

YOUTH SPORTS PARTICIPATION, TRAINABILITY AND READINESS

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CHAPTER 4: MOTIVATION FOR SPORT IN PORTUGUESE YOUTH - biological and social dimensions

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INTRODUCTION

Participation in sport is a common feature in the lives of children and adolescents throughout the world. The form of participation, however, varies from informal sport activities (e.g., a game of football (soccer) among neighborhood boys) to recreational sport (e.g., basketball or volleyball at a recreational center) to organized sport (e.g., regular practice and competition with a formal team or club). Organized sport implies the presence of a coach, and regular practices and competitions during the course of a season. The structure of sport programs for children and adolescents varies among countries (De Knop *et al.*, 1996) and sport opportunities vary with cultural context. An issue of central importance for those who directly work with youth sport programs is understanding why children and youth participate in sports.

Initial insights about the motivations of children and adolescents for participating in sport are based largely on data for North America (Gill *et al.*, 1983; Gould *et al.*, 1985; Ewing and Seefeldt, 1988). Recent information for urban Mexican youth 9-18 years is provided by Siegel *et al.* (this volume).

Corresponding data on motivations for sport among Portuguese children and adolescents also emerged in the 1980s. For example, the Portuguese version of the *Participation Motivation Questionnaire* was adapted by Serpa and Frias (1990) and published by Serpa (1992) as QMAD. It was preceded by another Portuguese version from Cruz and Cunha (1990) which was mainly used by Cruz and psychological researchers from University of Minho (Cruz and Costa, 1988; Cruz *et al.*, 1988; Cruz and Viana, 1989). The QMAD was used in Lisbon (Costa, 1992; Varela-Silva, 1993), Oporto (Serpa, 1992; Fonseca and Fontainhas, 1993; Costa, 1991; Fonseca and Ribeiro, 1994), Vila Real (Vasconcelos Raposo and Figueiredo, 1997; Vasconcelos Raposo *et al.*, 1996), and Azores (Ávila and Vasconcelos Raposo, 1999).

Information regarding features of sport participation in the Portuguese Midlands is lacking. The present study considers sport participation and motivation for participating in sport among secondary school students of the district of Coimbra. Sport participation status is initially described and then motivation for participation in sport is considered in several contexts:

- The factor structure of motivation for sport;
- Sex differences in motivation for sport;
- Potential association of somatic variables and social stimuli for sport with motives for participation in sports.

METHODS

Motives for participation in sport were surveyed as part of a more detailed study of growth status, physical fitness and lifestyle of adolescents in the Coimbra region of Portugal (Coelho e Silva *et al.*, 2003). A sample of 797 high school students (387 males and 410 females), 15.5 to 18.4 years of age was surveyed. The students were enrolled in 15 schools of 10 different municipal districts.

Motivation for sport was assessed with the 30-item questionnaire of Gill *et al.* (1983). The questionnaire was designed to include possible reasons for participating in organized sports programs. The Portuguese version developed by Serpa (1990) was adopted for the present study. Respondents were asked to rate the importance of each item on a five point Likert scale (1=not at all important, 3=somewhat important, 5=very important).

Somatic variables included body weight, height, sitting height/stature ratio, index of androgyny, and sum of skinfolds (log transformed). The measurement protocol described by Lohman *et al.* (1988) was used. All subjects were observed by the same anthropometrist. Technical errors of measurement are reported in (Coelho e Silva *et al.*, 2003).

Social incentives for sport included spatial stimulus, material play stimulus and social participation. This inventory was developed by Renson and Vanreusel (1990) and adapted by Sobral (1992). It included settings and opportunities for informal activities and more formal participation in sports.

Exploratory factor analysis of the motivation for sport questionnaire was carried out to identify combinations of items that best explained the variance in the sample. Gender differences were with the t-test. MANOVA was used to test the effect of sport participation status on extracted factors within each sex. This technique is a multivariate extension of univariate analysis of variance,

and inquires if there are significant differences among groups for a linear combination of measured dependent variables, combined so as to separate the groups as much as possible. Multivariate analysis was followed by ANOVA and the Bonferroni adjustment for multiple comparisons.

Canonical correlation analysis was performed to analyse the relationships between sets of variables. It is a bivariate correlation between two composite scores (one for each of the two variable sets). The easiest way to understand canonical correlation is to think of multiple regression. In regression, there are several variables on one side of the equation and a single variable on the other side. The technique identifies the components of one set of variable that are most highly related (linearly) to the components of the other set of variables. The variables are combined to maximize the relationship between the two variable sets. This maximization is performed by weighting initial scores in each variable set. The weights can be either negative or positive and are simply multiplied times the scores for each subject. These weights are called canonical variates and are the same as beta in a regression analysis. Canonical correlation analysis creates linear combinations between sets of variables. Although mathematically viable, linear functions are not necessarily interpretable. Thus, a major challenge using the technique is to discern, if possible, the meaning of pairs of canonical variates. According to Tabachnick and Fidell (1996), the number of statistically significant pairs of canonical variates is often larger than the number of interpretable pairs, especially if the sample is large.

Statistical significance was set as $p < 0.05$. The statistical analysis was performed using the *Statistical Package for the Social Sciences* (SPSS inc., version 10.0, Chicago, Illinois).

RESULTS

a) Sport participation

Among boys, 31% indicated no history of participation in organized sport, while 31% were formally involved in organized sport but not involved at the time of the survey, and 38% were currently involved in organized sport. Corresponding data for girls indicated a major sex difference. The majority of girls, 57% indicated no history of participation in organized sport and 34% were formally involved in organized sport. Only 9% of the girls were actively involved in organized sport at the time of the survey.

Football (soccer) followed by basketball was the most popular team sport in both sexes, whereas swimming was the most popular individual sport in both sexes.

b) Motives for participating in sports

Results of the factor analysis of the motivation for sport questionnaire in the total sample are summarized in Table I. Six factors were extracted (eigenvalue >1.0), explaining 53% of the variance. They can be characterized as follows: F1: *Achievement Status (AS)*, F2: *Sport Goals (SG)*, F3: *Team Orientation (TO)*, F4: *Exertion (EX)*, F5: *Fun (F)*, and F6: *Social Influence (SI)*.

Table I. Factor analysis on motives for participating in sports. Communalities and loadings on extracted factors after varimax rotation (N=797).

	Communalities	F1	F2	F3	F4	F5	F6
1. I want to improve my skills	.47	.06	.60	.32	.05	-.06	-.02
2. I want to be with my friends	.62	.10	-.09	.34	.04	.69	.07
3. I like to win	.51	.65	.28	-.01	.03	.00	-.06
4. I want to get rid of energy	.63	.08	.17	.14	.76	-.02	.01
5. I like to travel	.45	.32	-.15	-.06	.37	.41	.13
6. I want to stay in shape	.51	.01	.66	.00	.22	.17	-.02
7. I like the excitement	.44	.32	.12	.18	.50	.18	.04
8. I like the teamwork	.60	-.03	.18	.72	.16	.14	.04
9. My parents or close friends want me to participate	.46	.25	-.11	.38	.11	.20	.43
10. I want to learn new skills	.48	.08	.42	.53	.12	.08	.07
11. I like to meet new friends	.64	.03	.03	.39	.20	.66	.04
12. I like to do something I'm good at	.39	.32	.29	.07	.35	.26	.10
13. I want to release tension	.58	-.08	.28	.09	.67	.05	.17
14. I like the rewards	.58	.73	.11	-.04	.12	.11	.04
15. I like to get exercise	.52	-.18	.61	.08	.27	.05	.20
16. I like to have something to do	.58	.11	-.01	-.08	.32	.15	.66
17. I like the action	.47	.08	.27	.09	.34	.12	.50
18. I like the team spirit	.62	-.09	.26	.71	.10	.12	.15
19. I like to get out of house	.43	.46	-.23	-.13	.17	.25	.24
20. I like to compete	.50	.42	.47	.24	-.09	-.03	.18
21. I like to feel important	.58	.73	-.11	.07	.10	-.01	.13
22. I like being on a team	.34	.20	.16	.34	-.05	.33	.22
23. I want to go to a higher level	.57	.33	.64	.19	.00	.02	.12
24. I want to be physically fit	.58	-.09	.73	.12	.14	.02	.06
25. I want to be popular	.60	.75	.04	.02	.02	.06	.18
26. I like the challenge	.37	.17	.38	.31	.19	.00	.25
27. I like the coaches	.61	.38	.15	.33	-.09	-.06	.57
28. I want to gain status or recognition	.64	.77	.03	.10	-.02	.01	.18
29. I like to have fun	.67	-.05	.29	-.12	.00	.73	.18
30. I like to use the equipment or facilities	.42	.17	.20	.17	-.09	.14	.55
Eigenvalues		3.86	3.39	2.41	2.12	2.09	1.97
% of variance	52.8	12.9	11.3	8.0	7.1	7.0	6.6

Two items loaded on more than one factor, item 20 ("I like to compete") and item 10 ("I want to learn new skills"). Loadings of both items were >0.40, which is the commonly accepted cut-off value for inclusion of an item in the

interpretation of a factor. Given the nature of the context implied in each, item 20 was included in F1 (Achievement Status), while item 10 was included in F2 (Sport Goals). On the other hand, three items of the motivation for sport questionnaire did not meet the criterion for inclusion on any of the six factors: item 12 (0.39), "I like to do something I am good at"; item 22 (0.34), "I like being on a team"; and item 26 (0.37), "I like the challenge."

c) Sex differences in motives for participating in sports

Arithmetic means of items which entered on each factor were used to derive overall scores on the respective dimensions of motivation for boys and girls. Results are summarized in Table 2. Boys have, on average, higher scores on three of the factors: F1, Achievement Status ($p < 0.01$); F2, Sport Goals ($p < 0.01$); and F6, Social Influence ($p < 0.05$). Girls have, on average, a higher score on F5, Fun ($p < 0.01$). Mean scores for F3, Team Orientation, and F4, Exertion, do not differ between boys and girls. The top 10 (highest item mean scores) reasons for participating in sport for boys and girls are given in Table 3. Three of the top five items in boys comprise F2 (Sport Goals), while three of the top five items in girls comprise F5 (Fun).

Table 2. Comparisons of means between males and females on participation motivation factors.

Factor	Males (n=387)	Females (n=410)	t	p
Achievement status (AS)	2.53 ± 0.77	2.21 ± 0.69	6.18**	.00
Sport goals (SG)	3.98 ± 0.69	3.70 ± 0.65	1.51**	.00
Team orientation (TO)	3.93 ± 0.88	3.85 ± 0.90	0.35	.19
Exertion (Ex)	3.27 ± 0.84	3.21 ± 0.76	4.84	.31
Fun (F)	3.61 ± 0.67	3.77 ± 0.74	5.56**	.00
Social influence (SI)	3.10 ± 0.71	2.98 ± 0.73	0.25*	.02

** ($p < 0.01$), * ($p < 0.05$)

Table 3. Top 10 reasons for participating in sports in males and females.

Boys (N=387)		Girls (N=410)	
24	I want to be physically fit	29	I like to have fun
29	I like to have fun	11	I like to meet new friends
6	I want to stay in shape	24	I want to be physically fit
15	I like to get exercise	2	I want to be with my friends
18	I like the team spirit	18	I like the team spirit
1	I want to improve my skills	15	I like to get exercise
8	I like the teamwork	6	I want to stay in shape
11	I like to meet new friends	8	I like the team work
23	I want to go to a higher level	12	I like to do something I'm good at
2	I want to be with my friends	1	I want to improve my skills

d) Canonical correlations: somatic variables and motives

The relationship between somatic variables and motives for participating in sports is significant for the first canonical correlate in boys [$r_{c1}=0.32$, $p<0.01$, extracted variance 6% and 36% for somatic and motivation variables, respectively]. Among girls, there are two significant canonical correlations [$r_{c1}=0.30$, $p<0.01$, extracted variance 9% and 12%; $r_{c2}=0.24$, $p<0.05$, extracted variance is 8% and 27%].

Among boys, the first pair of variates accounts for 61% of the overlapping variance between the two sets of variables. Boys having high levels of adiposity (0.49) are less motivated to exercise (see Figure 1). This lack of interest is especially evident in factors interpreted as social influence (-0.79), sport goals (-0.74), exertion (-0.64), achievement status (-0.53) and fun (-0.44).

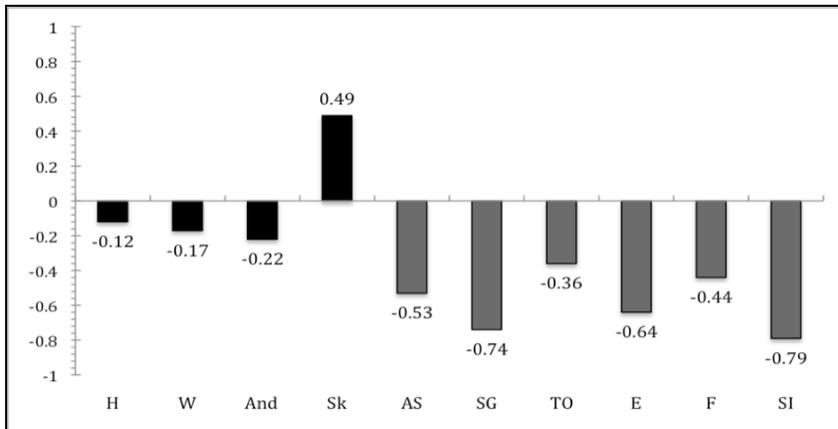


Figure 1. Correlations between somatic variables and motives for participating with the first pair of variates in males. **Legend:** [H] height; [W] weight; [And] Index of androgyny; [SK] sum of skinfolds; [AS] achievement status; [SG] sport goals; [TO] team orientation; [E] exertion; [F] fun; [SI] social influence.

Among girls, the canonical correlations explained 45% of the overlapping variance between domains. The canonical correlate presented in Figure 2 suggests that fatter girls are less motivated to participate in sports. Somatic variables load are positively correlated (sum of skinfolds, +0.72; body weight, +0.47) and motivation variables are negatively correlated (sport goals, -0.79; achievement status, -0.68; exertion, -0.59; social influence, -0.40) on the second variate.

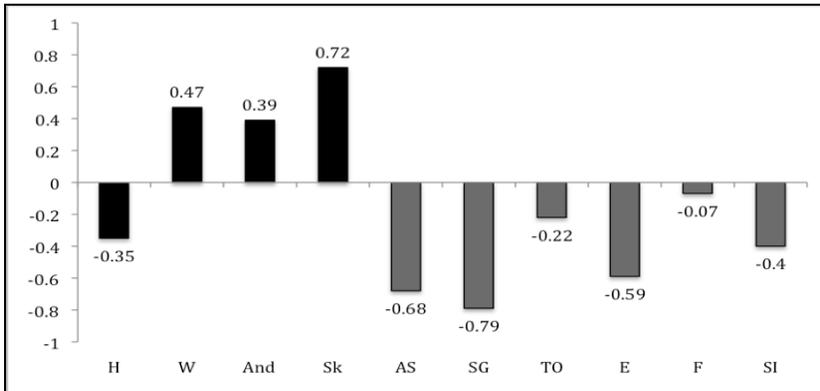


Figure 2. Correlations between somatic variables and motives for participating with the second pair of variates in females. **Legend:** [H] height; [W] weight; [And] Index of androgyny; [SK] sum of skinfolds; [AS] achievement status; [SG] sport goals; [TO] team orientation; [E] exertion; [F] fun; [SI] social influence.

e) *Canonical correlations: motives and social stimulus*

The canonical analysis of motives for participation in sport and social stimulus resulted in one significant canonical correlation for both boys [$r_{c1}=0.20$, $p<0.05$, extracted variance 26% for motives and 41% for social stimulus] and girls [$r_{c1}=0.20$, $p<0.05$, extracted variance 28% for motives and 33% for social stimulus], respectively. The first pair of variates accounts for 63% and 74% of the overlapping variance for males and females, respectively.

Among boys, social influence (+0.75) and material stimulus (+0.93) have the highest correlations with their variates (Figure 4). Therefore, boys receiving higher social incentives have a more positive attitude towards participation in sports.

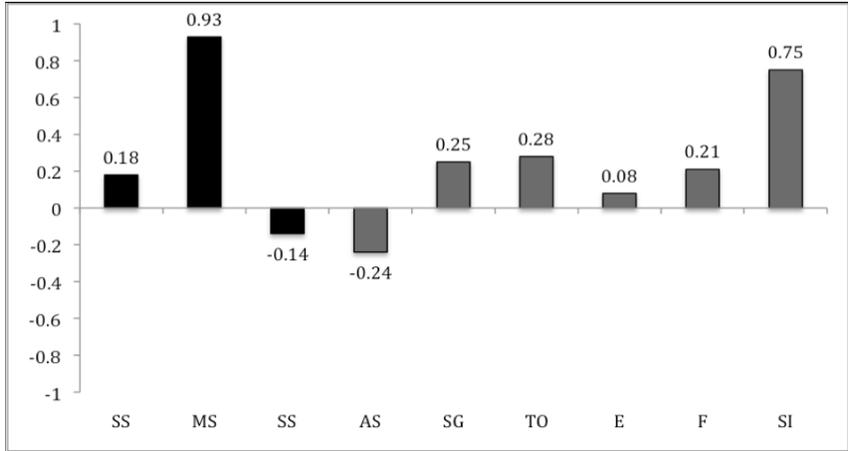


Figure 3. Correlations between motives for participating and social stimulus with respective variates in males. **Legend:** [SS] social stimulus; [MS] material stimulus; [SS] spacial stimulus; [AS] achievement status; [SG] sport goals; [TO] team orientation; [E] exertion; [F] fun; [SI] social influence.

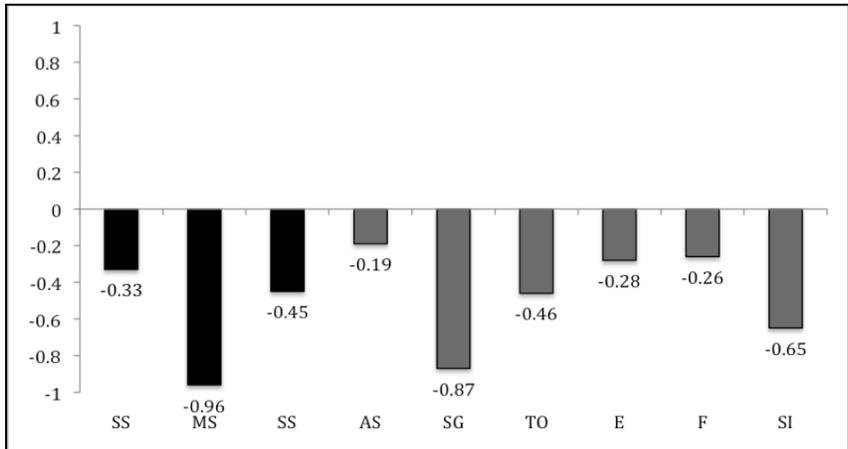


Figure 4. Correlations between motives for participating and social stimulus with respective variates in females. **Legend:** [SS] social stimulus; [MS] material stimulus; [SS] spacial stimulus; [AS] achievement status; [SG] sport goals; [TO] team orientation; [E] exertion; [F] fun; [SI] social influence.

For girls, the canonical correlation expresses a direct association between lack of social incentives and motivation for participating (Figure 4). Girls having less incentives such as material stimulus (-0.96) and social participation (-0.45) show a poorer attitude towards sport participation, especially evident in the

factors interpreted as sport goals (-0.87), social influence (-0.65) and team orientation (-0.46).

DISCUSSION AND CONCLUSIONS

Results of factor analysis of the 30 items of the motivation for sport questionnaire in the present sample of adolescents 15-18 years of age compare favorably with similar analyses of the responses of sports school participants 8-18 years in Iowa (Gill *et al.*, 1983), age group swimmers in Michigan (Gould *et al.*, 1985), and school children 10-15 years in Oporto (Serpa, 1992). In all studies, data for combined samples of males and females were analyzed in a similar statistical manner.

The factors extracted in each study are summarized in Table 4. With several exceptions, the extracted factors in each study are similar, although the present study obtained fewer components than the other studies. All extracted factors in the present study had Cronbach alpha coefficients >0.60 . In the study of Oporto youth (Serpa, 1992), the factor labeled "Influence of family and friends" had an acceptable loading of only one item, while the dimensions labeled "Physical Fitness" and "Skill Development" had, respectively, acceptable loadings on only two items of the motivation for sport questionnaire. In the present study, F3 (Team Orientation) had acceptable loadings on only two items, whereas the other five extracted factors had acceptable loadings on three or more items of the questionnaire.

Adolescence is a period of great biological, psychological as well as social transformations. Each one of these domains should not be analyzed as a separate occurrence. Results of the canonical correlation analyses suggest that the development of motivation for participating in sports does not occur in a vacuum. Rather, relationships between social stimuli and participation motivation, and between physical characteristics (overall body size and fatness) and motives for participating in sports are indicated.

A major question of current interest, especially in public health, deals with the motivation for participating in physical activity, including sport, and/or for the discontinuation of participation among youth in general and among overweight and/or obese youth in particular. Sport is an important source of physical activity among youth so that motivations of overweight adolescents may provide some insights. For example, the motivation for participation in sports expressed by the leanest and fattest 10% (based on sum of skinfolds) of Portuguese boys suggest differences (Coelho e Silva *et al.*, 1999). The leanest boys scored significantly higher than the fattest boys in items related to winning, excitement, competition, advancement to higher levels of

competition and physical fitness. Although not statistically significant, the fattest boys scored higher than the leanest boys on three out of 30 items on the questionnaire: "I want to get ride of energy", "I like the teamwork" and "I like being on a team".

Table 4. Summary of factors extracted from the 30-reason questionnaire of Gill *et al.* (1983) in different studies.

Study	Sample	Context	Factors	α -Cronbach
Gill <i>et al.</i> (1983)	n=1138 male, female 8-18 years	1979 Iowa Summer School	Achievement/status	.76
			Team	.78
			Fitness	.75
			Energy release	.65
			Situational factors	.49
			Skill development	.44
			Friendship	.30
			Fun	.55
Gould <i>et al.</i> (1985)	n=365 male, female 8-19 years	Michigan, Swimmers	Achievement/status	
			Team atmosphere	
			Excitement/challenge	
			Fitness	
			Energy release	
			Skill development	
			Friendship	
Serpa (1992)	n=175 male, female 10-15 years	Oporto	Achievement/status	.68
			Fun	.65
			Team orientation	.68
			Situational factors	.66
			Physical fitness	.61
			Skill development	.24
			Influence of family and friends	
Ávila And Vasconcelos Raposo (1999)	n=198 male, female 12-18 years	Azores	Sport affiliation	.83
			Status	.76
			Situational determinants	.65
			Emotional release	.67
			Achievement	.70
			Friendship	.48
Fonseca and Maia (2000)	n=1816 male, female 10-18 years	North, Portugal	Technical competence	
			Physical fitness	
			General affiliation	
			Competition	
		Handball, Track and, field, basketball, soccer gymnastics, swimming, Volleyball	Team affiliation	
			Fun	
			Excitement	
			Status	
Present Study	797 male, female 15-18 years	Coimbra	Achievement/status	.81
			Sport goals	.78
			Team orientation	.70
			Exertion	.62
			Fun	.65
			Social influence	.66

In a similar study of urban Mexican youth, the motivation for sport and for discontinuing sports was compared in youth 14-18 years of age classified as normal weight (BMI >15th and <85th percentiles) and overweight (BMI ≥85th percentile). The highest ranking motivations for participating in sport for normal weight boys and girls were having fun (1st), physical fitness (2nd), exercise (3rd boys, 4th girls), and getting rid of energy (4th boys, 3rd girls). Among overweight boys and girls, the order varied: physical fitness (1st), fun (2nd boys, 4th girls), exercise (3rd boys, 2nd girls) and to learn new skills (4th boys, 3rd girls). A subsample of boys and girls were also asked to rate the importance of reasons for stopping sport participation. The top three reasons for discontinuing participation in sport among overweight youth were the following: coach was a poor teacher (1st), too much emphasis on winning (2nd) and sport was no longer fun (3rd). Although differences between the fattest and leanest boys and between overweight and normal weight boys and girls are generally small, the trends suggest potentially important directions for future research. They indicate a need for more detailed study of the motivation for sport and physical activity in overweight/obese children and adolescents.

Environmental factors related to physical activity and inactivity are a topic of current concern. Area of residence, availability and proximity of facilities, safety considerations, among other factors, receive most attention. More recently, emphasis has shifted to the "built environment." The relevance of the preceding for opportunities to be physically active or inactive is seemingly obvious. What is lacking in discussions is consideration of potential interactions among aspects of the built environment (spatial stimuli for activity – playgrounds, open spaces, swimming pools, gymnasias, etc.), materials for activity (material stimuli – bicycles, roller or in-line skates, balls, rackets, ropes, etc.), and social organizations for activity (social centers – sport clubs, recreation centers, folk and theater groups, church organizations, etc.). Associations between motives for participation in organized sport and components of the environment (built, material, social) were considered in the sample of Portuguese adolescents. Results of sex-specific canonical correlation analyses indicated generally similar results for males and females. Scores on the three environmental components were directly associated with levels of motivation for participating. Among females, limited material stimuli which is mainly a familial dependent variable was related with an amotivated state for participating in sports.

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