

**Sport Participation of Hong Kong
Children and Youth: Relation to
Academic Performance and Perceived
Ability**

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Abstract

A pervading notion of teachers, school administrators and parents in Hong Kong is that academic success in school and involvement in exercise and sport are conflicting pursuits. Time not spent on studying is thought to be wasted and to jeopardise academic results. The present study's purposes were to examine whether there is ground for assuming a negative relationship between sport involvement and academic performance and to determine the relationship of perceived ability/fitness with academic performance and sport participation characteristics. A representative random sample of 4,650 school children and youth, males and females, from Primary grade 5 to Secondary grade 7 in Hong Kong completed a questionnaire inquiring about the nature and extent of their sport and physical activity participation outside of their compulsory physical education classes during the previous school year, their reasons for participation, non participation and withdrawal, and their preferences and dislikes for sports and physical activities. They were also asked to rate their own academic performance on a 4-point scale as well as their own physical ability and fitness level.

Results of one- and two-way ANOVAs indicated that 'good' academic performers participated significantly more frequently in sport and exercise than 'average', 'below average' and 'poor' performers ($p < .0001$), and 'average' more than 'poor' ($p = .013$). This trend was significantly stronger in the females than the males ($p = .0006$) and present in all age groups. For the participation index, a measure of extent of participation, the same pattern was significant for the females ($p < .0001$) and for the two younger age groups ($p < .05$), but not for the males and the older age groups. There were significant differences among the academic performance groups with regard to strength of reasons for sport participation, non participation and withdrawal, but only small differences in their preferences and dislikes for specific sports and activities. There was, however, also evidence for the existence of a slight curvilinear relationship whereby both "good" and "poor" academic performance groups showed different values than the "average" and "below average" groups.

Differences among perceived ability groups with respect to their academic performance and frequency or intensity of participation were even more pronounced with no evidence of a non-linear relationship. While the correlation coefficients between sport participation variables and academic performance were generally low and often non significant, the correlations between perceived ability/fitness and academic performance and with participation characteristics were generally highly significant and consistent across genders and age levels albeit low to modest in magnitude.

The above results indicate that the better achievers in academic subjects are as a group the more frequent participants with stronger motives for involvement in sport and physical activity, and that the fear of Hong Kong parents and teachers, that sport participation could be a threat to academic achievement, appears unfounded. The study was not designed to answer the question why academically better students would tend to be the more physically active ones, but three potential factors, causality, selection and interference, were considered as explanations.

Acknowledgements

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I should like to warmly thank the Principals and responsible teachers of the participating thirty schools for their co-operation by permitting the administration of the questionnaires, donating class time, providing class rooms and in some instances even assisting in the administration of the instrument. A list of the participating schools and their co-operating staff is included in Appendix A of this report in recognition of their contributions.

My sincere appreciation also for the 4,690 children and youth in the participating Hong Kong primary and secondary schools who must be commended for completing this questionnaire so conscientiously.

The research assistants who have contributed to this project, Cindy Sit, Suki Chan, Kelvin Ng, and Michelle Blaydon are gratefully acknowledged here as well. Their dedicated performance in tasks such as making arrangements with the schools, administering the questionnaire, data checking, entering and managing, and data analysis greatly helped in the realisation of this report.

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SPORT PARTICIPATION OF HONG KONG CHILDREN AND YOUTH: RELATION TO ACADEMIC PERFORMANCE AND PERCEIVED ABILITY

Introduction

This report comprises the results of a study funded by the Committee on Research and Conference Grants (CRGC) of the University of Hong Kong. This study was carried out in conjunction with a larger project for the Hong Kong Sports Development Board (HKSDB), the report on which was recently completed (Lindner, 1997). The purpose of the HKSDB study was to examine sport participation patterns in Hong Kong school children and youth with regard to frequency and extent of involvement, reasons for participation, non participation and withdrawal from sport, and preferences and dislikes of specific sports and physical activities. The present report focuses on self-rated capacities of the subjects in the HKSDB study, including perceived academic performance and perceived physical ability, and their relationships with characteristics of sport participation. Since this study constitutes aspects of the larger sport participation survey, parts of the introduction to this report and the method section are identical to those in the HKSDB report (Lindner, 1997).

Prior to the present HKSDB/CRGC project, data on participation in sport or recreational pastimes have been collected in a number of recent studies in Hong Kong (Fu, 1993a, 1993b; Hong Kong Sports Development Board, 1997; Lindner & Speak, 1995a, 1995b, 1995c; Ng, 1984; Sivan & Robertson, 1994; Speak, Lindner, & Li, 1994), but these left many questions unanswered.

A recent large-scale telephone survey on sport participation by Hong Kong residents aged 15 years and older (Hong Kong Sports Development Board, 1997) has provided a wealth of information on adult sport participation patterns in the Territory, but a similar study has not been conducted for school-aged subjects. The leisure behaviour of Hong Kong secondary school pupils was surveyed by Ng (1984), who reported that nearly one-third of the male respondents listed physical activities as the leisure type most frequently participated in (compared to 27% for television watching), whereas only 15% of the females selected physical activities as their primary leisure behaviour (compared to 36% for television watching). While these results are informative, they are difficult to interpret when one wishes to assess extent of sport participation. Firstly, there was no reference made to absolute time spent on the leisure activities, and secondly there was no information on level or intensity of participation. Sivan and Robertson (1994) have reported on the use of and demand for recreational and sport facilities in Hong Kong and

the level of satisfaction with the facilities, while Lindner and his co-workers (Lindner & Speak, 1995a, 1995b, 1995c; Speak et al., 1994) have examined sport participation issues of university entrants in a series of annual surveys.

The large survey of Hong Kong and Beijing school children between 1989 and 1991 (Fu, 1993a) has provided helpful information on attitudes toward physical activity, perceived favourable conditions for participation, perceived values of sport, and interest and preferences for sports in the Hong Kong population of school children. The design of this study did not allow, however, a specific assessment of participation extent and level in competitive sports, since the survey questions covered both participation and spectatorship, and participation embraced all forms of sporting activities including school physical education classes and informal recreational play.

Questions such as, What is the current extent of participation in competitive sports in the Hong Kong school population?; At what levels does this participation takes place?; What are the motives and barriers for participation in sport ?, were addressed in the HKSDB report (Lindner, 1997) and the reader is referred to this document for the results. Other important questions pertain to the relationship between sport participation and academic performance, and among perceived physical ability, academic performance and sport participation. While the concept of perceived competence or perceived ability plays an important role in theories of motivation and therefore is important in the understanding of participation motives, academic performance is of more practical relevance, particularly in Hong Kong, where there is a pervading notion among school teachers, administrators and parents that academic success and sport involvement are conflicting pursuits.

Thus, the purpose of the present study was to examine the relationships among sport participation characteristics, perceived physical ability and academic performance of Hong Kong school children and youth. A detailed review of the literature in this area is beyond the scope of this report and the findings will be interpreted in the light of previous research in the discussion part.

Method and Procedure

Sample

Initial selection of potential schools to participate in the survey was done by the Hong Kong Department of Education upon request. A list of twenty primary and twenty secondary schools, with ten replacement schools for each level, was provided by the Education Department. Principals of schools on the list were approached in random order and invited to take part in the survey until the co-operation of 15 primary and 15 secondary schools had been secured. From these schools one or two classes were selected at each grade level between P 5 and P 7.

A total of 4690 school children and youth completed the physical activities questionnaire. They were evenly distributed over the nine grade levels sampled and in terms of male-female distribution (Table 1). A majority of the respondents had their home in the New Territories, and a small proportion on Hong Kong Island. Only one Government school was drawn in the random sampling process. It is assumed that the current sample is an adequate representation of children and youth in Hong Kong between grades P 5 and F 7.

Table 1.

Distribution of respondents over grades, genders, home locations, and school types.

Grade	Total	Gender		Home Location			School Type	
		Males	Females	HK	KWL	NT	Gov	Subs
P 4	540	279	259	11	107	413	33	506
P 5	484	258	223	4	102	372	34	448
P 6	536	230	305	38	202	293	0	536
F 1	634	296	338	34	244	349	0	633
F 2	597	309	288	33	217	342	0	597
F 3	554	223	329	27	228	293	0	553
F 4	617	238	379	36	220	357	0	617
F 5	369	113	256	32	177	159	0	369
F 6	355	124	231	23	150	181	0	355
Total	4686	2070	2608	238	1647	2759	67	4614

The distribution of the sample over age groups is presented in Table 2. The age range within grades was large for most grades which makes analysis of the data by grade level inadvisable. Most analyses in the present report were therefore made on the basis of age groups. Since the numbers of respondents in the lowest and the highest age group

were low, these groups were combined with the next higher and lower age groups, respectively. Thus, there were five age groups, i.e., 8-11, 12-13, 14-15, 16-17, and 18-21. *However, since responses referred to the previous year, they will be labelled 7-10, 11-12, 13-14, 15-16, and 17-20.*

Table 2.
Distribution of respondents over age groups

Grade	Age Groups							Average Age
	7-8	9-10	11-12	13-14	15-16	17-18	19-20	
P 4	39	466	27	5	2	0	0	10.51
P 5	1	373	96	10	2	0	0	11.00
P 6	0	34	437	55	6	1	0	12.64
F 1	0	0	479	130	20	1	1	13.01
F 2	0	3	31	536	25	1	0	14.47
F 3	0	0	0	421	122	5	0	14.98
F 4	0	0	0	41	519	52	1	16.50
F 5	0	0	0	0	251	112	5	17.00
F 6	0	0	0	0	35	280	39	18.50
Total	40	876	1070	1198	982	452	46	

Instrument

The questionnaire used in the present study was an age-adjusted adaptation of the survey instrument that has been used with consistent results for the study of sport participation in The University of Hong Kong for the past five years (e.g., Lindner & Speak, 1996, 1995a, 1995b, 1995c; Speak, Lindner, & Li, 1994). This instrument had in turn been influenced by a questionnaire used in a Canadian study of sport participation and withdrawal in children (Lindner, Butcher, & Johns, 1994a, 1994b, 1991). The sport participation instrument is divided into three sections, the first of which asking questions relating to sport participation or non participation during the 1995-1996 school year (outside the compulsory physical education classes): frequency of participation; membership of sport or physical activity clubs; reasons for participation; reasons for non participation; type, frequency, duration and venue of specific activities; and reasons for discontinuation of involvement in a sport in the current year. The second section inquired about desired sport and activities and their desired frequencies and contexts; and about sports or activities the respondent would least be inclined to participate in.

The final section asked for personal information, such as age, sex, home location, and type of school. In addition, two questions asked the respondents to rate themselves

on their own academic performance in school as good, average, below average or poor, and on their own abilities in sports and physical activities as above average, average, below average, or unknown. In the analyses of the last question, the data for subjects who didn't know their own physical ability were deleted. English and Chinese versions of the instrument can be found in Appendix B and C of the full HKSDB report (Lindner, 1997), respectively.

The Chinese translation of the instrument was checked for accuracy and clarity through back translation by a translator naive to the instrument, but familiar with the vernacular in physical education and sport. The Chinese version of the questionnaire was initially pilot-tested on thirty P 5 students, and on one class each of F1, F 3 and F 6 students in May 1996 (N = 133). The format was found to be unsuitable for the lower grades and a revised lay-out was pilot-tested on 74 P5 and P6 pupils. This revised edition, the current instrument, was then checked for reliability through a test-retest procedure with a two-week interval which resulted in coefficients of reliability well in excess of .80.

Procedure

Assistant Principals or the Panel of physical education teachers made arrangements for the administration of the questionnaire. The instrument was distributed and explained by trained research assistants (RAs) to complete classes, usually in a classroom. In exceptional cases, the questionnaire was administered by one of the teachers, who would first have attended a briefing session on the objectives, purposes, and method of the study and instructions about the completion of the instrument. Assistance in the filling out of the pro formas by the respondents was available throughout the session, which was completed in one class period of about 45 minutes.

Data analysis

The completed questionnaires were checked, numbered and coded by RA's and the data entered into Statview (Abacus, 1992) computer files. These files were upon completion amalgamated into a single data file for the whole sample with 87 variables. The whole data set was then checked for errors and outliers and some variables were re-coded for regrouping or for conversion from real to nominal data.

Statistical analyses included descriptive statistics summarising scores and variabilities, frequency distributions to display differences in counts and percentages among groups and subgroups, Pearson Product-Moment correlations among the main dependent variables (academic performance, perceived ability and sport participation characteristics), and one-way and multifactorial Analysis of Variance (ANOVA) to test for significance of differences among groupings of the respondents in a variety of interval- and ratio-type of variables.

Results

The results of the survey are presented in ten sections as follows:

1. Academic performance and participation frequency
2. Academic performance and participation index
3. Academic performance and choice of activities
4. Academic performance and reasons for (non)participation and withdrawal
5. Perceived ability and participation frequency
6. Perceived ability and participation index
7. Perceived ability and choice of activities
8. Perceived ability and reasons for (non)participation and withdrawal
9. Academic performance and perceived physical ability
10. Correlations between Academic Performance, Perceived Physical Ability, and Participation Variables

1. Academic Performance and Participation Frequency

A large majority of the respondents rated themselves as "average" in their academic performance (71.2%; males=69%, females=73%). A "good" self-rating was given by 16.3 % (males=17.4, females=15.4), a "below average" rating by 9.9% (males=10.8, females=9.2), and a "poor" rating by just 123 respondents (2.6%; males=2.9, females=2.4).

There were significant differences in participation frequency among the groups that were based on self-rated academic performance (AP) ($F[3, 4616] = 19.53, p < .0001$), with "good" academic performers participating significantly more frequently than "average", "below average" and "poor" performers ($p < .0001$), and "average performers participating more than "poor" performers ($p = .013$). When these analyses were split by sex, the results were as displayed in Figure 1, with the males showing an overall significance, but no substantial differences between the AP groups ($F[3, 2033] = 2.60, p = .05$), and the females showing larger differences ($F[3, 2576] = 25.28, p < .0001$). For the females, the "good" PA group was higher than the other three ($p < .0001$) and the "average" was higher than "poor" group ($p < .01$). There was a significant Sex by AP group interaction ($F[3, 4609] = 4.11, p = .006$) in which the increase in participation over AP groups was more pronounced for the females.

Therefore, academically good students, particularly females, clearly tended to participate in physical activity more often than the less good students.

The results of the Age groups by AP Groups ANOVA are shown in Figure 2. The same significant trend is discernible in all age groups. In the 7-10 group the "good" academic performers participated significantly more often than the "average" and the "poor" groups; in the 11-12 age groups ($p < .01$), the "good" performers were higher than "below

average" and "poor" ($p < .01$), while in the oldest group only the difference between "good" and "average" reached significance ($p < .05$). When the analysis was split by sex the females showed significant differences in all but the 17-20 group, while the males only had significant differences in the oldest age group.

The above presented results were confirmed when subjects were grouped into participation frequency groups and compared through ANOVA for their self-rated AP. There were significant differences among the participation frequency groups ($F[2, 4623] = 19.10, p < .0001$). The "rarely" group was significantly lower in AP than the "regular" and the "often" groups ($p < .0001$). When the analysis was performed with the sexes separated, the females differed significantly as presented above,, but there were no differences among the male frequency groups ($F[2, 1861] = 1.96, p = .14$). See Figure 3.

The age groups collectively also showed the trend of higher AP self-ratings for more frequent participation, with significant differences in the 7-10 ($p = .03$), 11-12 and 15-16 (both $p < .01$). In the 15-16 group, only the "regular" group had an higher average AP score, while there was a much lower average for the "often" group. See Figure 4.

When the sexes were separated, the females showed significant differences in the 7-10 group ($p < .05$), 11-12 ($p < .001$), and 15-16 ($p < .01$) groups, but the males in none of the age groups.

Table 3 shows that the average participation frequency data from previous university samples are closest to the averages of the "good" AP groups, supporting the belief that the better students, those who proceed eventually to university, tend to have the highest activity participation, whether they are in primary or in secondary school.

Table 3.

Comparisons of average participation frequency scores between the current school sample and those from retrospective data of university freshmen cohorts

<i>School Level</i>	<i>Sex</i>	<i>"Poor"</i>	<i>"Below Ave.range"</i>	<i>"Average"</i>	<i>"Good"</i>	<i>HKU 1995</i>	<i>HKU 1996</i>
Primary	Male	3.00 ±1.61	3.62 ±1.76	3.52 ±1.63	3.75 ±1.69	3.76 ±1.15	--
	Female	2.18 ±1.33	2.67 ±1.70	3.04 ±1.50	3.34 ±1.48	3.44 ±1.16	--
Secondary	Male	3.57 ±1.74	3.46 ±1.63	3.66 ±1.57	3.88 ±1.59	4.12 ±1.01	--
	Female	1.76 ±1.12	2.14 ±1.36	2.47 ±1.32	2.85 ±1.52	3.35 ±0.97	--
F 6	Male	3.50 ±0.71	2.90 ±1.52	3.39 ±1.23	4.24 ±1.18	--	3.73 ±1.25
	Female	2.00 ±1.00	2.48 ±1.33	2.42 ±1.04	2.74 ±1.38	--	3.24 ±0.96

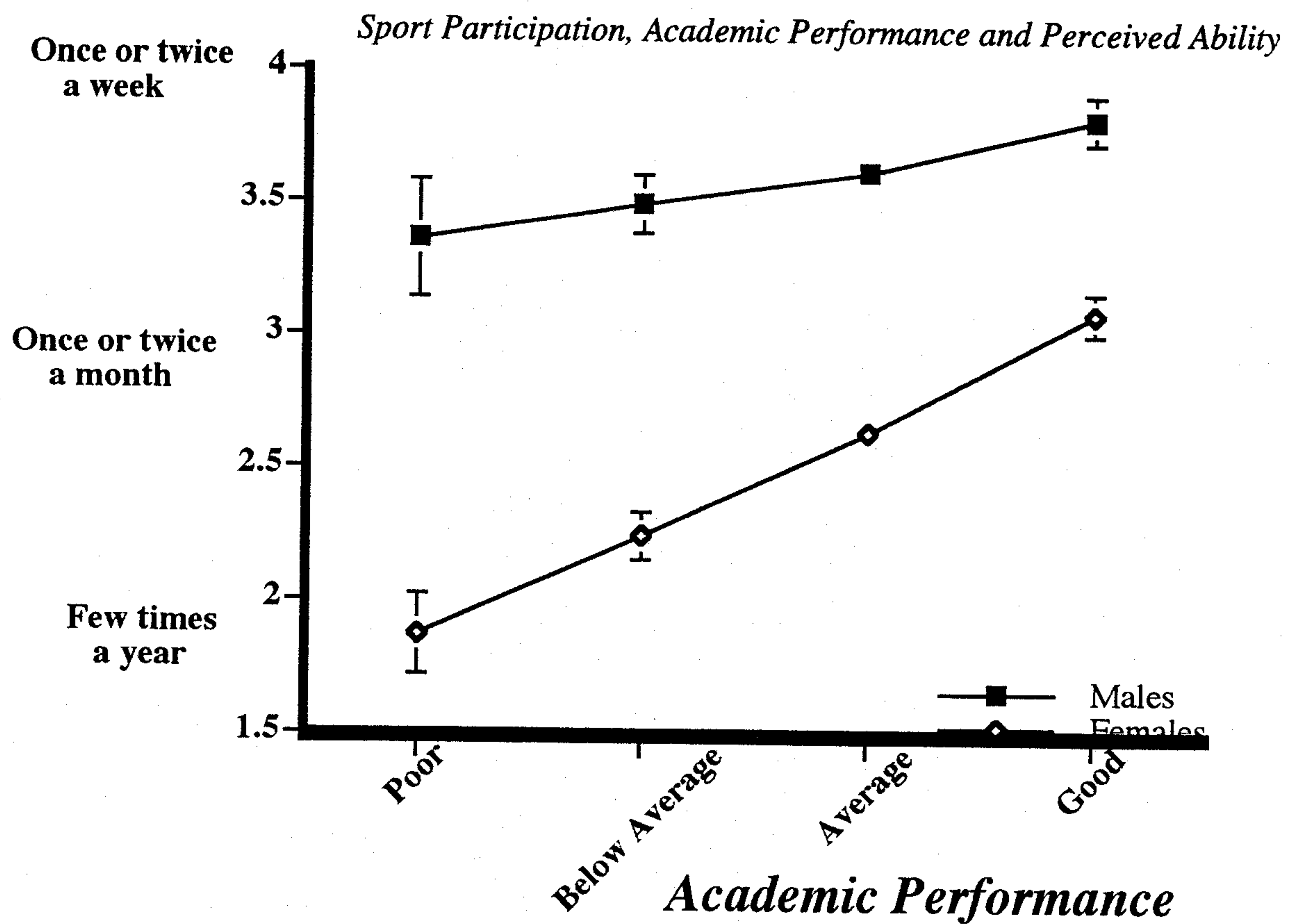


Fig.1. Average frequency of participation and standard errors for male and female academic performance groups.

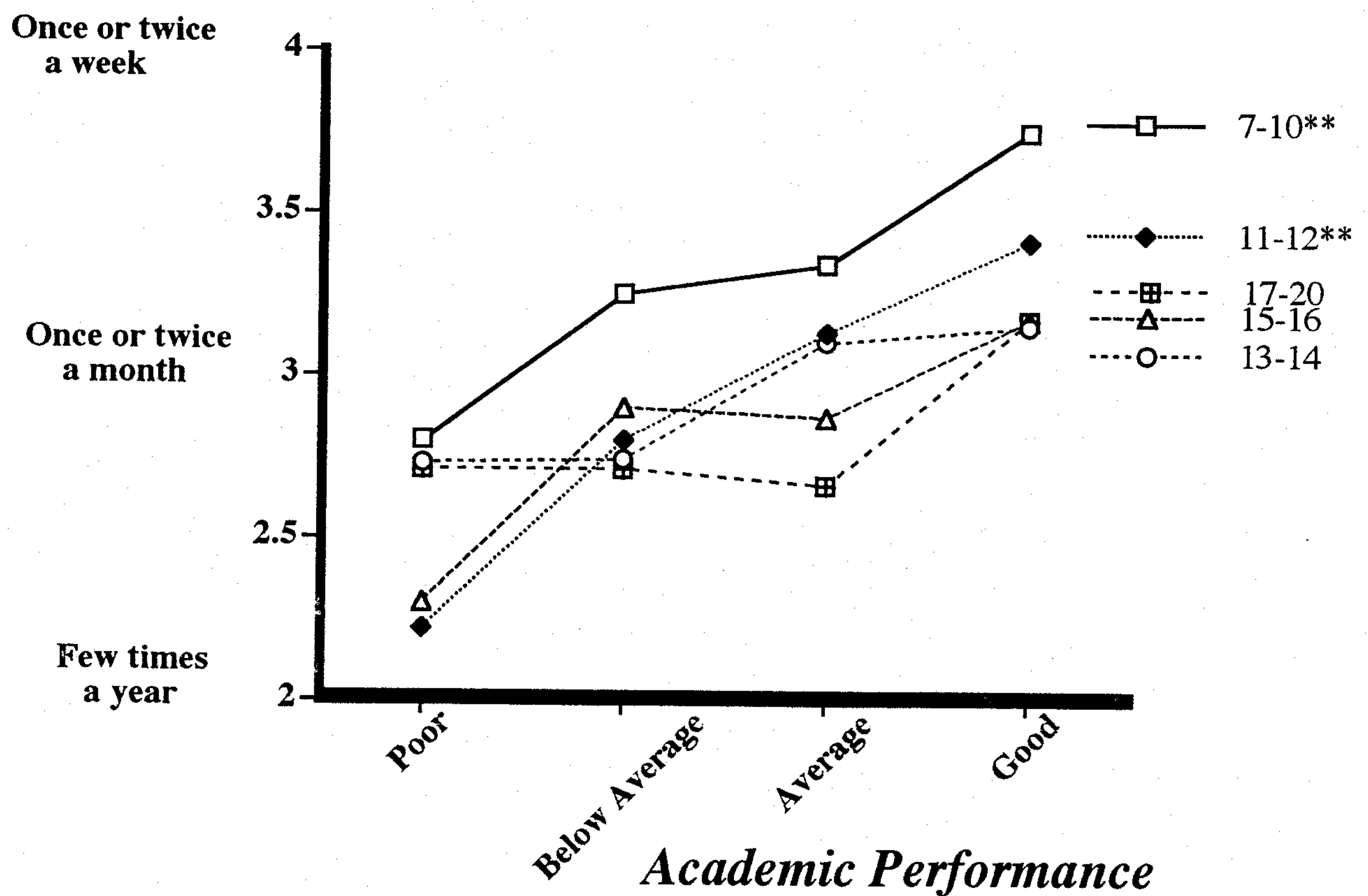


Fig.2. Average frequency of participation for academic performance groups at different age levels.

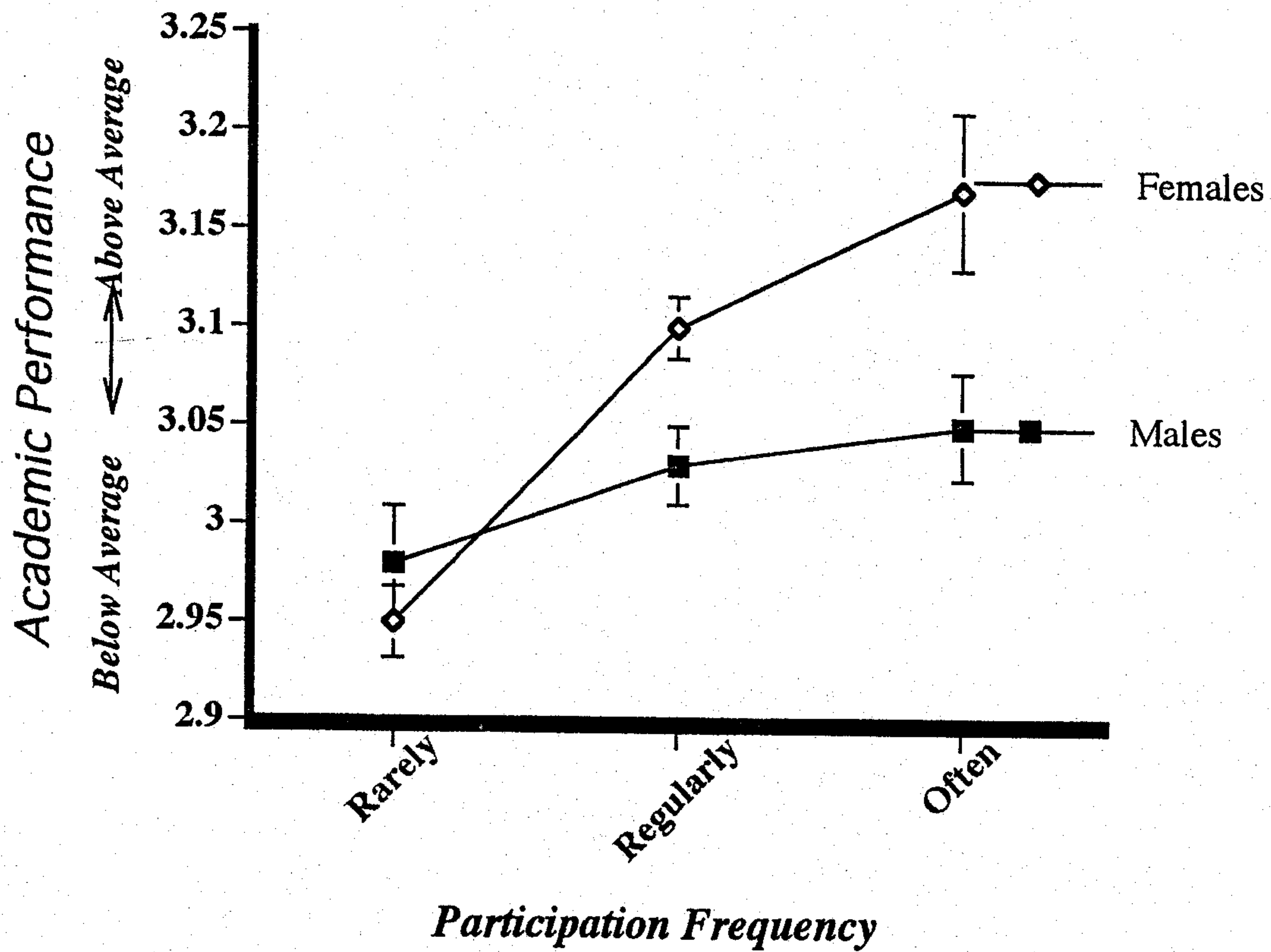


Fig.3. Average academic performance and standard errors for male and female participation frequency groups.

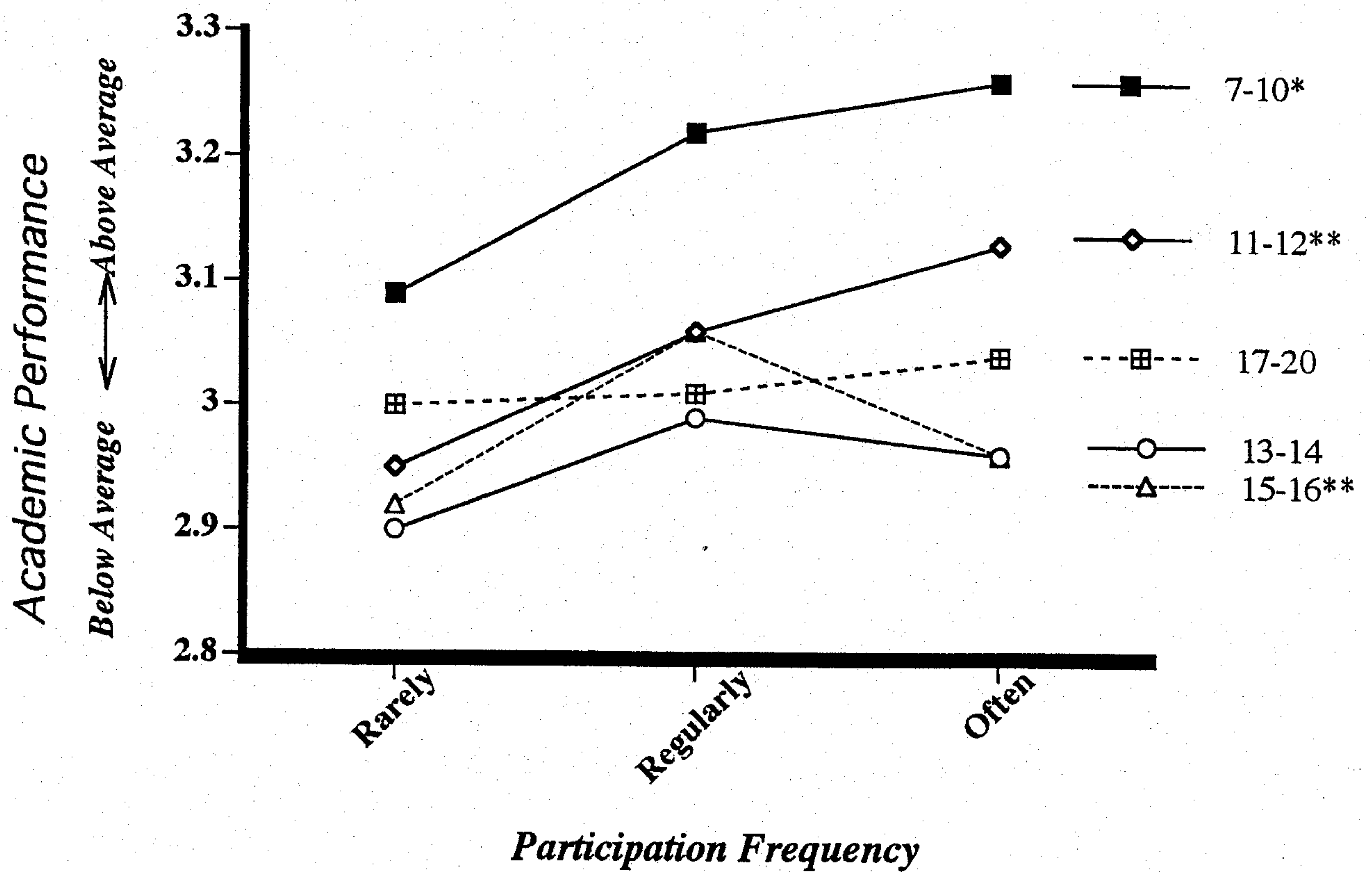


Fig.4. Average academic performance of participation frequency groups. at different age levels.

2. Academic Performance and Participation Index

The index that combined frequency, time per session and months per year confirmed the pattern found for frequency of participation in sport and exercise: the higher the perceived academic performance, the higher the total participation index (Figure 5). The effect of academic performance groups was significant for the females ($F[3, 2590] = 8.18, p < .0001$), but not for the males ($F[3, 2057] = 1.40, p = .241$). There was a significant sex effect ($F[1, 149.87] = 4.11, p = .006$), but no significant interaction effect. Overall, the "good" academic group was significantly higher in participation index than the "average", "below average" and "poor" groups.

When divided into age groups, the pattern became much less pronounced and the main effect of academic performance groups was barely significant ($F[3, 4635] = 3.16, p = .024$). Significant increases over academic groups were only observed for the two youngest age groups, while in the 17-20 year group the "poor" academic performance group was the one with the highest PI (Figure 6.)

3. Academic Performance and Choice of Activities

There were only minor differences among the academic performance groups in their preferences and dislikes for specific sports and activities. As Table 4 shows for the males, swimming was more popular in the "poor" group, but cycling was not ranked among the top seven sports for this group. Golf was attractive to both the "good" and the "poor" groups.

All groups named aerobic dance and dancing as the least desirable activities, but only the "poor" group ranked basketball as an undesirable sport. There was a fairly strong tendency for the "poor" group to select activities with lower percentages than the other academic performance groups.

For the females (Table 5) swimming was also ranked higher by the "poor" group, but the trend of lower percentages of people selecting the activity in this group, as seen in the males, was not observed here. Volleyball declined with lower academic performance groups; camping was only ranked by the two better academic groups; cycling was only listed in the top three sports by the "poor" group, and ice skating received the lowest number of votes in the "good" group.

For the least liked activities, wrestling, boxing, soccer and athletics were named by all groups, but athletics was most disliked by the "poor" group. Jogging was disliked by about 10% of the females in the "average" and the "below average" groups.

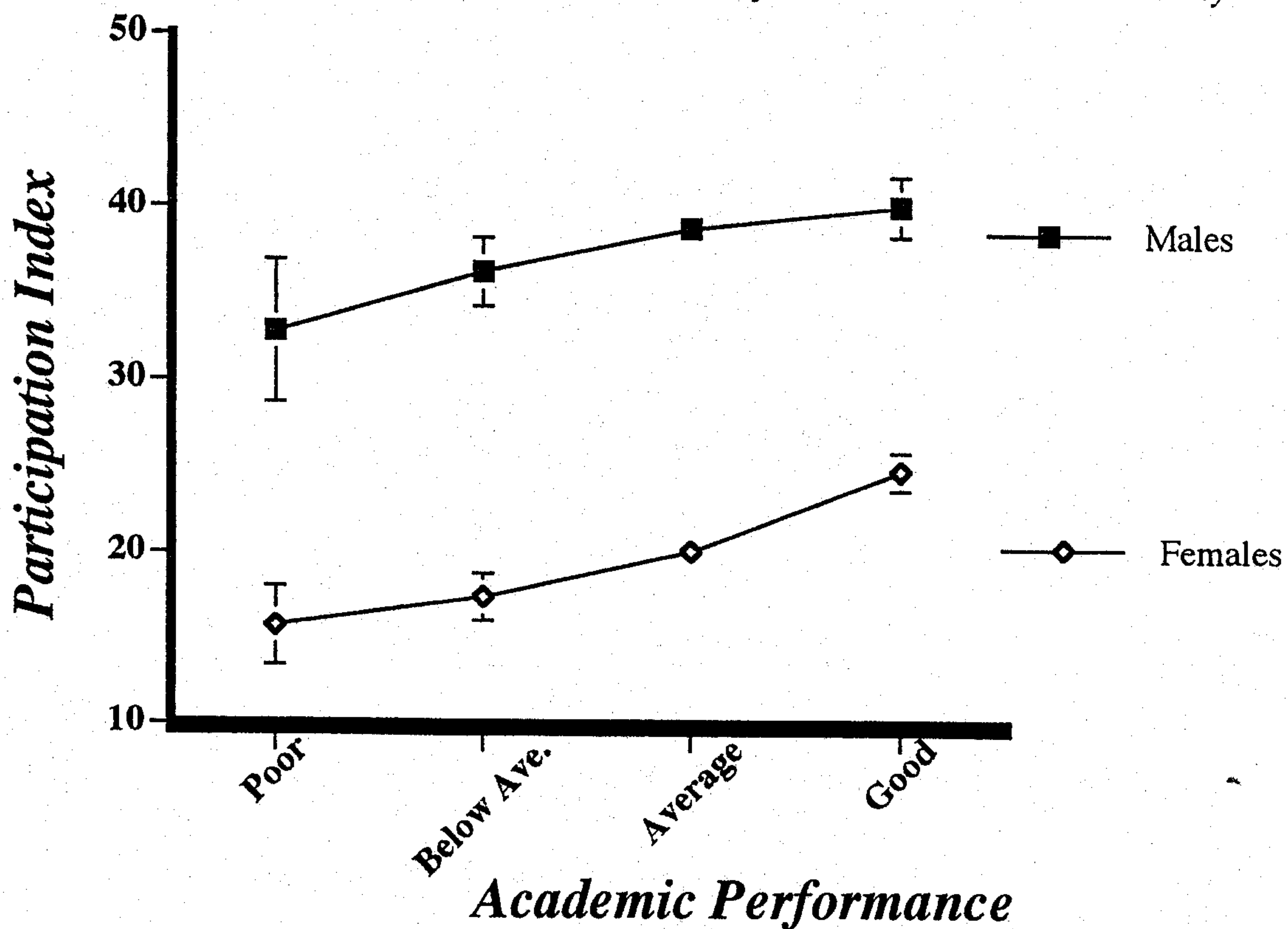


Fig.5. Average Participation Index scores and standard errors for male and female academic performance groups.

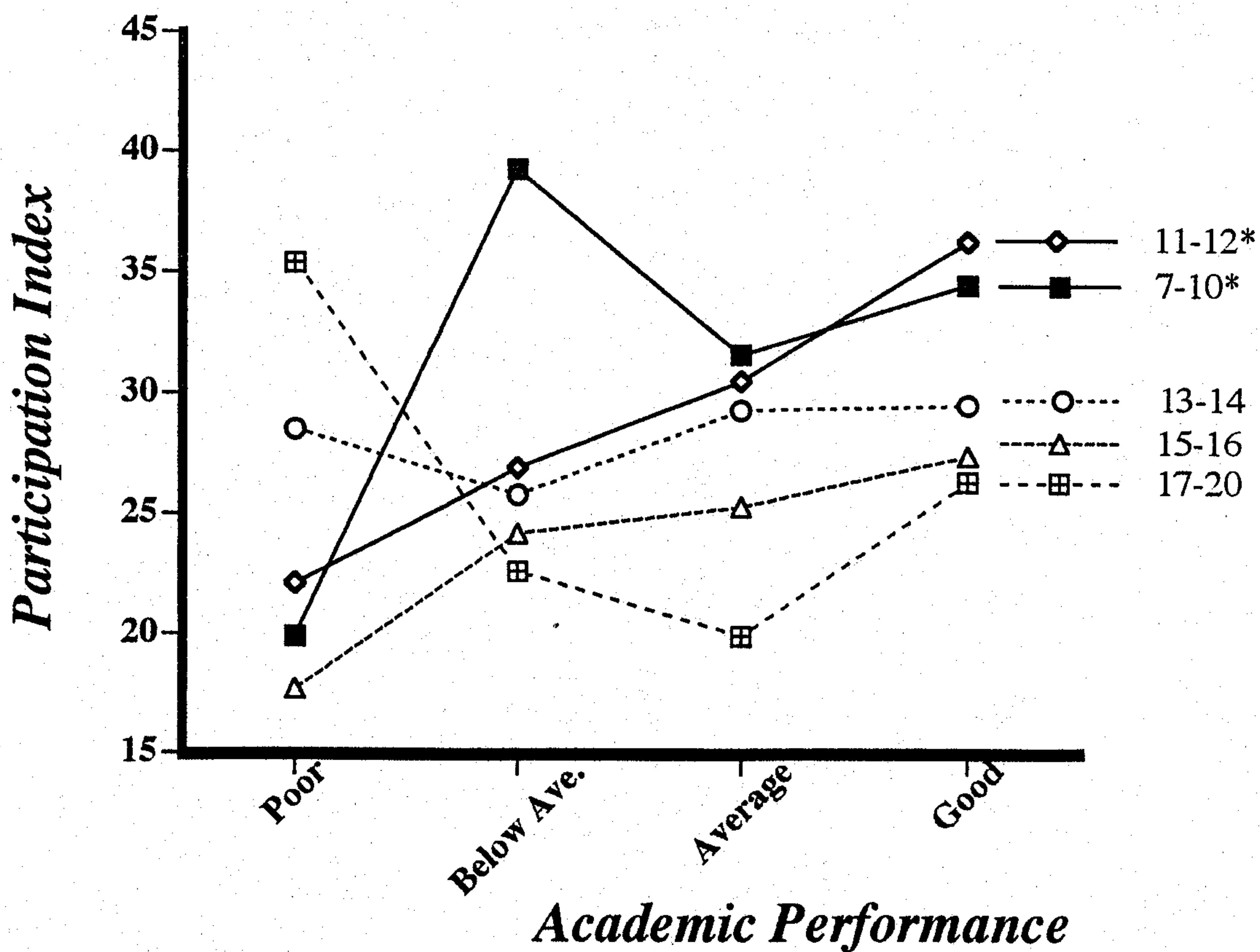


Fig.6. Average Participation Index scores for academic performance groups at different age levels.

Table 4. *Most and least wanted sports by male academic performance groups with percentage of respondents in the group selecting that activity*

Rank	Good	Average	Below Average	Poor
<i>MOST WANTED SPORTS (Males)</i>				
1	Basketball 30.7	Basketball 31.8	Badminton 27.0	Soccer 22.0
2	Soccer 25.1	Soccer 26.9	Soccer 23.4	Basketball 20.3
3	Table Tennis 15.9	Badminton 12.5	Badminton 9.9	Swimming 8.5
4	Badminton 13.4	Table Tennis 11.2	Table Tennis 9.0	Badminton 6.8
5	Swimming 11.7	Swimming 9.3	Swimming 9.0	Table Tennis 3.4
6	Cycling 10.1	Tennis 9.0	Tennis 9.0	Tennis 3.4
7	Golf 7.0	Cycling 8.3	Cycling 7.6	Golf 3.4
<i>LEAST WANTED SPORTS (Males)</i>				
1	Aerobic D. 20.6	Aerobic D. 19.8	Aerobic D. 20.3	Aerobic D. 25.4
2	Dancing 18.4	Dancing 14.4	Dancing 14.4	Dancing 15.2
3	Gymnastics 10.1	Gymnastics 9.8	Soccer 9.8	Athletics 10.2
4	Swimming 8.9	Volleyball 9.8	Swimming 9.9	Basketball 8.5
5	Soccer 8.1	Soccer 8.0	Gymnastics 7.7	Volleyball 6.7

Table 5. *Most and least wanted sports by female academic performance groups with percentage of respondents in the group selecting that activity*

Rank	Good	Average	Below Average	Poor
<i>MOST WANTED SPORTS (Females)</i>				
1	Badminton 25.3	Badminton 24.1	Badminton 21.4	Swimming 30.2
2	Basketball 18.8	Swimming 19.0	Ice Skating 18.1	Badminton 22.2
3	Swimming 18.5	Ice Skating 15.4	Swimming 15.5	Cycling 15.9
4	Volleyball 16.8	Volleyball 14.9	Tennis 14.7	Ice Skating 12.7
5	Tennis 16.0	Tennis 14.7	Basketball 14.7	Basketball 12.7
6	Camping 15.6	Basketball 14.0	Volleyball 14.3	Tennis 11.1
7	Ice Skating 14.5	Camping 8.9	Cycling 10.1	Volleyball 9.5
<i>LEAST WANTED SPORTS (Females)</i>				
1	Soccer 20.3	Wrestling 18.5	Wrestling 15.4	Athletics 19.0
2	Wrestling 16.0	Soccer 17.8	Soccer 12.6	Boxing 15.9
3	Boxing 12.8	Boxing 15.8	Boxing 12.6	Wrestling 15.9
4	Athletics 12.0	Athletics 11.6	Athletics 12.2	Basketball 12.7
5	Basketball 8.8	Jogging 10.5	Jogging 10.9	Soccer/Aer.D 9.5

4. Academic Performance and Reasons for (Non)Participation and Withdrawal

A. Reasons for Participation

Differences between the male academic performance groups were observed in four of the reasons. "Good" students ranked the fitness & health reason, being good at it, and praise from friends and parents higher than the other groups, whereas taking part with friends was a lowly ranked reason for the "poor" group. The fun and wanting to become good reasons showed no significant differences, but the latter reason had significant differences among the female groups, where the "poor", "average" and "good" groups all ranked this reason significantly higher than the "below average" group. A similar pattern was found for the reason being good at it, but here only the "good" academic group differed significantly from "average" and "below average". The praise reason, fun and friends reasons also showed this pattern for the girls, but none of the differences reached the .05 level of significance (Figure 7).

B. Reasons for Non Participation

As displayed in Figure 8, there were significant differences among academic performance groups for five of the eight non participation reasons. Not participating because of wanting to do one's "own thing" was the strongest reason overall, but significantly weaker for the "good" group than for the "below average" group ($p < .01$). Lack of skill ($p < .005$), and not liking the obligation to participate ($p < .05$) were significantly more important to the "below average" group than to the "average" and "good" groups. The "poor" group preferred to watch others participate more so than the "good" academic non participants ($p < .01$), while not having friends or family members who participated was a stronger reason for the "below average" group than for the "good" group ($p < .005$).

The patterns for the males and the females with regard to non participation were very similar, but only the no skill reason reached significance in the male group, where the "below average" academic group was higher than the "average" group ($p < .05$). For the females, significant differences were found for four of the reasons: no skill, prefer to watch others, not wanting the obligation, and no friends, with significant differences as described above.

C. Reasons for Withdrawal from a Sport

Differences among academic performance groups in their reasons for withdrawing from a sport were limited to two items, i.e., time needed for studying which was a significantly more important reason for the "good" group than for the "poor" group ($p < .05$), and getting yelled at by coaches or other players for which a significant difference was observed between the "average" and the "poor" group ($p < .05$). These results are presented in Figure 9.

Within the male academic groups, "good" performers rated studying higher than "below average" respondents ($p < .01$), while the differences for the yelled at reason were predominantly in the female groups where the "poor" group rated this reason significantly higher than the other three groups ($p < .01$).

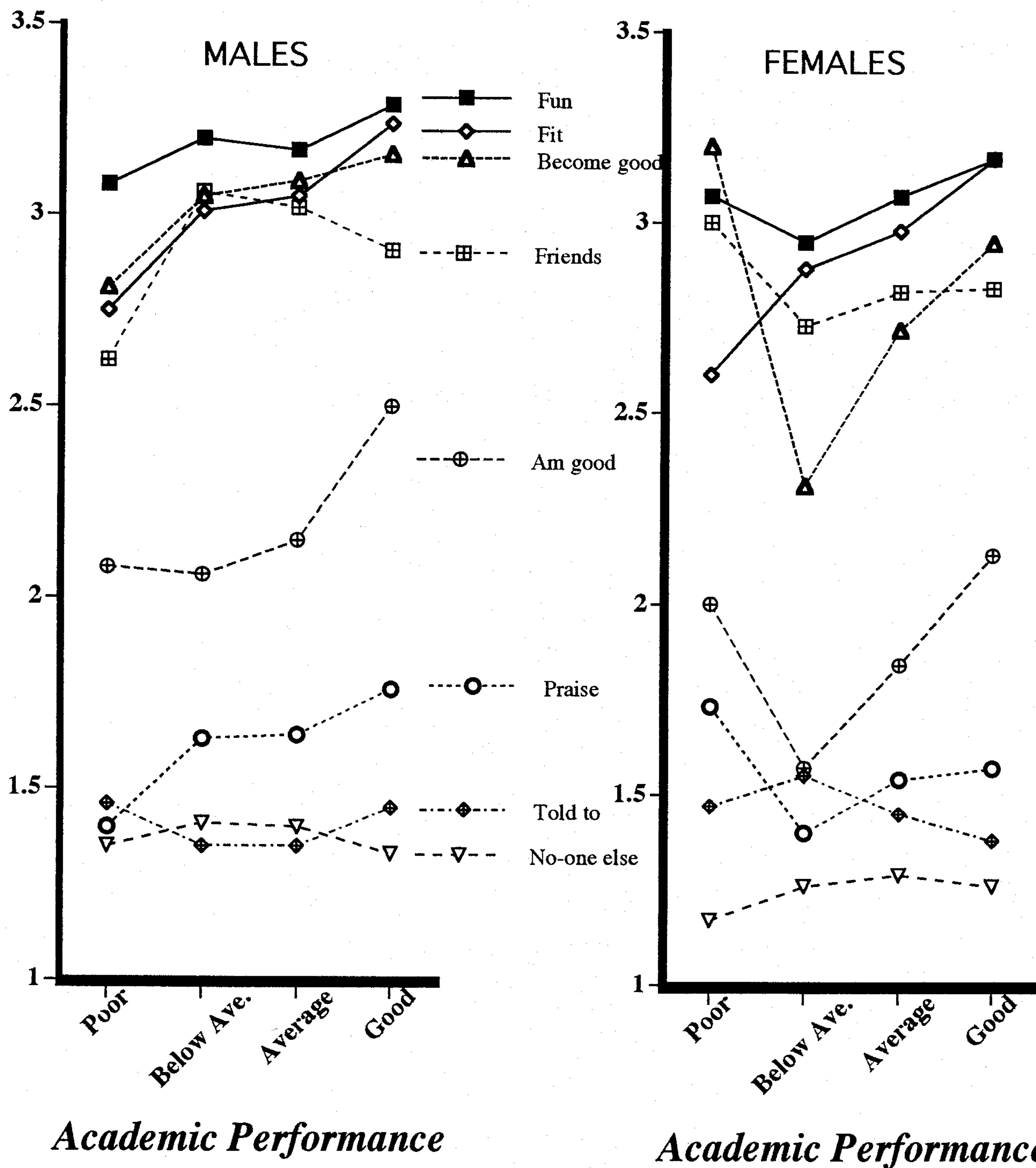


Fig.7. Average strength of participation reasons for male and female academic performance groups.

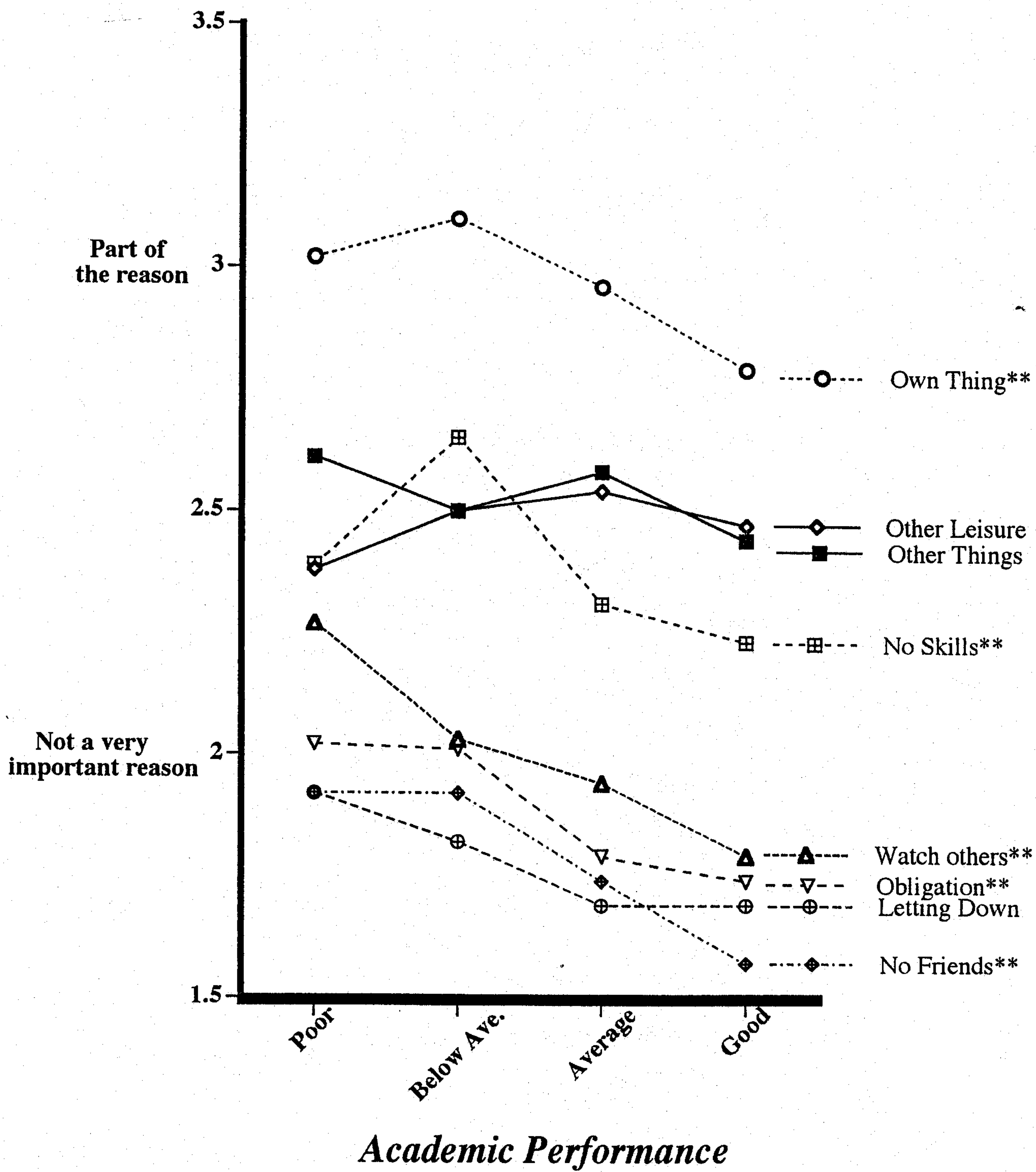


Fig.8. Average strength of non participation reasons for academic performance groups.
(males and females combined)

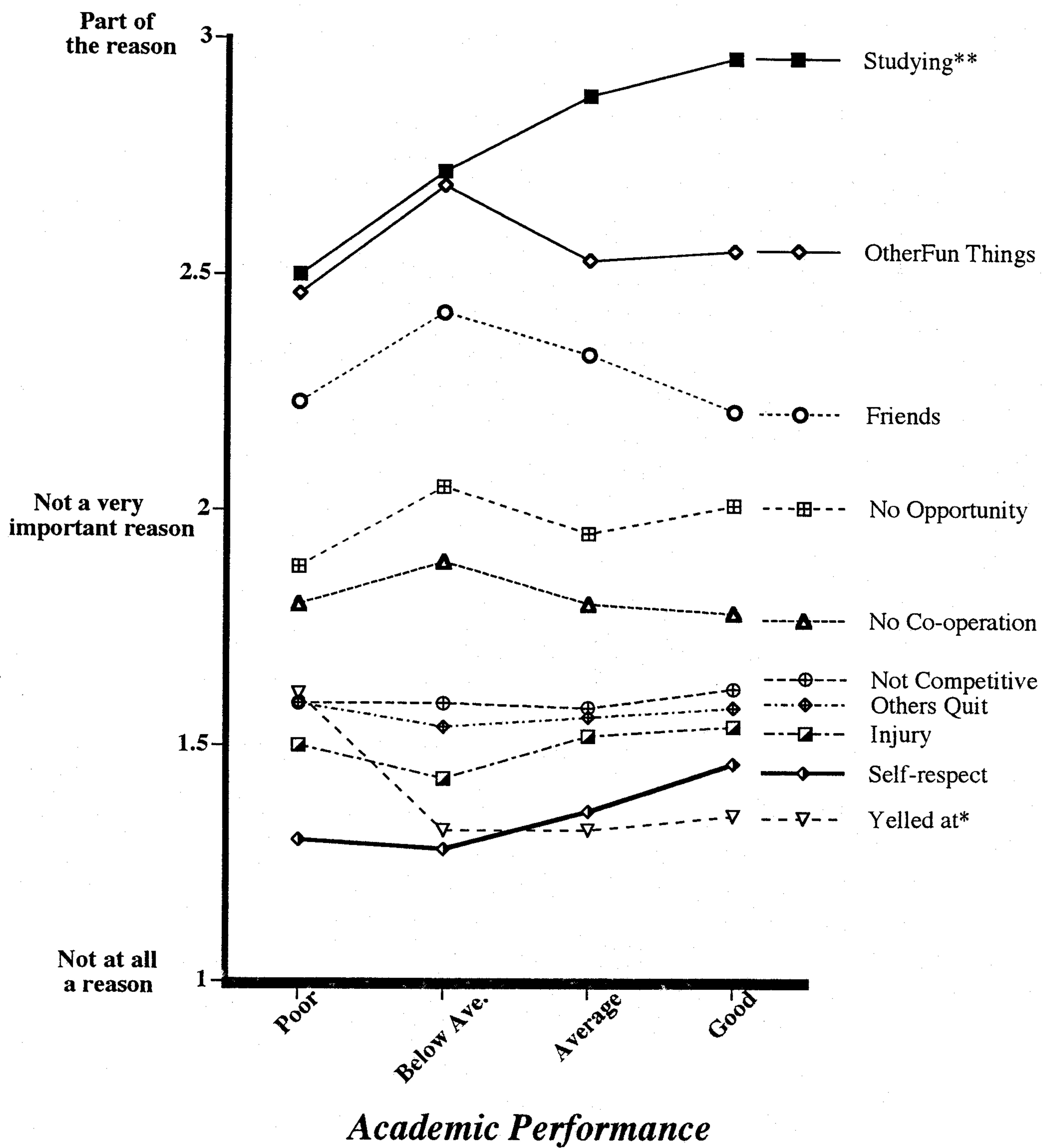


Fig.9. Average strength of withdrawal reasons for academic performance groups. (males and females combined)

5. Perceived Ability and Sport Participation Frequency

The distribution of self-ratings of physical ability (PA) was as follows: 8.2% of the respondents selected the "above average" category (males=12.3, females=4.8); 63% rated themselves as "average" (males=65.5, females=61.0); 18.1% thought of themselves as being "below average" (males=13.6, females=21.6); and 10.8% (males=8.6, females=12.5) did not know how to rate themselves. The latter group will be omitted in the analyses. The youngest age group tended to rate themselves higher in PA than the other groups with a higher percentage in the "above average" rating and a much lower percentage in the "below average" rank.

There were highly significant differences among the PA groups with respect to their average frequency of sport participation with the main effect of PA group significant at the .0001 level for both the males and the females (males: $F[3, 2034] = 26.9, p < .0001$; females: $F[3, 2573] = 75.19, p < .0001$). (see Figure 10). The same pattern was evident within all of the age groups (Figure 11).

This finding was again confirmed when the respondents were grouped according to their frequency of participation and PA was taken as the dependent variable. There were significant differences in PA for the male frequency groups ($F[5, 1859] = 12.71, p < .0001$) with the higher frequency groups having significantly higher PA averages than the lower frequency groups. The same results were obtained for the females ($F[5, 2250] = 41.9, p < .0001$), and for all of the age groups.

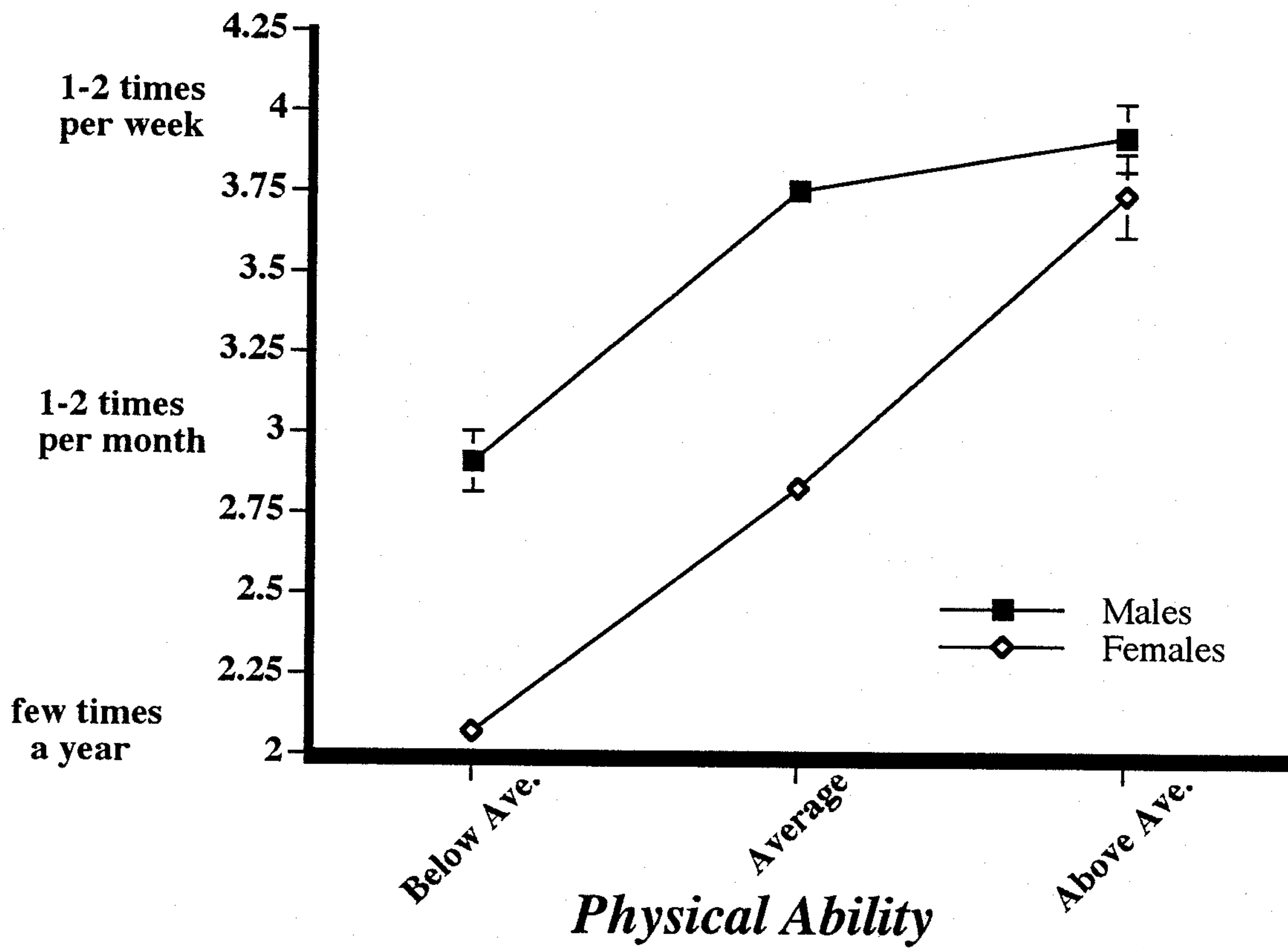


Fig.10. Average frequency of participation and standard errors for male and female perceived physical ability groups.

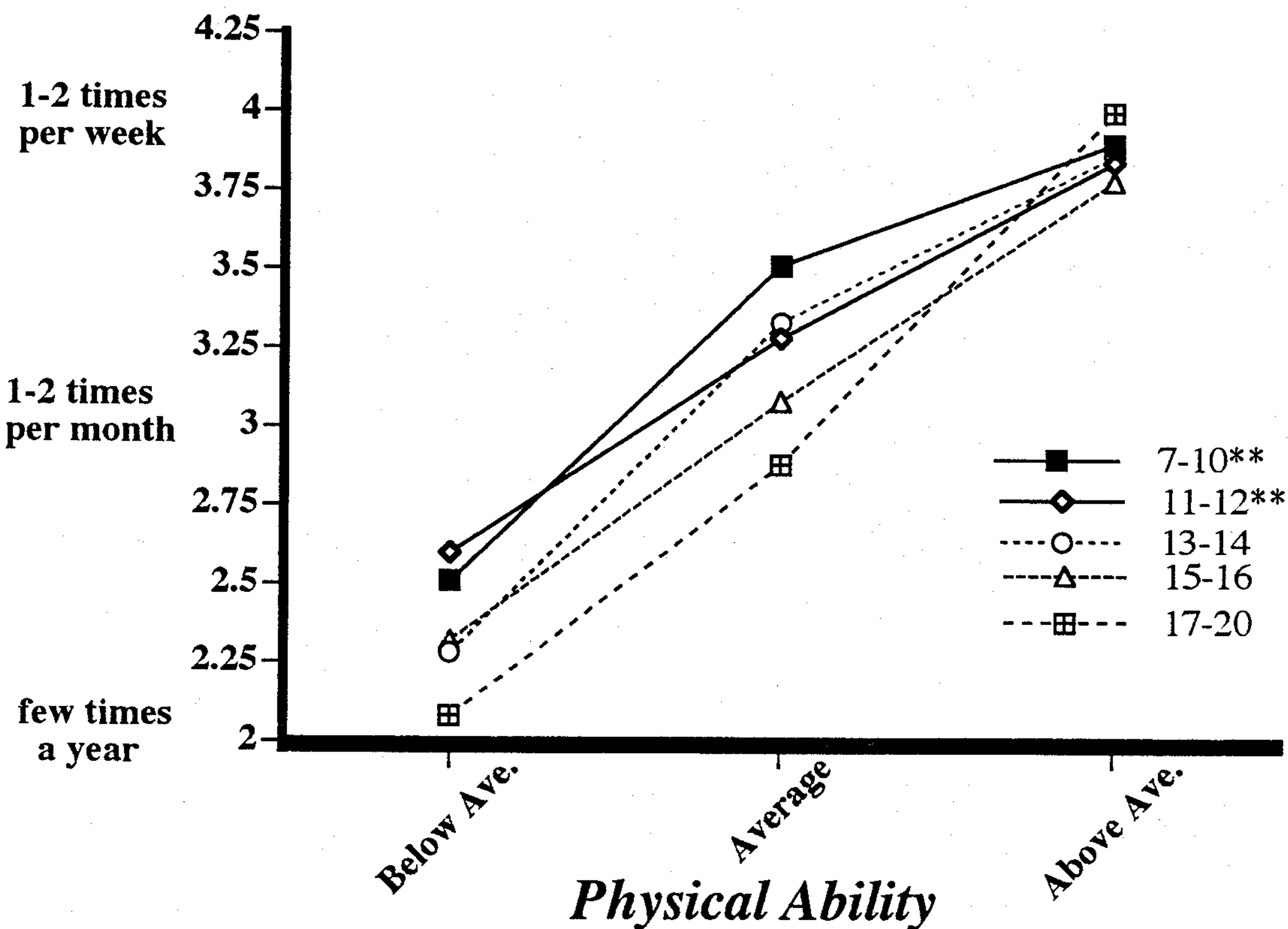


Fig.11. Average frequency of participation for perceived physical ability groups at different age levels.

6. Perceived Ability and Sport Participation Index

The pattern found in the analyses of the participation frequency (see section 6 above) was replicated with the total Participation Index. For both the males and the females the effect of academic grouping was highly significant ($p < .0001$) with respondent groups rating themselves high on physical ability having significantly higher participation indices than those with low self-ratings (Figure 12). Also within all of the age groups the same significant pattern exhibited itself (all $p < .0001$). There was also a significant age group by PA group interaction ($p < .05$) resulting from the older age groups showing the pattern in a more pronounced fashion (Figure 13).

7. Perceived Ability and Choice of Physical Activities

The top two choices for all three male physical ability groups were basketball and soccer, but the percentages selecting were lower in the "below average" group. The "average" and "above average" listed volleyball among their top eight sports, but the "below average" group preferred golf. Volleyball was controversial because it was also ranked high as an unwanted activity in the "average" and "above average" groups, while soccer was controversial in the "below average" group. Athletics and boxing were disliked in the "average" and "below average" groups, respectively (Table 6).

The activity choices in the female physical ability groups showed more diversity than the male groups did. Volleyball and ice skating were ranked highest by the "above average" group, but dropped in popularity across the other ability groups. Badminton and swimming were most popular with the "average" and "below average" groups and these groups also listed camping and squash, while the "above average" group ranked athletics and table tennis in the top eight choices. "Above average" females disliked aerobic dance and dancing, whereas the "average" and "below average" listed athletics and jogging as undesirable (Table 7).

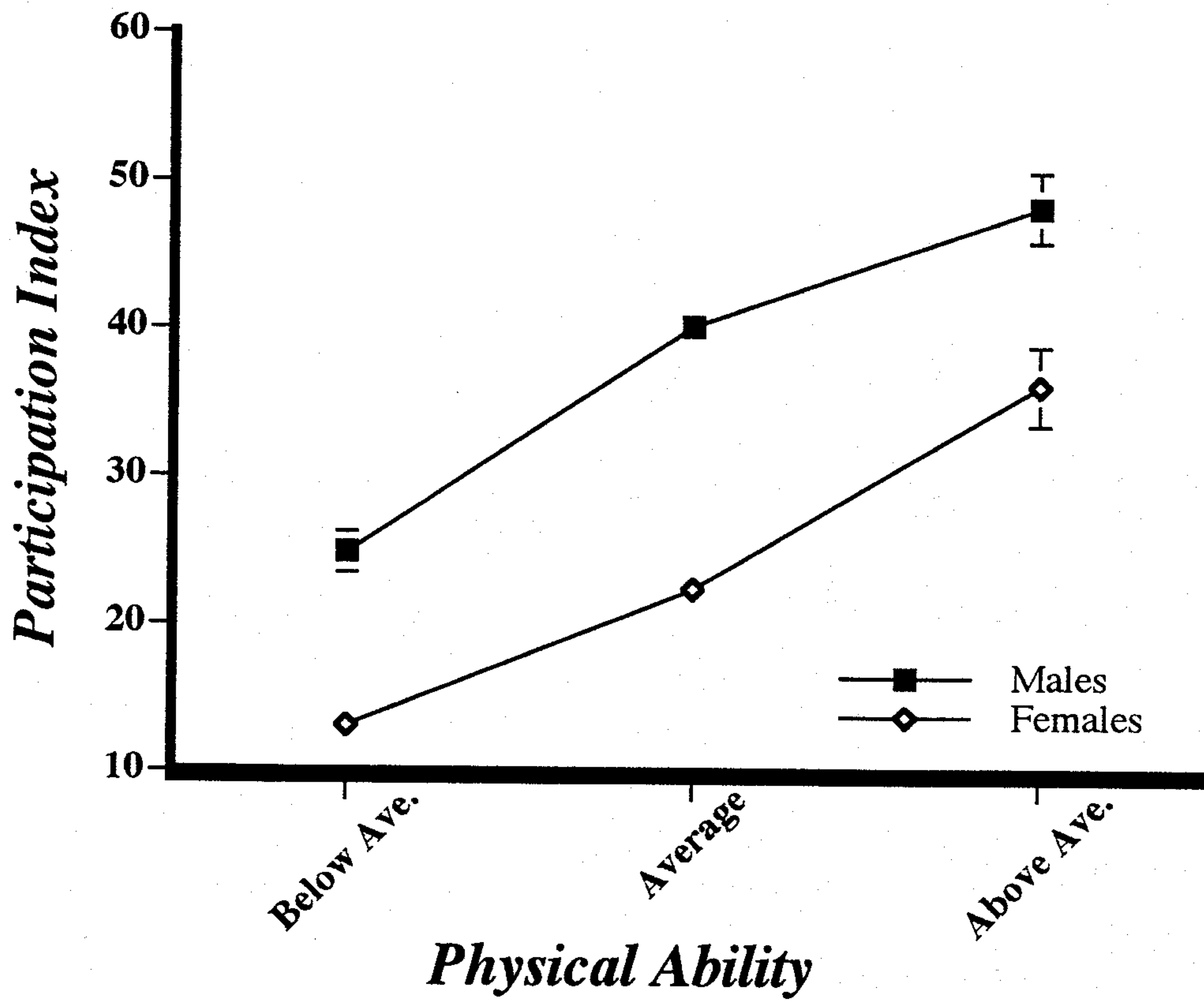


Fig.12. Average participation index scores and standard errors for male and female perceived physical ability groups.

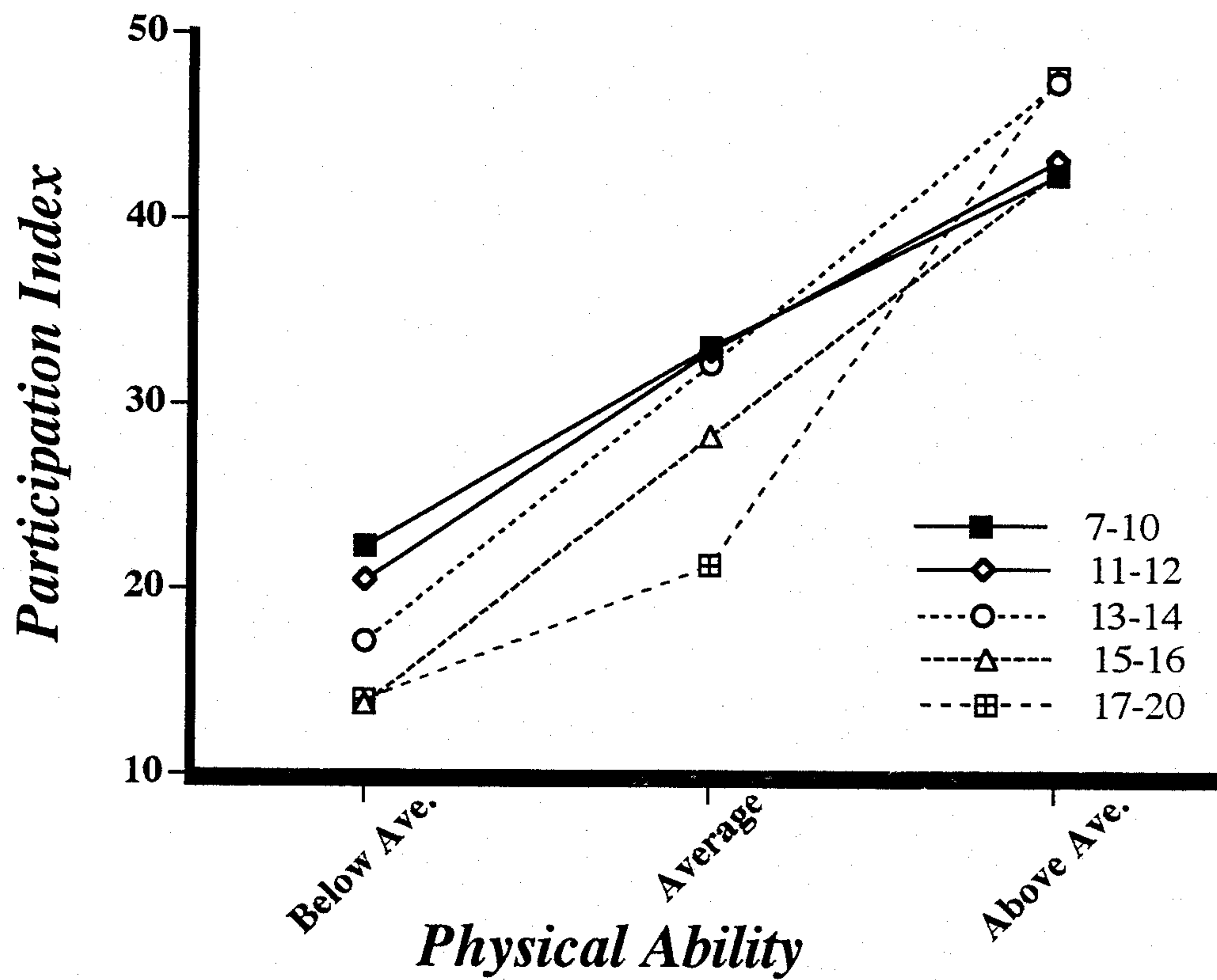


Fig.13. Average participation index scores for perceived physical ability groups at different age levels.

Table 6. *Most and least wanted sports by male perceived physical ability groups with percentage of respondents in the group selecting that activity*

Rank	Above Average	Average	Below Average
MOST WANTED SPORTS (Males)			
1	Basketball 29.5	Basketball 31.9	Badminton 24.6
2	Soccer 23.6	Soccer 28.4	Soccer 15.4
3	Swimming 10.6	Table Tennis 12.2	Badminton 14.6
4	Table Tennis 9.8	Badminton 12.0	Swimming 13.6
5	Badminton 9.4	Swimming 8.9	Cycling 9.6
6	Tennis 9.1	Tennis 8.4	Table Tennis 9.6
7	Cycling 6.7	Cycling 8.4	Golf 8.6
8	Volleyball 5.9	Volleyball 5.7	Tennis 6.4
LEAST WANTED SPORTS (Males)			
1	Aerobic Dance 16.9	Aerobic Dance 20.4	Aerobic Dance 18.9
2	Dancing 15.7	Dancing 18.6	Dancing 16.1
3	Gymnastics 9.1	Volleyball 9.6	Soccer 11.8
4	Volleyball 7.9	Gymnastics 9.3	Gymnastics 10.7
5	Swimming 7.9	Athletics 7.7	Boxing 10.7

Table 7. *Most and least wanted sports by female perceived physical ability groups with percentage of respondents in the group selecting that activity*

Rank	Above Average	Average	Below Average
MOST WANTED SPORTS (Females)			
1	Volleyball 19.0	Badminton 21.2	Badminton 24.8
2	Ice Skating 17.5	Swimming 18.9	Swimming 22.3
3	Swimming 15.9	Basketball 16.3	Tennis 16.8
4	Badminton 15.1	Volleyball 16.1	Ice Skating 14.4
5	Basketball 15.1	Ice Skating 15.9	Volleyball 11.8
6	Tennis 14.3	Tennis 14.9	Basketball 11.6
7	Athletics 12.7	Squash 8.3	Camping 8.9
8	Table Tennis 8.7	Camping 7.8	Squash 8.4
LEAST WANTED SPORTS (Females)			
1	Wrestling 26.2	Wrestling 18.1	Soccer 18.0
2	Boxing 10.7	Soccer 17.7	Wrestling 17.8
3	Aerobic Dance 12.7	Boxing 16.0	Athletics 16.9
4	Dancing 10.3	Athletics 9.9	Boxing 15.5
5	Soccer 9.5	Jogging 9.3	Jogging 13.2

8. Perceived Ability and Reasons for (Non)Participation and Withdrawal

A. Reasons for Participation

When the strength of the motives for activity participation was compared among the PA groups, significant differences were found for the males for the following motives: fun ($p < .05$; "above average" (AA) > "below average" (BA), fitness and health ($p < .005$; AA > A, BA), become good ($p < .0001$; AA > A > BA), friends ($p < .001$; AA < A, BA), and I am good at it ($p < .0001$; AA > A > BA). Thus, respondents with higher PA tended to rank most motives, i.e., competence, fun and praise higher, but they participated significantly less for the reason of being with friends (Figure 14).

The pattern for the female PA groups was similar, but the fun and fitness and health reasons were equally high for all groups. Only praise, I am good, and wanting to become good at it (all $p < .0001$; AA > A > BA) showed significant increases over PA groups, while friends had significant decreases ($p < .0001$; AA < A < BA) (Figure 15). The 'because I was told to participate' reason was significantly less subscribed to by the A and AA groups than by the BA group ($p < .005$), but the nonconformist reason no-one else was significantly higher rated by the AA group ($p < .05$).

B. Reasons for Non Participation

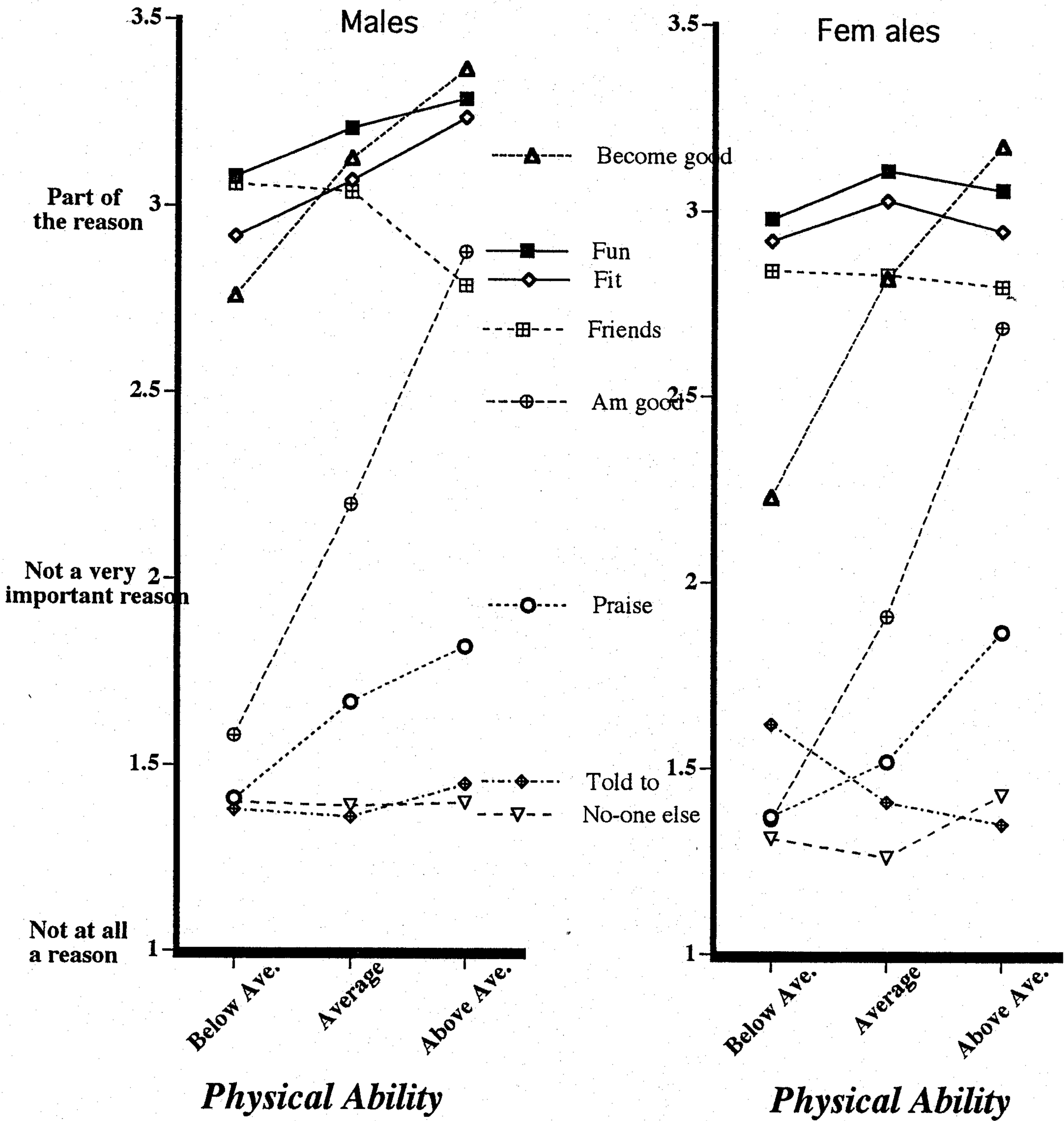
Significant differences among the male PA groups were found for the non participation variables 'succeeding in other important things' ($p < .05$), preference for other leisure activities ($p < .05$; AA < BA), and no skills ($p < .0001$; AA, A < BA), while wanting to do one's 'own thing', no friends, watch others, letting down, and obligation did not show significant differences (Figure 16).

The strength of the non participation reasons was more varied for the female PA groups as shown in Figure 17. Most variables had significant differences in motive strength between the PA groups. Other things, other leisure, 'own thing', watch others and no skills all were significant at the .0001 level with decreasing motive strengths over higher PA self-ratings. Only for the no friend and the letting down reasons were there no significant differences among the PA groups. For the obligation reason ($p < .05$) the AA group had a significantly lower rating than the BA group.

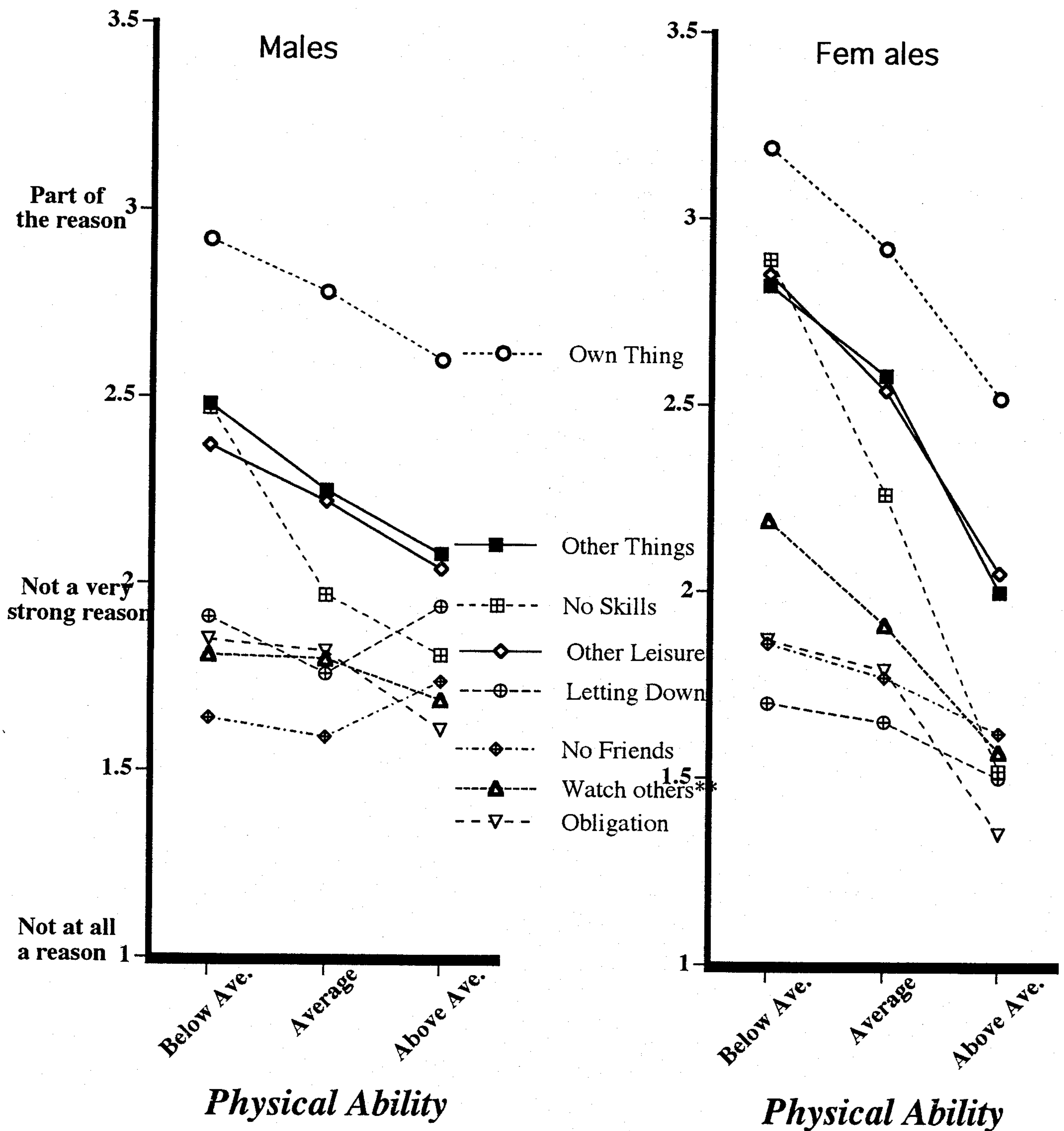
C. Reasons for Withdrawal

Only four of the ten withdrawal motive statements produced significant differences among the PA groups. These are shown in Figure 18. Needing time for other fun things was rated higher by the BA group than by the A group ($p < .005$), but only for the females. Above average male and female PA groups gave a significantly higher rating to the not competitive enough reason (males: $p < .01$; AA > A, BA; females: ($p < .05$; AA > A). Wanting to do other things with friends was more important to the BA group ($p <$

.05), and others quitting the sport was a more important motive for withdrawal for the highest PA group than for the lowest.



Figs.14. and 15. Average motive strengths for activity participation rated by male and female perceived physical ability groups.



Figs.16. and 17. Average motive strengths for activity non participation rated by male and female perceived physical ability groups.

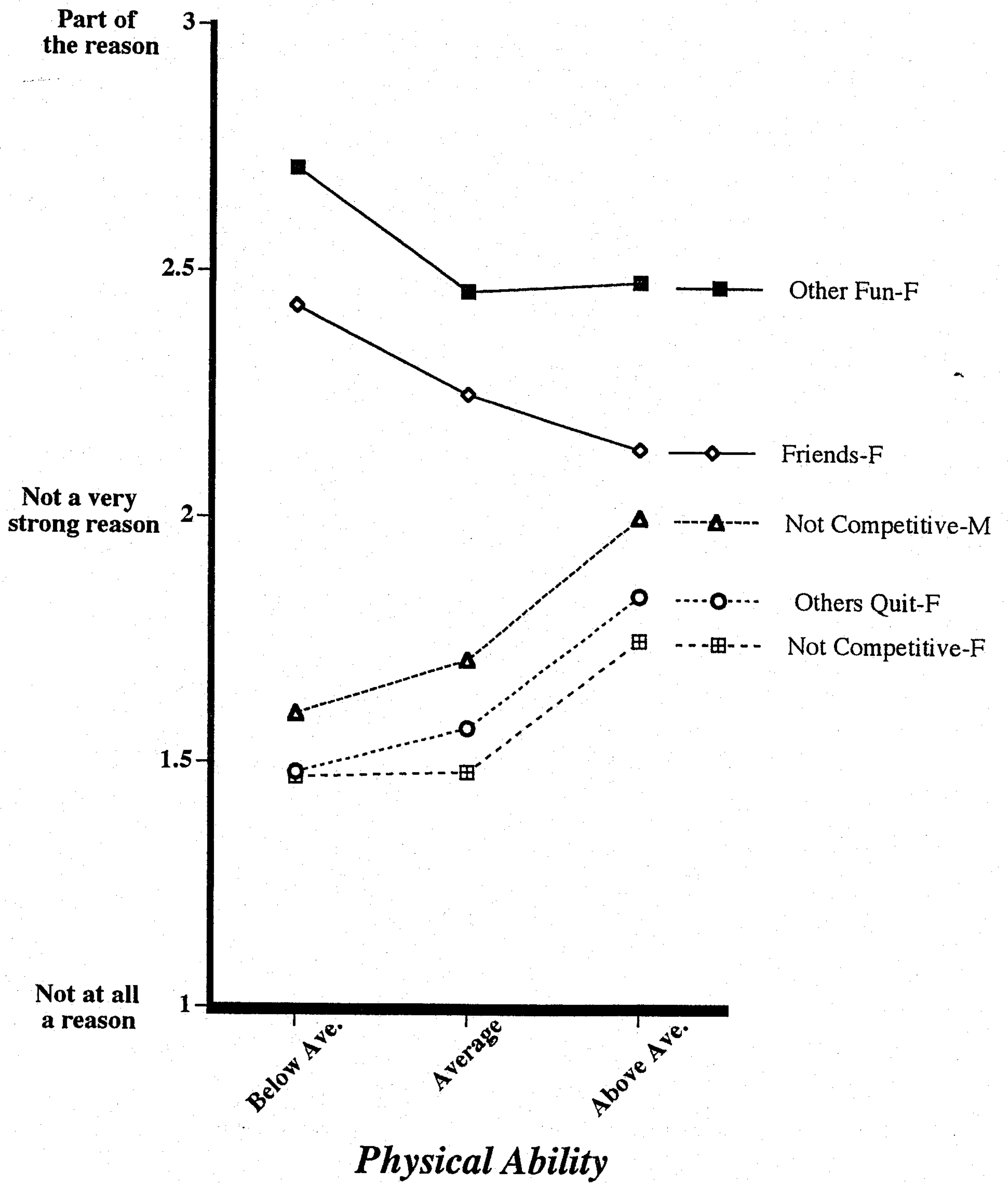
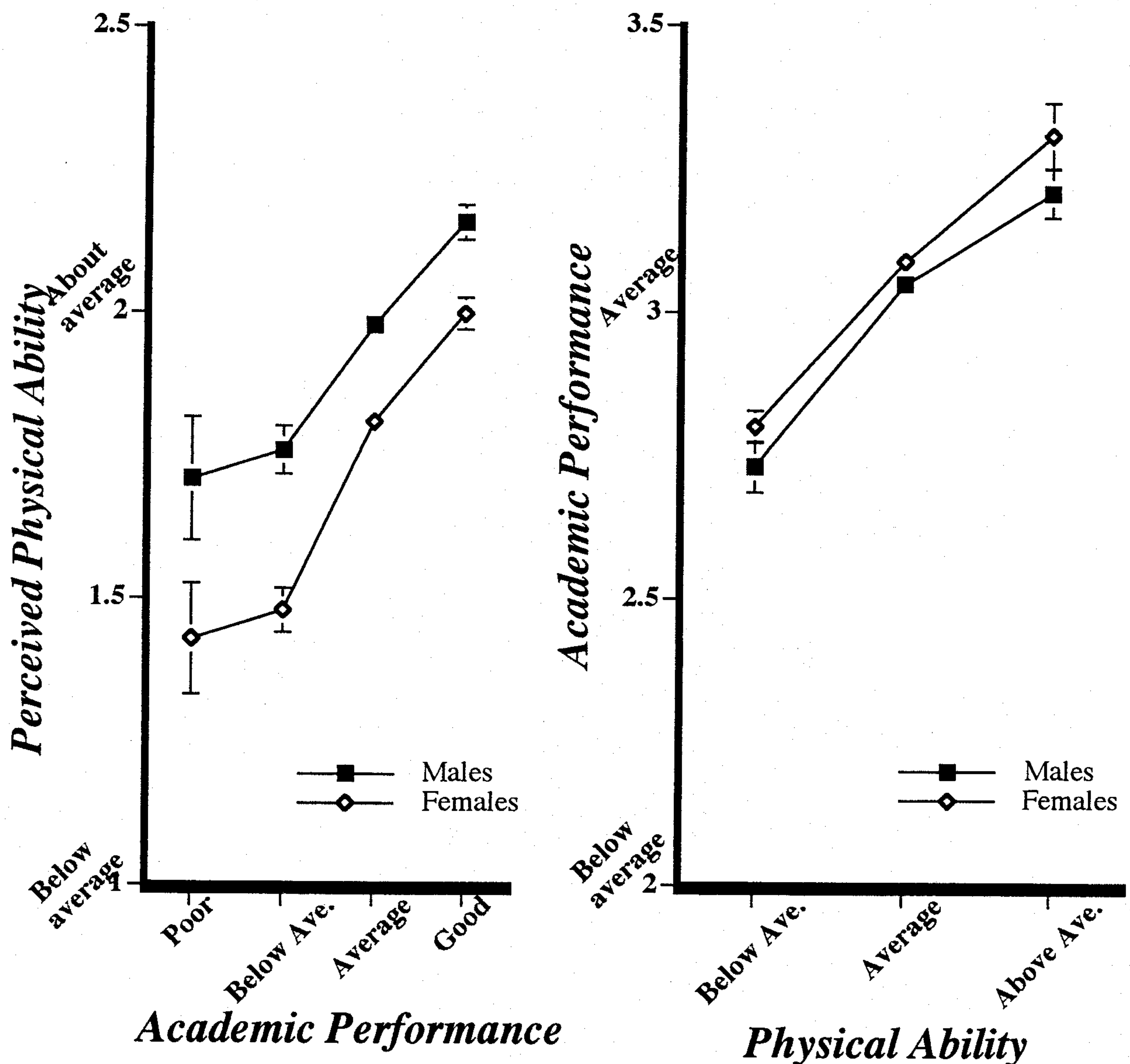


Fig.18. Average motive strengths for withdrawal from a sport rated by perceived physical ability groups

9. Academic Performance and Perceived Physical Ability

The results of the ANOVAs comparing academic performance groups with regards to perceived ability, and perceived ability groups on self-ratings of academic performance suggested a strong link between these two variables (Figures 19 and 20). The academic performance groups differed highly significantly ($F[3, 4140] = 81.12, p < .0001$) and in both the male and the female analyses all group differed significantly from each other ($p < .0001$), except the "poor" and "below average" groups.

The three perceived ability groups also had a significant main effect on academic performance ($F[3, 4142] = 114.42, p < .0001$) and all groups within the sexes differed significantly with all other groups at the .001 level or less.



Figs. 19 and 20. *Perceived physical ability of academic performance groups (left) and academic performance of physical ability groups (right)*

10. Correlations between Academic Performance, Perceived Physical Ability, and Participation Variables

The above results show strongly that good academic performers as a group have significantly higher perceived physical ability and that those with high perceived physical ability have significantly better academic performance. The Pearson Product-Moment correlation coefficients between these variables were rather modest, however, indicating a large variability in the sample. As seen in Table 8, the relationships are highly significant, but not strong. There is a consistency in the strength of the relationships between the sexes (Table 9) and across age groups with exception of the oldest age group (Table 10).

The coefficients of correlation for the relationship between academic performance and participation frequency or index were low to very low. Significant correlation was only found between academic performance and participation frequency in the whole sample, for the females and in the two youngest age groups. Total participation index correlated significantly, but lowly, with academic performance for the females as a group and for the 11-12 year age group.

Table 8

Coefficients of correlation among variables of participation and perceived characteristics for the whole sample

	Academic Performance		Perceived Ability	
Academic Performance	---			
Perceived Ability	.23**	---		
Perceived Fitness	.22**	.63**	---	
Participation Frequency	.10**	.27**	.25**	---
Participation Index	.06 <i>ns</i>	.26**	.24**	.50**

** = significant at $p < .01$

ns = not significant

Table 9

Coefficients of correlation among variables of participation and perceived characteristics for the males and the females

	Females (n = 2253)				
	Academic Performance	Perceived Ability	Perceived Fitness	Participation Frequency	Participation Index
Academic Performance	---	.25**	.20**	.16**	.09**
Perceived Ability	.21**	---	.64**	.29**	.25**
Perceived Fitness	.23**	.60**	---	.27**	.24**
Participation Frequency	.05 <i>ns</i>	.43**	.18**	---	.48**
Participation Index	.04 <i>ns</i>	.21**	.18**	.43**	---
	Males (n = 1884)				

** = significant at $p < .01$ *ns* = not significant

Table 10

Coefficients of correlation of variables of participation and perceived abilities with academic performance for the five age groups

	Perceived Academic Performance				
	7-10 n = 774	11-12 n = 921	13-14 n = 1057	15-16 n = 900	17-20 n = 463
Perceived Ability	.21**	.24**	.24**	.20**	.09 <i>ns</i>
Perceived Fitness	.22**	.26**	.21**	.19**	.08 <i>ns</i>
Participation Frequency	.11 **	.13**	.06 <i>ns</i>	.04 <i>ns</i>	.06 <i>ns</i>
Participation Index	.04 <i>ns</i>	.12**	.01 <i>ns</i>	.03 <i>ns</i>	.02 <i>ns</i>

** = significant at $p < .01$ *ns* = not significant

Discussion and Conclusions

The results of the statistical analyses indicate clearly that sport and exercise participation cannot in general be considered a detriment to academic performance as is a common belief with Hong Kong parents, teachers and even school children. The data showed that the better academic performers were the students who were on average more physically active and had more frequent and intense involvement in sport and exercise. This tendency was stronger for the females and the lower age groups (7-10 years and 11-12 years), but was evident in the entire sample.

The literature on the question of a link between sport involvement and academic performance has largely focused on the high school and college athletes in North America who participate in inter school competition. The results of studies on the effect of such participation on academic results have been equivocal. Typically, grade point averages and graduation rates of athletes have been compared with those of non athletes, and the findings suggest that high school athletes perform equally well or better than non athletes on these measures of academic performance (Coakley, 1997; McPerson, Curtis & Loy, 1989), but different results have been obtained across races, social classes and genders. In colleges and universities, the results cannot be as conveniently generalised as for high school athletes. Academic results of college athletes appear quite different for sports programmes with different philosophies, such as "big-time" programmes, i.e., intercollegiate sports programmes that are considered revenue-producing which have participants with often dreadful academic performance (Wheeler, 1996; Eitzen, 1986; Adler & Adler, 1985), while institutions that view sport programmes as part of the education process (and thus maintain strict eligibility rules and academic standards) often have an athlete population that has equal or better results than the general student population (Leonard, 1993; McPerson et al., 1989). (However, this research has been criticised for the many methodological and design problems that cast doubt on the validity of the findings (Luschen & Sage, 1981; McPherson et al., 1989; Stevenson, 1975). The current study is unique in that it has focused on a general student population to address the question whether there is an association between sport participation and academic performance. The general finding that such link seems to be a positive one for this target population is important because it may improve the image that sport and exercise participation has in the Hong Kong community and possibly in wider populations.

There is also evidence in the data of the current study, however, that very frequent and intense involvement in sport and exercise is associated with unsatisfactory academic performance. Figure 4 revealed that 13-14 and 15-16 year old who participated often had

lower academic performance than those who participated regularly. Further analyses of these data showed that females in the higher age groups who participated "almost daily" had much lower average academic self-ratings. It appears then that there is a curvilinear relationship between frequency of sport participation and academic performance for at least the older groups, in which regular exercise is associated with relatively good academic performance while lack of activity or very frequent and intense participation shows lower academic performance. This was confirmed when polynomial regressions were calculated and curvilinear relationships were found, significant in the 15-16 year group. Further evidence is seen in Figure 6 where the 17-20 year olds who rated themselves as "poor" in academic performance had the highest participation index average.

The low Pearson Product-Moment correlations between perceived academic performance and sport participation variables (Tables 6-10) are explained by the fact that the relationships are not "reversible", i.e., better academic students were the more frequent participants, but frequent participants were not necessarily the better students. When attempting to understand these findings it should be emphasised that they do not imply a causal relationship. There is no evidence in these data that regular exercise causes good academic performance or that lack of exercise or excessive participation causes poor school results. The data merely uncovered differences between participation frequency groups for their perceived academic results, and between academic performance groups for their sport and exercise participation. The explanation is speculative: perhaps the good students are the energetic children and youth who participate enthusiastically and succeed in most things they do, but alternatively the regular activity provides them perhaps with the energy and stamina to do well in most things they are doing. Clearly, however, there is no argument in these data in favour of the notion that permitting school children to participate in sport and exercise will affect their scholarly results in a negative manner.

The question that remains unanswered is why more frequent participants in physical activity generally would have better academic performance. Such positive relationship has been hypothesised for many decades in the sport sociology literature, but explanations have varied widely. The basic disagreement is whether sport participation has a causal effect or whether the phenomenon should be viewed as a "selection" matter. The former position holds that sport instils valuable attributes that are transferred to other aspects of life including studying. According to this view, commitment, perseverance, achievement orientation, discipline, self-efficacy, competence feelings, aspiration, physical and mental fitness, etc. are believed to facilitate the sport participants' academic work and give them an advantage over non participants (McPerson et al., 1989; Eitzen, 1987). The selection view on the other hand posits that sport and activity participation attracts especially people with high self-confidence, favourable attitudes, and perhaps above av-

erage cognitive abilities (Coakley, 1997). Longitudinal studies that have attempted to measure changes brought about by competitive school sport involvement appear to support the selection view: athletes were found to be already different as a group from non athletes before they entered the high school or college sport scene (the Selection factor), and those with lower abilities, less favourable attitudes and less self-esteem tended to drop out (the Filtering factor). No strong effects that could be attributed to sport participation have been found in these studies (Spreitzer, 1992, cited by Coakley, 1997). However, the above studies have been specifically on high school and college competitive athletes, and therefore do not rule out the possibility that favourable attributes and attitudes are developed through regular sport and exercise participation in primary and secondary schools.

The correlations found between perceived physical ability and physical fitness on the one hand and participation variables and academic performance on the other were consistently significant and more substantial in magnitude, with the exception of the relationship with academic performance in the 17-20 year groups (Tables 8-10). There was a clear trend for students with high perceived ability to (a) participate more frequently and intensely, and (b) to do better academically. A strong relationship between perceived ability and frequency of sport participation has also been found in a series of surveys of freshmen university students in Hong Kong (e.g., Lindner & Speak, 1995a, 1995b). It is not justified to interpret this finding as support for the above "selection" explanation, however, even though the stronger correlations may tempt one to do so. There is insufficient evidence to conclude - and the present study was not designed to attempt this - whether selection or causality is at the root of the associations. In fact, there may well be other factors that play a role here. One likely contributing factor is an "interference" one: parents may well allow students with good academic performance to participate in sport, but forbid sport involvement to poor students!

The curvilinear nature of the relationship between academic performance and sport participation is also recognisable in the reasons for participation, non participation and withdrawal (Figures 7-9). Academically "poor" and "good" male students rated the friends reason relatively low, and the "good" students the competence reason significantly higher. Among the females, "poor" and "good" students rated wanting to become good, being good at it, friends, praise and fun higher than the "below average" and "average" groups did. In the non-participation reasons u-shaped curves were observed for wanting to do one's own thing and for no skills, while for withdrawal reasons such pattern was evident for other fun things, friends, and no opportunity to co-operate. For the relationship between physical ability and sport participation such patterns were generally not present, except for the letting down and no friends non participation reasons (Figures

14-18). These results suggest that for some participation variables the "poor" and "good" academic respondents had similar characteristics compared to the "average" and "below average" groups, and the very frequent participants among the "poor" students may have heavily influenced the strengths of these ratings.

Conclusions

The results of this survey study appear to warrant the following conclusions:

1. Participation in sport and exercise was associated with academic performance in that good students tended to exercise or play in sport on a regular or frequent basis (several times per week).
2. Students who did not or rarely participate in sport and exercise perceived themselves as being the poorer academic performers.
3. Some students, particularly in the older age groups, who participated very frequently in sport and exercise (nearly daily) had lower academic performance self-ratings.
4. The differences between perceived physical ability groups for academic performance were larger than those between participation frequency or intensity groups for academic performance.
5. Low correlations were found for the associations between academic performance and frequency or intensity of participation. This was ascribed to the presence of a curvilinear function in the data and the large variability within the groups.
6. The correlations of perceived ability/fitness with academic performance, as well as with participation variables were low to modest, but significant and consistent.
7. There were significant differences in the strength of the various reasons for participation, non participation and withdrawal among the four academic performance groups. In a number of variables these assumed a u-shaped curve in which "poor" and "good" academic respondents were different from "average" and "below average" students.
8. There was no evidence in the data that lend support to the notion that sport participation, apart from very frequent or intense, had a detrimental effect on school performance. On the contrary, the better academic students tended to participate more frequently than the poorer students.

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APPENDIX A

List of Co-operating Schools

PRIMARY SCHOOLS

Name of School	Principal	Responsible Teacher
Tsing Yi Public School	Mr. Hui Siu Lee	Mr Wong Moon Fong
SKH Wing Chun Primary School	Mr Wong Chi Kin	Mr Leung Shiu Man
Fuk Wing St Govt Primary PM School	Mrs Choy Lam Mok	Mr Fan Chung Ping
LKWFSL Lau Tak Yung Mem School	Mr Chung Kwong Kei	Mr Au Hung Kong
Chan Sui Ki Primary School	Ms Yuen Kuen On	Mr. Wong
Catholic Primary School YL	Ms Lau Sing Nam	Ms Chow Yuen Fan
FMB Chun Lei School AM	Mr Lau Ying Kit	Mr Lam
SKH Yuen Chen Maun Chen School	Mr Law Tak Yee	Mr Kwong Fa Chow
Shatin Tsung Tsin School	Mr Tse Sun Fong	Mr Wong
Ma On Shan Ling Liang Primary Sch.	Mr Wong Kwok K.	Mr Chan Kin Chor
Bok Man School	Mr Lai Kwok On	Mr Wong/Miss Leung
GCEPSA Tseung Kwan O Primary Sch.	Mr Pun Tin Chi	Ms. Kwok Oi Ling
Lee Chi Tat Memorial School	Mr Hui Shun Ngai	Mr Cheung Yuk Lun
CCC Mong Wong Far Yok Mem School	Ms Ho Wing Man	Miss Tam Oi Yuk
Carmel Leung Sing Tak School AM	Ms Yau Shui Ho	Mr Cheung Yuk Ming

SECONDARY SCHOOLS

Name of School	Principal	Responsible Teacher
Leung Shek Gee School	Mr Yuk Wai Yuen	Ms Ko Lai Shan, Lisa
AD & FD Poh Leung Sing Tak School	Mr Lo Kwok Ming	Miss Siu
SKH Chan Young Sec School	Mr Tang Hing Ling	Miss Cheung Yue F.
Cotton Spinners Assn Prevocational Sch.	Mr Wan Hing Yuen	Mr. Chan
Mong Man Wai College	Mr Ip Shun Tak	Mr Kwong Wing C.
PLK Tang Yuk Tien College	Mrs Yau Ho Oi King	Mr Law Wing Fai
HK Red Swastika Soc Tai Po School	Ms Poon Kam Yee	Miss Chan Wai Yee
FDBWA Szeto Ho Sec School	Mr Law Yu Chi	Mr Tseung Tak Yiu
Bud Chi Hong Chi Lam Mem School	Mr Chau Hin Cheong	Mr Siu Siu Pui
St Paul's Convent School	Sr Wong Kam Lin	Mrs Y. Fung
Wa Ying College	Mr Mak Chiu	Mr. Wan Kam Suk
New Asia Middle School	Ms Lau Woon Ying	Mr Wong Wa Tsim
Kei Long College	Ms Chan Kit Ching	Mr Lai Hung
HKTA Ching Chung Sec School	Mr Hong Yit Kiu	Mr Lam Wei Keung
Carmel Alison Lam Found Sec School	Mr Tang Siu Hin	Mrs But/Mr Law