				n	%	n	%			5		
6	0	0.0	4	100.0	yes		no		0	0.0	4	100.0			6		
7	0	0.0	24	100.0	n	%	n	%	0	0.0	24	100.0			7		
8	0	0.0	40	100.0	0	0.0	26	100.0	ร.ร.พิบูลมังสาหาร(๒๕๓๐)				0	0.0	66	100.0	8
9	0	0.0	2	100.0	6	15.0	34	85.0	yes		no		6	14.3	36	85.7	9
10					15	37.5	25	62.5	n	%	n	%	15	37.5	25	62.5	10
11					19	59.4	13	40.6	n	%	n	%	19	59.4	13	40.6	11
12					11	68.8	5	31.3	6	13.0	40	87.0	17	27.4	45	72.6	12
13					0	0.0	2	100.0	11	16.2	57	83.8	11	15.7	59	84.3	13
14									9	25.0	27	75.0	9	25.0	27	75.0	14
15									6	23.1	20	76.9	6	23.1	20	76.9	15
16									3	75.0	1	25.0	3	75.0	1	25.0	16
17																	17
18																	18
19																	19
20																	20

Table 33 - 2

HITTING WITH ONE HAND

GIRL

AGE													AGE
	ร.ร.บ้านหนองเงินฮ้อย(๒๕๓๐)												
4	Ban Nong Geonhoi(1988)				ร.ร.วิภาควิทยาการ(๒๕๓๐)				Total				4
5	yes		no		Wiphak Witthayakon(1988)				yes		no		5
6	n	%	n	%	yes		no		n	%	n	%	6
7	0	0.0	34	100.0	n	%	n	%	0	0.0	34	100.0	7
8	0	0.0	42	100.0	0	0.0	36	100.0	0	0.0	78	100.0	8
9					1	3.1	31	96.9	yes		no		9
10					8	18.2	36	81.8	n	%	n	%	10
11					9	30.0	21	70.0	1	7.1	13	92.9	11
12					4	20.0	16	80.0	12	25.0	36	75.0	12
13									18	34.6	34	65.4	13
14									21	42.0	29	58.0	14
15									18	75.0	6	25.0	15
16									1	50.0	1	50.0	16
17													17
18													18
19													19
20													20

Table 34 - 1

HITTING WITH AN EQUIPMENT

BOY

AGE	รร.บ้านหนองเงินชัย(๒๕๓๐)												AGE
	Ban Nong Geonhoi(1988)								Total				
4	yes		no		รร.วิภาควิทยาการ(๒๕๓๐)				yes		no		4
5	n	%	n	%	Wiphak Witthayakon(1988)				n	%	n	%	5
6	0	0.0	4	100.0	yes		no		0	0.0	4	100.0	6
7	0	0.0	24	100.0	n	%	n	%	0	0.0	24	100.0	7
8	0	0.0	40	100.0	0	0.0	26	100.0	รร.พิบูลมังสาหาร(๒๕๓๐)				8
9	0	0.0	2	100.0	0	0.0	40	100.0	Phibun Mangsahan(1988)				9
10					0	0.0	40	100.0	yes		no		10
11					7	21.9	25	78.1	n	%	n	%	11
12					1	6.3	15	93.8	9	19.6	37	80.4	12
13					0	0.0	2	100.0	3	4.4	65	95.6	13
14									3	8.3	33	91.7	14
15									2	7.7	24	92.3	15
16									0	0.0	4	100.0	16
17													17
18													18
19													19
20													20

Table 34 - 2

HITTING WITH AN EQUIPMENT

GIRL

AGE													AGE
	ร.ร.บ้านหนองเงินชัย(๒๕๓๐)				ร.ร.วิภาควิทยาการ(๒๕๓๐)				Total				
4	Ban Nong Geonhoi(1988)				Wiphak Witthayakon(1988)								4
5	yes		no						yes		no		5
6	n	%	n	%	yes	no			n	%	n	%	6
7	0	0.0	34	100.0	n	%	n	%	0	0.0	34	100.0	7
8	0	0.0	42	100.0	0	0.0	36	100.0	0	0.0	78	100.0	8
9					3	9.4	29	90.6	3	9.4	29	90.6	9
10					11	25.0	33	75.0	11	25.0	33	75.0	10
11					10	33.3	20	66.7	4	28.6	10	71.4	11
12					10	50.0	10	50.0	18	37.5	30	62.5	12
13									9	17.3	43	82.7	13
14									9	18.0	41	82.0	14
15									5	20.8	19	79.2	15
16									0	0.0	2	100.0	16
17													17
18													18
19													19
20													20

Table 35 - 1

HITTING A BALL

BOY

AGE	รร.บ้านหนองเงิน้อย(๒๕๓๐)										Total										AGE
	Ban Nong Geonhoi(1988)				รร.วิภาควัทยากร(๒๕๓๐)					yes				no							
4	yes		no							yes		no						4			
5	n	%	n	%	Wiphak Witthayakon(1988)					n	%	n	%					5			
6	0	0.0	4	100.0	yes		no			0	0.0	4	100.0					6			
7	0	0.0	24	100.0	n	%	n	%		0	0.0	24	100.0					7			
8	0	0.0	40	100.0	0	0.0	26	100.0	รร.พิบูลมังสาหาร(๒๕๓๐)				0	0.0	66	100.0	8				
9	0	0.0	2	100.0	0	0.0	40	100.0	Phibun Mangsahan(1988)				0	0.0	42	100.0	9				
10					0	0.0	40	100.0	yes		no		0	0.0	40	100.0	10				
11					1	3.1	31	96.9	n	%	n	%	1	3.1	31	96.9	11				
12					0	0.0	16	100.0	1	2.2	45	97.8	1	1.6	61	98.4	12				
13					0	0.0	2	100.0	4	5.9	64	94.1	4	5.7	66	94.3	13				
14									3	8.3	33	91.7	3	8.3	33	91.7	14				
15									3	11.5	23	88.5	3	11.5	23	88.5	15				
16									0	0.0	4	100.0	0	0.0	4	100.0	16				
17																	17				
18																	18				
19																	19				
20																	20				

Table 35 - 2

HITTING A BALL

GIRL

AGE													AGE
	รร.บ้านหนองเงิน้อย(๒๕๓๐)												
4	Ban Nong Geonhoi(1988)				รร.วิภาควิทยาการ(๒๕๓๐)				Total				4
5	yes		no		Wiphak Witthayakon(1988)				yes		no		5
6	n	%	n	%	yes		no		n	%	n	%	6
7	0	0.0	34	100.0	n	%	n	%	รร.พิบูลมังสาหาร(๒๕๓๐)				7
8	0	0.0	42	100.0	0	0.0	36	100.0	Phibun Mangsahan(1988)				8
9					0	0.0	32	100.0	yes		no		9
10					2	4.5	42	95.5	n	%	n	%	10
11					2	6.7	28	93.3	1	7.1	13	92.9	11
12					2	10.0	18	90.0	1	2.1	47	97.9	12
13									3	5.8	49	94.2	13
14									7	14.0	43	86.0	14
15									8	33.3	16	66.7	15
16									1	50.0	1	50.0	16
17													17
18													18
19													19
20													20

Table 36 - 1

HITTING A THROWING BALL

BOY

AGE	รร.บ้านหนองเงินฮ้อย(๒๕๓๐)												AGE
	Ban Nong Geonhoi(1988)								Total				
4	yes		no		รร.วิภาควิทยาการ(๒๕๓๐)				yes		no		4
5	n	%	n	%	Wiphak Witthayakon(1988)				n	%	n	%	5
6	0	0.0	4	100.0	yes		no		0	0.0	4	100.0	6
7	0	0.0	24	100.0	n	%	n	%	0	0.0	24	100.0	7
8	0	0.0	40	100.0	0	0.0	26	100.0	รร.พิบูลมังสาหาร(๒๕๓๐)				8
9	0	0.0	2	100.0	0	0.0	40	100.0	Phibun Mangsahan(1988)				9
10					10	25.0	30	75.0	yes		no		10
11					6	18.8	26	81.3	n	%	n	%	11
12					0	0.0	16	100.0	11	23.9	35	76.1	12
13					0	0.0	2	100.0	12	17.6	56	82.4	13
14									6	16.7	30	83.3	14
15									9	34.6	17	65.4	15
16									0	0.0	4	100.0	16
17													17
18													18
19													19
20													20

Table 36 - 2

HITTING A THROWING BALL

GIRL

AGE									AGE
4	ร.ร.บ้านหนองเงินชัย(๒๕๓๐) Ban Nong Geonhoi(1988)				ร.ร.วิภาควิทยากร(๒๕๓๐) Wiphak Witthayakon(1988)				4
5	yes		no		yes		no		5
6	n	%	n	%	n	%	n	%	6
7	0	0.0	34	100.0	0	0.0	36	100.0	7
8	0	0.0	42	100.0	0	0.0	32	100.0	8
9					0	0.0	40	90.9	9
10					4	9.1	24	80.0	10
11					6	20.0	17	85.0	11
12					3	15.0	17	85.0	12
13									13
14									14
15									15
16									16
17									17
18									18
19									19
20									20

References

- Barrow H. M., MacGree, R. and Tritshler, K. A. (1989) Practical Measurement in Physical Education and Sport (forth edition), Lea & Febiger, Philadelphia
- Dept. of Physical Education (1982) Thailand Analytical Results of Height and Weight of Thai-people, 10-16 (in Thai)
- Japan Junior Sports Clubs Association (1990) Operation manual for motor fitness test (JJSA test)
- Jensen, C. R. AND Hirst, C. C. (1980) Measurment in Physical Education and Athletics, Macmillan Publishing, New York
- Ohsawa, S., Tanaka, H., Sagawa, T. and Suthi, P. (1989) Statistics of Ubon Child Development Study. Bull. Otsuma Wom. Univ., Home Econ., 27:123-137
- Ohsawa, S. and Sagawa, T. (ed.) (1992) Ubon child Growth Study, Fuji Technology Press, Tokyo
- Physical Fitness Laboratory, Tokyo Metropolitan University (1980) Physical Fitness Standards of Japanese People (third edition), Fumaide, Tokyo
- Sagawa, T. and Ohsawa, S. (1991) Disappearance of traditional children's play and games and modification of sports in northeast Thailand, J. J. of Physical Education, 36:209-218 (in Japanese)
- Society of Health Statistics in Southeast Asia (1991) Ubon Child Development Study, Fuji Technology Press, Tokyo

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