

Comparative Study of Physical Fitness of the Youth in Asia and Their Attitude Toward Sports 亞洲青少年體適能及對運動態度的比較研究

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摘要

亞洲區國際健康、體育及康樂協會建議的全亞洲青少年體適能測試已於一九八九年成功推行。除了上述的測試外，本章探討青少年對運動的態度，並從多個角度來作分析和評論，比較對象包括來自日本、中國、澳門和香港的青少年，盼望能鼓勵學童多關注身體健康。

Intorduction and Procedures

The Asian Health Related Youth Fitness Test was first proposed by the Asia Regional Board of International Council for Health, Physical Education and Recreation (ICHPER) in 1989. The test battery consists of endurance run (800 meters for children of ages 10 and 11 years, 1,000 meters for girls of ages 12 through 17 years, and 1,500 meters for boys of 12 through 17 years), sit-ups in 60 seconds, pull-ups (modified pull-ups for girls of all ages and boys of ages 10 and 11 years), sit-and-reach test of flexibility at sitting position, and skinfolds (sum of triceps and calf). Together with the fitness

test, it was planned that a questionnaire survey on the cultural background of such youth fitness, such as the attitude of the youths towards sports and physical activities was also to be conducted to the same subject group. In this questionnaire, sports and physical activity behavior, feelings about sports and physical activities, such as if one thinks it is effective for health, relaxation, strength training or friendship promotion and if it is thought to be harmful, boring or unnecessary, were studied.

In 1991, the Japanese survey was conducted as an official project under the name of "Asia Youth Fitness Japan", of Test and Measurement Research Division, Japanese Society of Physical

Education. The testing involved 2,149 boys and girls of respective age groups, attending elementary, junior high and senior high schools in urban areas. In 1992, the Chinese survey was conducted using 3,168 Chinese students attending public schools in Shanghai area, under the leadership of Dr. Zou Da Hua of Shanghai Research Institute of Sports Sciences. The data analysis was proceeded by Mr. Lu Da Jiang, a graduate student in physical education then, at Tokyo Gakugei University Computer Center, Koganei City, Tokyo. The results of Japan and China studies were included in the report publication of Test and Measurement Research Division of Japanese Society of Physical Education in 1993. The summary report of these projects were also introduced in the ICHPER.SD (ICHPER grew into International Council for Health, Physical Education, Recreation, Sports and Dance in 1993) Journal 1994 fall issue.

The Hong Kong group study project also took place in 1990-91 years, under the leadership of Dr. Frank Fu, with the assistance of the Hong Kong Education Department and the cooperation of the school principals and teachers, using 20,304 school children and the full report was published by Department of Physical Education, Hong Kong Baptist College in 1994.

The Macau group study project was made in 1994-95 years, using 1,547 boy and girl subjects of same age levels like other studies, which was conducted under the supervision of Dr. Chen Ji Zhi of Shanghai Institute of Physical Education. The project was made possible because of the negotiation between Dr. Shi De Wei, Principal of School of Physical Education, Macau Polytechnic Institute and Dr. Chen, as Dr. Shi visited Shanghai in 1990. The testing took place in fall of 1994 and its results were included in the report publication made by the Macau Polytechnic Institute in December, 1995.

The primary purpose of developing this test battery, as the ICHPER-Asia Board indicated, was not to compare or encourage competition among the subjects of various nations (regional groups), but rather to encourage respective school children to become more health and fitness conscious. In one hand, by proceeding each project, the primary purpose has perhaps been well accomplished. Then the current study intends to make a brief overview about the results of four test projects, making a series of simple comparison of fitness levels and differences and similarities of sports culture in these groups.

In proceeding the current comparative analysis which was mainly conducted by Hatano and Lu in Tokyo, the Hong Kong group sports culture study portion had to be deleted, because the detailed report of this section was unavailable. Otherwise, the data of each group, as appeared in each report publication, were used for comparative procedure. Tables and figures were provided.

Results

Number of subjects, mean and standard deviation and results of all the test and measurement parameters for each age level of four different regional subject groups, together with t-test results for difference between means are presented in Tables 1 (females) and 2 (males). In endurance run test for girls, a discrepancy in the running distance among the regional groups did happen. Therefore, t-test for difference between means was omitted when necessary. In certain other cases, the number of subjects for particular test item for respective age/sex group was not large enough for statistical treatment.

The inter-regional group comparison of test and measurement results along the age development changes are demonstrated in Figures 1 - 5 (female) and Figures 6-10 (males). Then the results of inter-regional comparison (except Hong Kong group) of cultural aspects of physical education/sports participation (Figures 11-16 for selected age groups and Figures 17-46 for different school levels) are demonstrated in Figures 11-46. In Figures 11-16, rating scale 1 represents "strongly disagree," and rating scale 5 represents "strongly agree."

Discussions

In general, the China group exceeded the other three groups and the Macau group underscored of all the groups in almost all the fitness parameters, suggesting certain significant tendencies in this aspect. In terms of Japan-Hong Kong comparison, Japan group seems to be better scored in endurance run and sit-and-reach tests than the Hong Kong group. Then the Hong Kong group outscored Japan (and China, in some age levels) in pull-up test. In the skinfold thickness measurement, Japan and China groups seemed to be in the same level and recorded larger amount than the other two, while the Macau group stayed at the thinnest level in all age levels.

It is difficult to draw any conclusive statement about the cultural differences that may influence the health-related fitness results of the youth. However, a speculative supposition may be made that the China group is strongly physical conscious, at least among the four inter-regional groups that are compared in this study, and the Macau group stayed behind of other groups, perhaps resulting from less emphasis in health and fitness consciousness in school education and education of youth in the society in general.

Regarding the significance of exercise and sports, rather negative evaluation was indicated by the China group, as the response tended to suggest such physical activities are thought to be uncomfortable, too difficult and boring. Japan group

takes physical activities as of training nature. Macau group indicated that physical activities gives relaxation. In other words, in China exercise and sports are regarded as a compulsive hardship (while their fitness level is regarded to be of the highest of all the groups), in Japan it is considered to be a sort of training, and in Macau it is taken as more of relaxation activities (while their fitness level is not comparable to the other groups). On the other hand, physical activities are always evaluated in all the subject groups to be enjoyable and useful for promotion of relaxation, health and fitness.

In terms of the time length (hours per week) to be spent for sports activities, Japan group recorded the longest, then China and Macau in this order. In the case of Japan, the reaction was rather versatile as there were both longest (13 + hrs/ wk) and rather short 9 2-4 hrs/wk) time groups, while China group concentrated to 2-4 and 5-8 hrs/wk brackets, and Macau, 0-2 and 2-4. All three groups indicated that the schools provide the greatest portion (80-90%) of the sports facility in the society.

The Chinese boy group indicated their frequent participation in soccer, track and field athletics and basketball, and the girl group, in track and field, gymnastics and basketball in this order. The Japanese boy group, baseball, soccer and tennis, then girl group, tennis, basketball and volleyball. The Macau boy group, basketball, soccer and track and field athletics, then girl group, track and field athletics, badminton and basketball.

Summary

Total of 27,168 school children of ages 10 through 17 years in four different nations/regions in (east) Asia were tested in ICHPER.SD Health-related Fitness Test, and its cultural background was examined by use of a 20-item questionnaire survey. The results may be summarized as follows:

- 1) China group constantly recorded the highest fitness level of all the four regional groups, and Macau constantly the least. Japan and Hong Kong group were ranked about the same each other, though Hong Kong performed rather well in the pull-up test and Japan in endurance run. In terms of the skinfold thickness, Japan and China groups recorded the highest (thickest) values.
- 2) As for the significance of physical activities, all three groups consistently felt that such activities are enjoyable, useful for health and fitness promotion and relaxing. The

China group then indicated that such activities are rather compulsively given and boring. The Japan group felt it to be a sort of training, and the Macau group, of relaxation.

- 3) In terms of the weekly time length spent for physical activities, the Japan group demonstrated a diversity tendency with the longest mean value, then China and Macau the least amount.
- 4) For sports activities in general, in all three regions the most frequently used facility is exclusively provided in schools, suggesting other facilities are yet to be developed.
- 5) The frequently participated sports activities were found to be the followings. For China group, soccer, track and field athletics and basketball for boys, and track and field, gymnastics and basketball for girls. For Japan group, baseball, soccer and tennis for boys, and tennis, track and field athletics and volleyball for girls. Then for Macau group, basketball, soccer and track and field athletics for boys, and track and field athletics, badminton and basketball for girls.

References

- Fu, Frank (1994). *Health fitness parameters of Hong Kong school children*. Hong Kong Baptist College.
- Fu, Frank (1994). ICHPER. SD Asia Youth Health Related Fitness Test : Implementation in Hong Kong. *ICHPER.SD Journal* 30(3):22-27.
- Hatano, Yoshiro (1993). *Asia Youth Health-related Fitness Test study project report*. Asia Youth Fitness Japan, Test and Measurement Research Division, Japanese Society of Physical Education.
- Hatano, Yoshiro (1994). ICHPER.SD Asia Youth Health Related Fitness Test: Construction of norms for Japanese students. *ICHPER.SD Journal* 30(3):8-15.
- Shi De Wei (1995). *General report of Macau youth fitness test*. Macau college of Physical Education Youth Fitness Testing Team.
- Zou DA Hua (1994). ICHPER.SD Asia Youth Health Related Fitness Test : Test results of Chinese students. *ICHPER.SD Journal* 30(3):16-21.

Table.1 Over-all comparison of results from four regional groups (female)

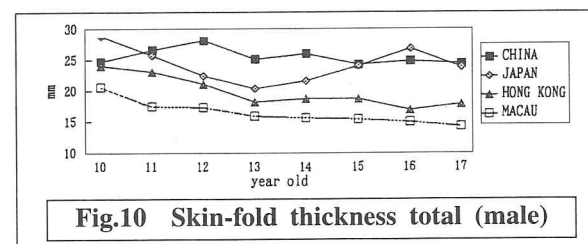
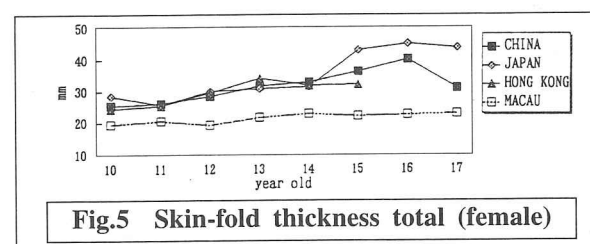
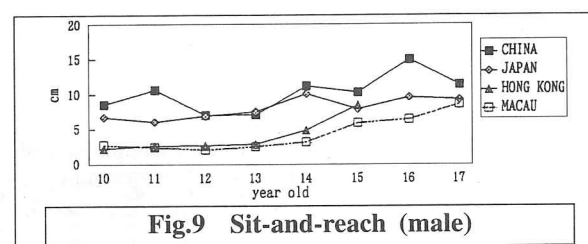
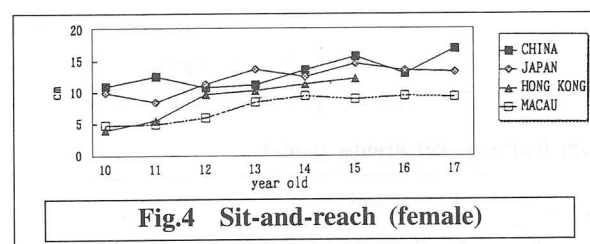
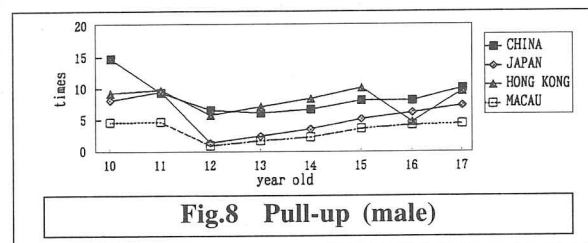
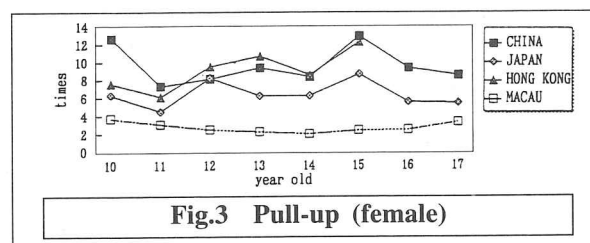
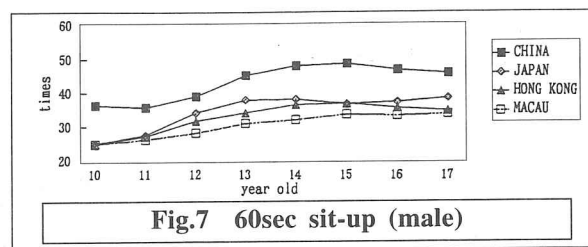
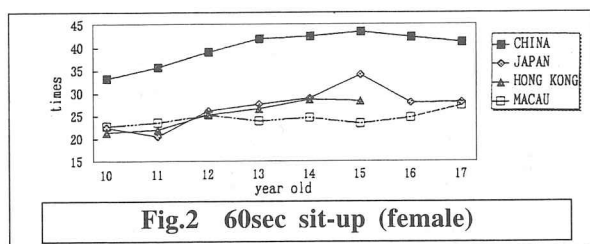
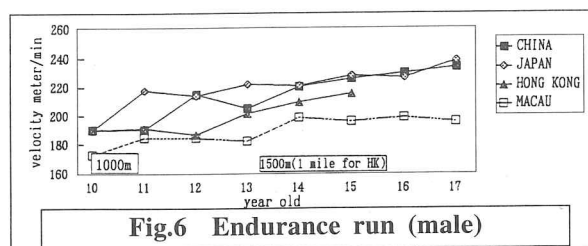
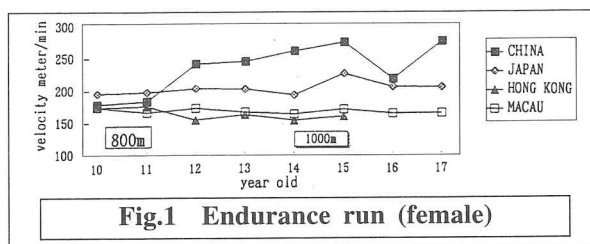
ITEM	AGE	1 CHINA (female)		2 JAPAN (female)		3 HONG KONG (female)		4 MACAU (female)		t-test(1-2)	t-test(1-3)	t-test(2-3)	t-test(1-4)	t-test(2-4)	t-test(3-4)
		N	MEAN	SD	N	MEAN	SD	N	MEAN						
endurance run (second)	10	209	267.6	34.8	66	245.3	31.1	559	276.1	59.0	68	276.1	34.7	4.94 **	--
	11	205	261.4	32.0	66	242.1	19.2	607	272.0	65.0	70	288.3	39.1	5.93 **	--
	12	205	249.2	26.7	113	295.5	26.6	883	389.3	59.3	47	347.6	55.0	-14.84 **	--
	13	204	245.6	29.3	112	297.0	25.9	882	369.5	69.4	84	361.3	50.7	-16.09 **	--
	14	205	229.8	22.6	101	311.7	38.0	872	391.5	47.4	71	369.1	55.8	-19.98 **	--
	15	203	218.1	15.2	119	265.3	27.4	883	377.7	59.7	61	351.6	45.7	-17.30 **	--
	16	185	275.9	63.2	126	292.0	31.3	--	--	--	74	365.4	63.3	-2.98 **	--
	17	203	218.3	14.2	132	293.6	35.1	279	377.7	56.0	59	365.8	54.7	-23.44 **	--
60sec sit-up (times)	10	209	33.3	8.9	101	22.5	8.3	603	21.4	8.2	86	22.8	8.1	10.54 **	17.13 **
	11	205	35.7	8.4	122	20.4	6.6	639	21.8	8.1	75	23.5	8.7	18.30 **	20.81 **
	12	205	39.0	7.3	117	26.0	7.5	894	25.1	7.2	60	25.1	8.9	15.05 **	24.49 **
	13	204	41.8	9.1	115	27.4	7.3	938	26.4	8.3	95	23.7	9.0	15.49 **	22.38 **
	14	205	42.3	5.9	105	28.7	7.8	894	28.4	7.4	77	24.4	7.6	15.65 **	28.76 **
	15	203	43.3	5.7	131	33.8	9.2	932	28.1	7.9	75	23.1	9.3	10.57 **	31.73 **
	16	204	42.1	5.9	134	27.7	8.6	--	--	--	88	24.4	8.3	16.96 **	--
	17	203	41.0	4.2	136	27.8	8.5	285	27.6	7.4	65	27.1	6.9	16.85 **	25.45 **
pull-ups (times)	10	209	12.7	5.5	101	6.3	5.2	600	7.6	7.5	86	3.7	3.4	9.90 **	10.34 **
	11	205	7.3	4.5	123	4.5	4.3	635	6.1	5.5	74	3.1	3.4	5.71 **	3.20 **
	12	195	8.1	6.6	117	8.2	6.4	579	9.5	8.8	61	2.5	2.4	-0.09	-2.24 *
	13	193	9.3	9.2	120	6.2	5.1	664	10.6	9.5	95	2.2	2.4	3.88 **	-1.72
	14	205	8.3	7.7	109	6.2	5.3	646	8.5	7.7	77	2.0	2.6	2.87 **	-0.32
	15	193	12.8	7.3	130	8.6	5.5	544	12.2	11.3	75	2.4	2.5	5.92 **	0.89
	16	204	9.3	6.9	132	5.5	4.9	--	--	--	88	2.4	2.5	5.93 **	--
	17	203	8.5	7.6	137	5.4	4.1	238	12.7	11.6	65	3.3	2.5	4.84 **	-4.56 **
sit and reach (cm)	10	209	11.0	6.0	101	9.9	5.5	513	4.0	7.0	86	4.8	4.6	1.53	13.47 **
	11	205	12.5	6.2	122	8.4	7.2	535	5.5	6.2	75	4.9	6.3	5.24 **	13.75 **
	12	205	10.7	4.5	117	11.3	6.4	859	9.6	6.5	60	6.0	7.1	-0.85	2.94 **
	13	204	11.2	4.8	118	13.6	6.3	900	10.2	6.9	95	8.4	8.0	-3.62 **	2.42 *
	14	205	13.5	4.6	108	12.4	7.8	861	11.2	6.5	77	9.4	6.4	1.30	5.78 **
	15	203	15.6	4.8	132	14.5	6.9	920	12.1	6.7	75	8.8	8.4	1.66	8.79 **
	16	204	12.9	6.1	133	13.4	6.6	--	--	--	88	9.3	7.1	-0.73	--
	17	203	16.8	6.4	134	13.2	7.5	287	12.8	6.4	65	9.2	6.7	4.60 **	6.87 **
skin-fold thickness total (mm)	10	209	25.5	8.6	100	28.5	9.5	543	24.5	--	86	19.6	7.0	-2.71 **	1.65
	11	205	26.3	7.3	123	25.8	7.3	560	25.5	--	75	20.8	6.3	0.58	1.49
	12	205	28.6	8.6	118	30.1	7.3	876	29.7	--	60	19.5	4.8	-1.69	-1.87
	13	204	31.8	8.0	120	31.0	6.8	937	34.3	--	95	22.2	5.4	1.05	-4.47 **
	14	205	33.0	8.1	109	31.6	8.2	888	31.9	--	77	23.1	6.1	1.48	1.91
	15	203	36.4	8.4	133	43.2	10.0	936	32.2	--	75	22.4	3.8	-6.46 **	7.13 **
	16	203	40.2	8.5	135	45.2	8.5	--	--	--	88	22.8	4.5	-5.23 **	--
	17	203	31.1	6.9	136	43.8	7.8	292	33.9	--	65	23.0	3.8	-15.44 **	-5.77 **

* p < 0.05 ** p < 0.01

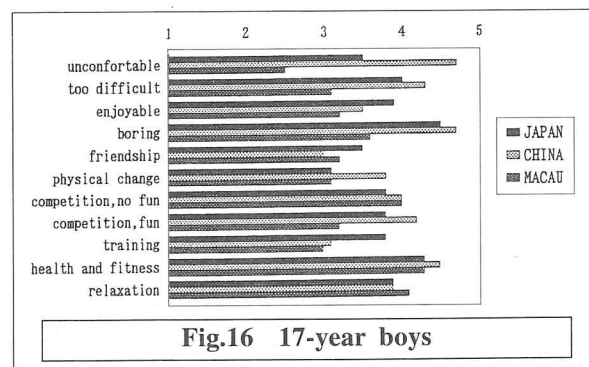
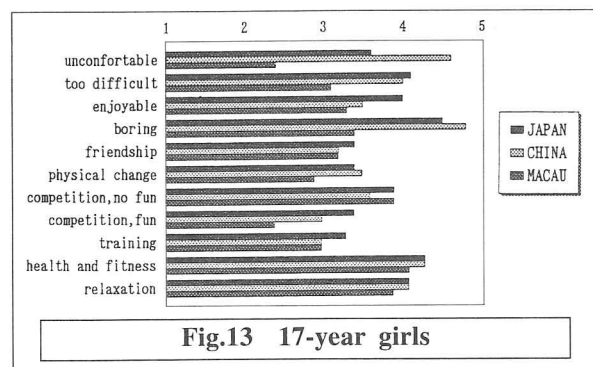
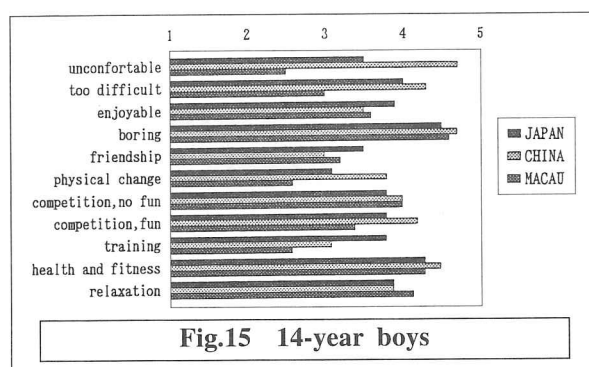
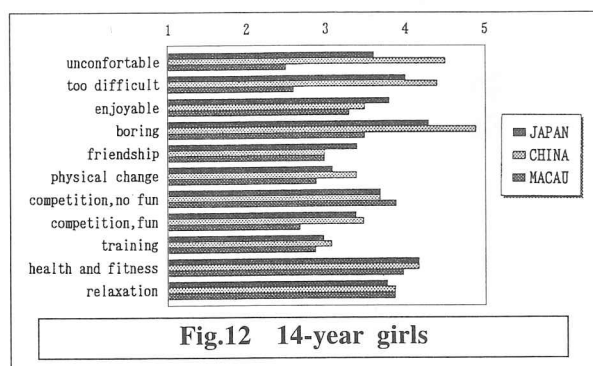
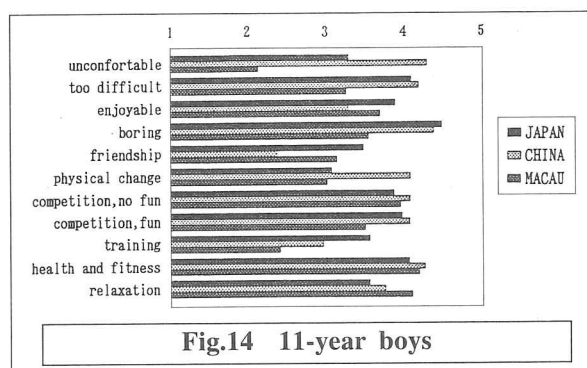
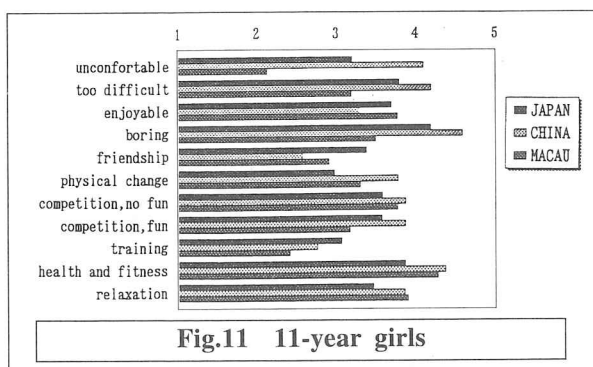
Table.2 Over-all comparison of results from four regional groups (male)

ITEM	AGE	1 CHINA (male)		2 JAPAN (male)		3 HONG KONG (male)		4 MACAU (male)		t-test(1-2)	t-test(1-3)	t-test(2-3)	t-test(1-4)	t-test(2-4)	t-test(3-4)
		N	MEAN	SD	N	MEAN	SD	N	MEAN						
endurance run (second)	10	203	252.1	33.2	56	252.8	50.6	619	252.3	59.6	81	277.7	50.0	-0.10	-0.06
	11	203	252.0	44.0	71	220.2	30.2	724	250.5	64.4	73	259.4	38.4	6.71 **	0.37
	12	51	418.0	8.4	115	420.1	54.2	1832	480.9	88.9	47	486.6	77.0	-0.40	-26.37 **
	13	189	437.9	43.9	111	405.2	38.3	1804	445.7	78.9	66	492.2	72.0	6.75 **	-2.12 *
	14	206	408.0	39.9	112	406.8	49.0	1619	428.9	69.3	89	452.2	70.9	0.22	-6.40 **
	15	204	397.7	29.0	177	393.8	54.0	1332	417.2	68.2	73	457.5	64.8	0.86	-7.07 **
	16	201	390.9	25.9	159	396.3	52.8	--	--	--	94	451.2	65.6	-1.17	--
	17	202	384.1	25.3	176	377.2	45.1	241	423.9	272.3	71	457.6	75.5	1.79	-2.26 *
60sec sit-up (times)	10	203	35.4	9.7	105	25.0	10.2	687	24.8	9.3	99	24.9	8.4	9.42 **	15.00 **
	11	204	35.7	10.0	135	27.6	8.6	745	27.2	8.9	80	26.3	9.8	7.97 **	10.98 **
	12	206	39.1	8.8	122	34.2	7.2	1895	31.8	9.1	77	28.2	8.0	5.49 **	11.27 **
	13	204	45.3	7.9	108	38.1	6.8	1829	34.3	8.3	87	31.2	7.0	8.45 **	18.96 **
	14	206	48.3	7.5	118	38.3	6.8	1643	36.7	8.8	101	32.2	8.8	12.22 **	20.39 **
	15	205	48.9	7.2	188	36.9	7.1	1334	37.1	9.8	81	33.9	5.9	16.66 **	20.73 **
	16	201	47.1	7.3	166	37.6	8.3	38	35.8	5.6	102	33.6	7.0	11.54 **	10.76 **
	17	203	46.2	6.7	175	38.9	10.6	240	35.1	7.5	82	34.0	6.0	7.87 **	16.41 **
pull-ups (times)	10	198	14.8	5.5	104	8.1	6.5	671	9.2	7.8	98	4.6	4.4	8.90 **	11.16 **
	11	185	9.3	4.5	136	9.5	7.4	741	9.8	7.3	77	4.7	4.3	-0.28	-1.14
	12	168	6.6	7.5	122	1.4	2.2	748	5.8	5.4	54	0.9	1.9	8.49 **	1.28
	13	182	6.1	6.9	114	2.5	2.7	536	7.2	5.7	71	1.7	2.5	6.36 **	-1.91
	14	206	6.8	5.2	109	3.6	3.1	294	8.5	5.2	96	2.4	2.6	6.73 **	-3.61 **
	15	204	8.2	5.0	186	5.2	4.6	152	10.2	5.6	79	3.7	3.4	6.07 **	-3.57 **
	16	201	8.2	4.0	165	6.2	4.3	10	4.8	3.7	99	4.3	3.5	4.55 **	2.83 **
	17	203	10.1	4.8	176	7.4	5.1	10	9.7	8.7	80	4.5	3.2	5.30 **	0.15
sit and reach (cm)	10	203	8.5	5.7	105	6.7	5.3	586	2.2	6.7	99	2.7	5.8	2.80 **	13.01 **
	11	200	10.7	7.5	138	6.1	5.4	635	2.6	6.6	80	2.4	6.5	6.49 **	13.62 **
	12	203	7.0	5.2	119	6.9	6.4	1413	2.7	8.0	77	2.1	6.7	0.20	8.94 **
	13	197	7.1	5.7	114	7.6	6.7	1342	2.9	8.6	87	2.6	6.8	-0.67	8.94 **
	14	206	11.2	4.8	116	10.1	6.2	1322	4.9	8.7	101	3.2	7.8	1.67	15.34 **
	15	204	10.3	5.7	186	7.9	8.3	1110	8.5	7.4	81	5.9	7.0	3.31 **	3.95 **
	16	201	15.0	6.1	166	9.6	8.6	--	--	--	102	6.5	7.6	6.80 **	--
	17	203	11.5	5.5	175	9.3	8.4	233	8.2	7.9	82	8.6	8.3	2.89 **	5.05 **
skin-fold thickness total (mm)	10	203	24.7	9.3	103	28.8	8.7	556	24.0	--	99	20.6	7.8	-3.83 **	1.07
	11	204	26.6	10.0	138	25.8	9.2	640	23.1	--	79	17.5	7.1	5.00 **	3.37 **
	12	205	28.2	11.5	123	22.4	9.7	1839	21.1	--	75	17.4	6.6	4.85 **	8.79 **
	13	205	25.2	7.9	118	20.4	6.5	1856	18.3	--	85	15.9	5.4	5.94 **	12.59 **
	14	206	26.1	8.3	120	21.6	7.5	1661	18.8	--	88	15.7	5.8	4.99 **	12.72 **
	15	205	24.3	8.5	183	24.0	8.9	1390	18.8	--	79	15.0	5.3	0.30	9.31 **
	16	201	24.9	9.1	165	28.9	10.7	38	16.9	--	100	15.0	5.3	-1.90	12.42 **
	17	203	24.5	9.9	175	23.8	12.0	245	17.9	--	80	14.3	4.3	0.55	9.42 **

* p < 0.05 ** p < 0.01



Significance of exercise / sports



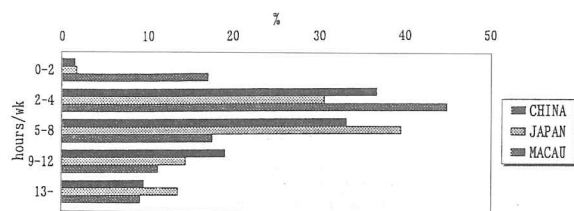


Fig.17 Time length for sports
(elementary school, male)

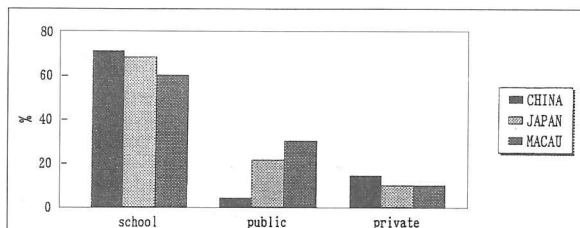


Fig.20 Sports facility of frequent usage
(elementary school, male)

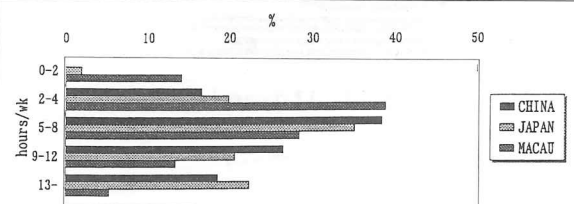


Fig.18 Time length for sports
(junior high school, male)

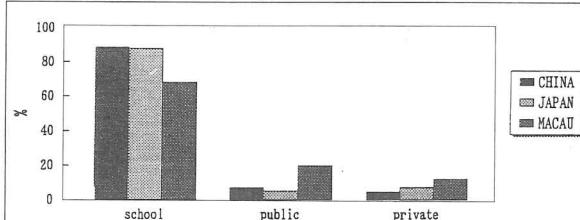


Fig.21 Sports facility of frequent usage
(junior high school, male)

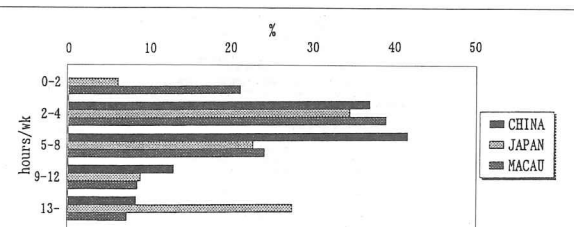


Fig.19 Time length for sports
(senior high school, male)

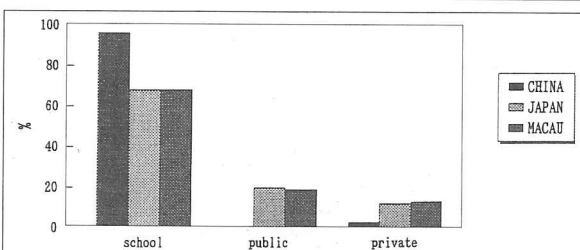


Fig.22 Sports facility of frequent usage
(senior high school, male)

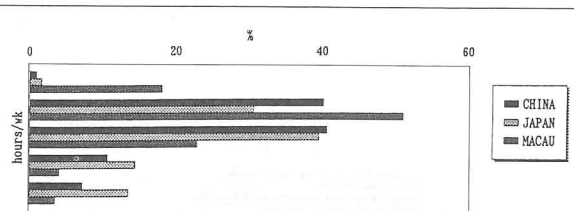


Fig.23 Time length for sports
(elementary school, female)

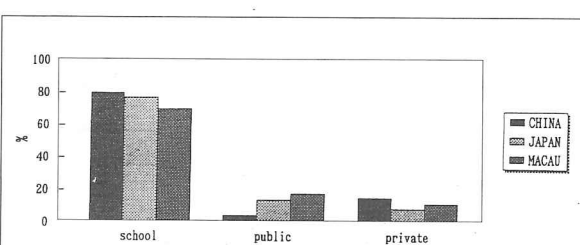


Fig.26 Sports facility of frequent usage
(elementary school, female)

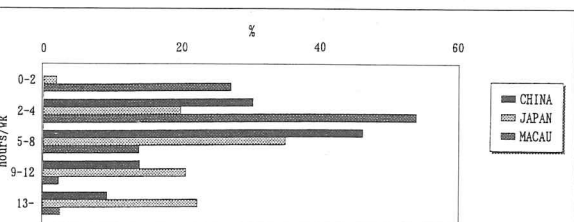


Fig.24 Time length for sports
(junior high school, female)

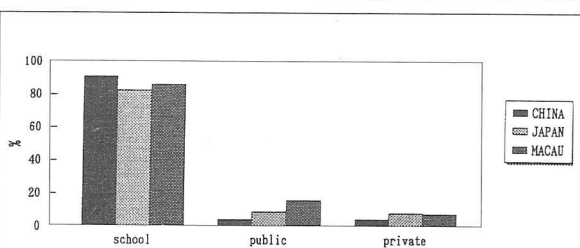


Fig.27 Sports facility of frequent usage
(junior high school, female)

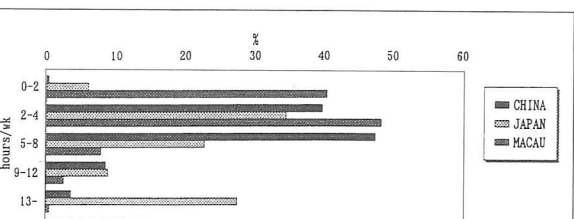


Fig.25 Time length for sports
(senior high school, female)

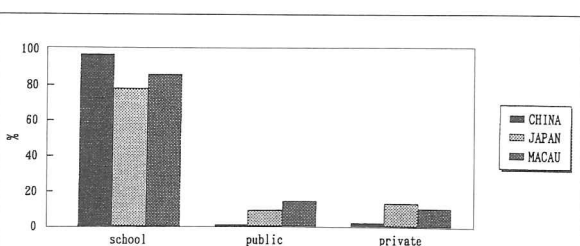


Fig.28 Sports facility of frequent usage
(senior high school, female)

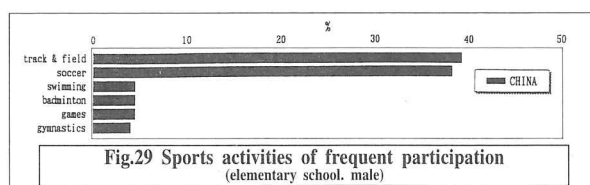


Fig.29 Sports activities of frequent participation (elementary school, male)

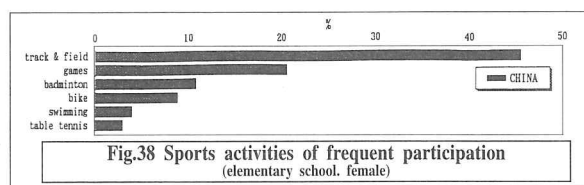


Fig.38 Sports activities of frequent participation (elementary school, female)

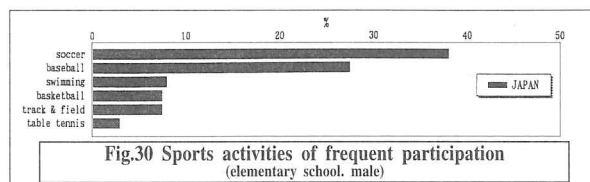


Fig.30 Sports activities of frequent participation (elementary school, male)

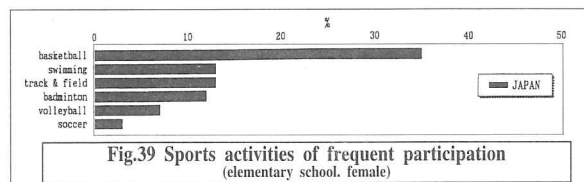


Fig.39 Sports activities of frequent participation (elementary school, female)

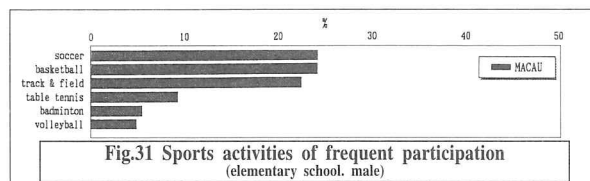


Fig.31 Sports activities of frequent participation (elementary school, male)

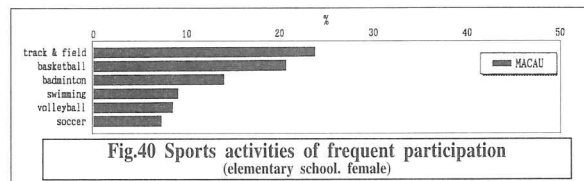


Fig.40 Sports activities of frequent participation (elementary school, female)

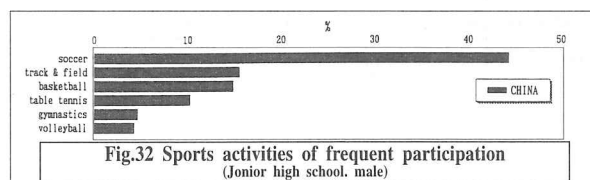


Fig.32 Sports activities of frequent participation (Junior high school, male)

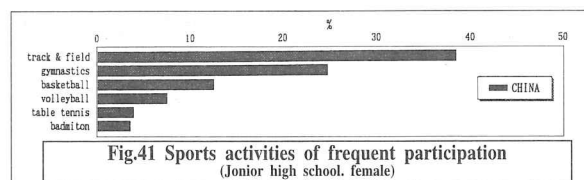


Fig.41 Sports activities of frequent participation (Junior high school, female)

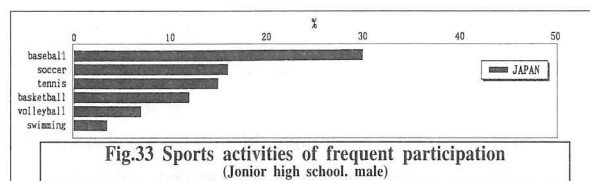


Fig.33 Sports activities of frequent participation (Junior high school, male)

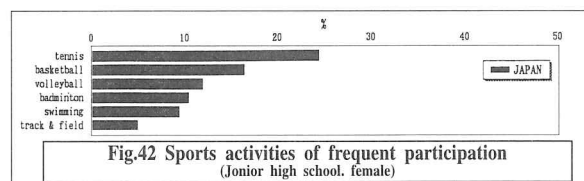


Fig.42 Sports activities of frequent participation (Junior high school, female)

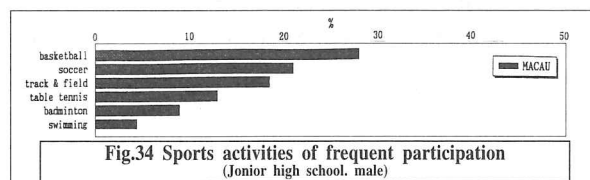


Fig.34 Sports activities of frequent participation (Junior high school, male)

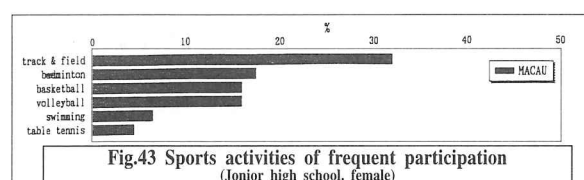


Fig.43 Sports activities of frequent participation (Junior high school, female)

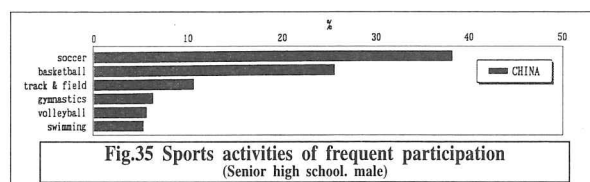


Fig.35 Sports activities of frequent participation (Senior high school, male)

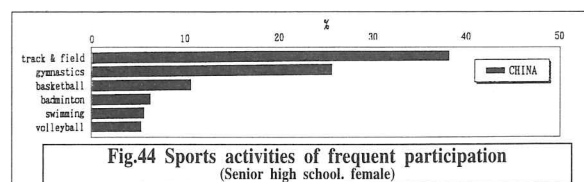


Fig.44 Sports activities of frequent participation (Senior high school, female)

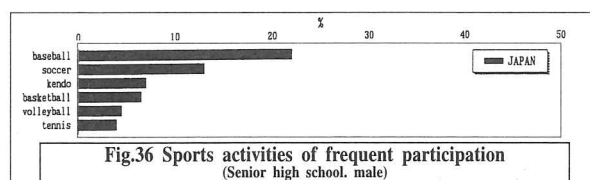


Fig.36 Sports activities of frequent participation (Senior high school, male)

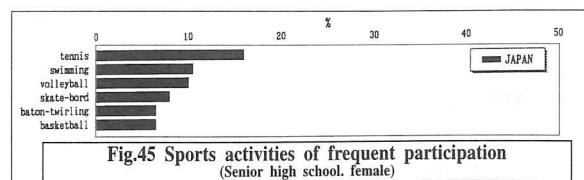


Fig.45 Sports activities of frequent participation (Senior high school, female)

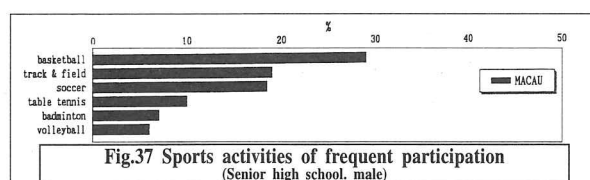


Fig.37 Sports activities of frequent participation (Senior high school, male)

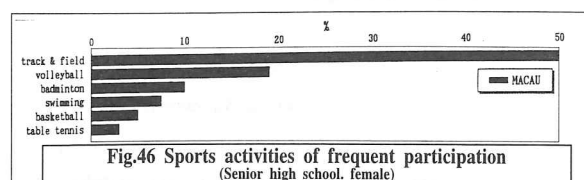


Fig.46 Sports activities of frequent participation (Senior high school, female)