

Associations Between Sport Involvement and Youth Psychosocial Development in Sweden: A Longitudinal Study

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Abstract

There is a widespread belief that organized sport can be used as a tool for positive youth development. However, phenomena such as parental pressure, binge drinking, doping, bullying and marginalization are also present within the sport milieu, with potential risks for negative outcomes to occur. The aim of the present study was to examine the longitudinal effects of organized sport involvement on indicators of youth psychosocial development over 24 months. Surveys assessing reported sport involvement and psychosocial development indicators were carried out at baseline (T1), 12 months (T2), and 24 months (T3). The results, based on self-reports of 920 youth, ages 10-18 years from Sweden, showed strong evidence of an association between baseline sports involvement and end line self-esteem (SE) ($r=.15$; $p<.001$), perceived physical competence (PPC) ($r=.47$; $p<.001$), and social competence (PSC) ($r=.21$; $p<.001$), reported grades (GRAD) ($r=.13$; $p<.001$) and alcohol use (ALC) ($r=.10$; $p=.016$). After adjusting for selection effects (i.e. dropping out of sport) and prior level outcomes, the effects of sport involvement on indicators of youths' psychosocial development used in this study, were in general negligible ($\beta_{SE}=.05$, $p=.20$; $\beta_{PSC}=.05$, $p=.20$; $\beta_{GRAD}=.04$, $p=.60$; $\beta_{ALC}=.03$, $p=.49$) except for PPC ($\beta_{PPC}=.14$, $p<.001$). The results of this study highlight the importance of using longitudinal studies that account for variances explained by prior level outcomes, socio-demographic variables and dropouts from sports.

Background

Organized sports are highly valued in most Western societies and attract major portions of citizens in one way or another. In Sweden, nearly two-thirds of its youth are members of sports clubs, and almost 80% of their parents are voluntarily involved in the daily work of the clubs (1). This large involvement is due partly to the historically evolved and culturally embedded public notion that participating in sports contributes positively to youth psychosocial development (YPD) (2,3,4). The perception of sport as a positive vehicle for youth development is widely accepted in many cultures. However, this view has not been left unchallenged. Phenomena such as parental pressure, binge drinking, doping, anorexia, burnout, bullying and marginalization are also present within the sport milieu, introducing potential risks for negative developmental outcomes (5,6,7).

According to Bronfenbrenner (8), human development occurs through complex, reciprocal interactions (i.e., proximal processes) between an active human organism and people, objects and symbols in its immediate (micro) and more distant environment (meso, exo and macro). These interactions must occur on a regular basis over an extended period of time in order to influence human development. Long-lasting proximal processes are found in the context of organized sport, where youth continuously interact with peers and adults (e.g., coaches and parents) while learning new skills and performing complex tasks (8). This makes organized sport an arena in which great opportunities for youth development can occur.

Keywords: Children, Adolescents, Psychosocial Development, Organized Sport, Involvement

Previous studies on the effects of organized sport on youth psychosocial development have shown that youth participating in sports report significantly better characteristics on most developmental outcome when compared to non-participants (2,6). For example, sport participation is related to more happiness and well-being, lower rates of depression, higher levels of self-esteem, stronger perceived physical and social competence, and better academic performance (9,10,11,12,13,14,15). Importantly, the designs of the studies mentioned above (i.e., cross-sectional and retrospective) do not make it possible to determine whether differences between groups are caused by sport participation or whether they might be explained partially by selection processes or by differences regarding psychosocial characteristics established before beginning sport activities. Although still very sparse, there has been a growing interest in using longitudinal studies in this area to try and control for pre-existing differences and to sort out presumptive cause and effect relationships. In many cases though, the findings have been inconsistent. Some longitudinal studies support the popular belief that sport is a positive vehicle for youth development, showing that participation in organized sports can increase self-esteem and self-confidence, academic achievement and peer relations while reducing depression and social isolation (16,17,18,19). In contrast, other longitudinal studies have found no such effects using similar outcome variables (e.g., 20,21,22).

One reason for these inconsistent results might be that most of the longitudinal studies have only considered the breadth of activities (number), leaving out intensity (quantity of time in sports) and duration (cross-year continuity), which are important developmental dimensions of structured out-of-school activities (20,23,24). Moreover, to our knowledge, only one study (22) has explicitly adjusted for selection processes related to attrition from sport, suggesting that previously observed differences may be due to less developed psychosocial characteristics among individuals dropping out of sports compared to those who stay involved. This is important to take into account in order to adjust for the unique effects of sports involvement. Otherwise there will be a risk of overestimating the effects of sports participation. Clearly, more longitudinal work is needed that ensures a high response rate, taking into account several dimensions of sports involvement while controlling for selection effects.

Purpose of the current study

In order to fill the gaps in the research done in this area, the main purpose of this study was to examine the potential

effects of organized sport involvement on indicators of YPD, considering three dimensions of sport involvement (breadth, intensity and duration) while controlling for selection processes. In this study YPD was measured by self-esteem, perceived physical and social competence, prosocial behaviour, reported grades, psychosomatic health, smoking and alcohol consumption. These indicators are often subject for inquiry in most studies done in this area (see 3 and 13 for an overview).

Methods

Study Design

The study employed a longitudinal cohort design, with three rounds of surveys (T1=baseline, T2=12 months, T3=24 months) including elements of retrospective questions (i.e., reported number of sports and years of participation before the beginning of the study). Although cause and effect relationships cannot be established fully, this design facilitates the identification of factors that precede change or non-change over time. It also allows for comparisons between cohorts and makes it possible to establish the sequence of events (25). Despite deficiencies (distortions and reinterpretations when recalling), retrospective questions made it possible to obtain information about each participant's past sport participation, stretching the time-span for the analyses.

Recruitment and Sampling

Data was collected from pupils (10-18 years) residing in schools situated in the provinces of Värmland and Västra Götaland, located in the middle parts of Sweden. The sample was based on a three-step stratified sampling procedure. In the first step, schools were selected to provide equal distribution of primary, lower secondary, and upper secondary schools. Secondly, classes were chosen using simple randomization within each school level. Third, using Cohen's (26) guidelines for estimating the sample size along with former noticeable problems with longitudinal designs concerning loss of cases over time (25), we decided to include 500 pupils in each stratum. Due to school administration problems at the end of the semester the total sample comprised 1358 pupils, nearly equally distributed over primary school (n=465), lower secondary school (n=439) and upper secondary school (n=454). Informed consent was obtained from both teachers and parents, along with informed assent from study participants. Ethics approval for the study was obtained from Karlstad University Ethic Approval Committee.

The starting ages (10, 13 and 16 years) were strategically chosen to minimize the dropout rate, as pupils usually change schools at 12 and 15 years.

Participants and Procedures'

Note: 61 individuals started to participate in organized sports during the data collection, resulting in a total of 623 participants who sometimes were involved in sports at T1 to T3.

A co-director of the project administered the questionnaire during school hours at T1, T2, and T3. The participation rate was quite high (T1=85%; T2=80%; T3=80%). In order to keep the sampling criteria constant across the study, only respondents with data from all three waves were included in the primary analysis. Consequently, 920 respondents were included in the final sample.

The mean baseline age of participants was 13.78 years (±2.40 years). Approximately 59% of study participants were male and 41% were female. The main reason for the sex imbalance was because boys dominated the high school programs/classes (i.e., technical and practical) that were randomly assigned to the sample. The vast majority of participants (90%) were of Swedish background. A large part of the sample was active in one or more sports at each time of measurement, but the participation rate decreased over time (61% at T1; 59% at T2 and 52% at T3). Participants who participated in organized sport did so for an average of 5.89 (±4.78) hours per week at T1, 6.21 (±5.27) hours at T2 and 6.54 (±5.83) hours at T3. In total, participants were involved in 45 different sports, with the greatest involvement in soccer (40%), equestrian (9%), ice-hockey (6%), floor-ball (5%) and golf (5%).

Measures

Socio-demographic variables. Since earlier research has shown significant associations between indicators of YPD

and demographic variables such as sex, age, ethnicity and socioeconomic status (SES) (27,28,29,30) we decided to consider those as confounding variables when analyzing the multivariate relationship between SI and YPD.

In order to reduce the length of the questionnaire, data concerning sex (T1), age (T1), ethnicity (T2) and socioeconomic status (SES) (T2) were collected at different waves. Ethnicity was dichotomized into Swedish and non-Swedish descent.

The determination of SES was based on i) parents' occupational status (POS) and ii) the possession of certain objects (OBJ) (e.g., weekend cottage, boat with sleeping possibilities). The values of POS and OBJ were standardized and summarized for each participant, creating a SES-index (M=49.02, SD=±13.16). Sport involvement. In order to consider the dimensions of breadth (number of organized sports), intensity (hours spent per week in organized sports) and duration (total number of years spent in organized sports), a sport involvement index (SI) was calculated at each wave (SIT1- SIT3). In order to create a composite SI index, participants were given 1 point for each sport (S), 1 point for every year (Y) and 1 point for every hour per week spent in organized sport (H). The equation for SI could thus be summarized as:

$$SI = \Sigma_S + \Sigma_Y + \Sigma_H$$

Mean SI scores were 11.49 (±10.11) at T1, 16.79 (±14.87) at T2, and 21.74 (±19.74) at T3 (see Table 1). The rationale for giving such importance to the number of hours spent in sports was based on Bronfenbrenner's (5) theoretical framework, which argues that the primary mechanism for human development is the interaction between organism and environment, which must be reasonably stable and predictable over time in order to be effective.

Dropout from sports. A dropout variable was created to control for selection effects out of sports.

Table 1. Mean Total Sport Involvement Scores at each Time Point (T1-T3) and Mean Scores in each Sub-category (Sports, Years and Hours).

Variable	Sports	Years	Hours	M	SD
1. Sport involvement (T1)	2.10	6.02	3.34	11.47	10.11
2. Sport involvement (T2)	3.07	6.99	6.73	16.79	14.87
3. Sport involvement (T3)	3.96	7.88	9.90	21.74	19.74

Note. *Sports*= Number of sports reported participating in before the beginning of the study (retrospective) and sports reported participating in at each time point. *Years*= Sum of years of sports participation before the beginning of the study (retrospective) and years reported participating in sports at each time point. *Hours*= Number of hours spent in organized sports per week at each time point.

This variable refers to individuals who discontinued their involvement in organized sport and did not attend any sport again during the study (T1-T3). In total 103 participants (17% of all sports participants at T1-T3) reported dropping out of organized sports.

Self-perceptions. A translated and modified version (a shortened nine-items and a one-item-one-pole-format) of Harter's (31) Self-Perception Profile for Children was used to assess self-esteem (e.g., "I feel sure of myself"), physical competence (e.g., "I do well at all sports") and social competence (e.g., "I have a lot of friends"). Participants responded on a five-point Likert scale ranging from strongly disagree to strongly agree. The reliability of Harter's scale has been well documented (32,33). This reliability held true for this adjusted scale, which showed good internal consistency across the three waves of data collection (α -range .74 to .80 for self-esteem, α -range .80 to .86 for physical competence and α -range .80 to .82 for social competence). A 10-day reliability test-retest was executed showing a very strong stability for the self-esteem ($rtt=.89$) and physical competence scale ($rtt=.98$) and moderate stability for the social competence scale ($rtt=.67$).

Prosocial behaviour. A translated and modified version (five items) of Carlo and Randall's (34) Prosocial Tendencies Measure (PTM) was used to capture moral aspects of youth development. The participants were asked about prosocial behaviours in different situations (e.g., "I usually follow rules that have been agreed on") and responded to items on a five-point Likert scale. The Cronbach's Alpha coefficients (α -range .69 to .71 cross the waves) and test-retest reliability ($rtt=.74$) showed evidence that the scale was reliable and internally consistent.

Reported grades. At each time of measurement, participants were asked to write down their grades in three different subjects (mathematics, Swedish language and English) given in the former semester. Since scores are awarded first in the 8th grade in Sweden, only participants older than 15 years were asked to answer this question. The grading system in Sweden is divided into four categories: Fail, Pass, Pass with distinction and Pass with special distinction. Mean grades were calculated and used in the analysis.

Psychosomatic complaints. A modified five-items scale, adapted from "The Bern Subjective Well-Being Questionnaire for Adolescents" (35), was used to assess participants' psychosocial health. Participants were asked to rate the frequency of each psychosomatic complaint (e.g., headache, anxiety, trouble to sleep, stomach ache, back

pain) in the past six months (Never=1, Almost every day=5). Reliability coefficients across the waves were good, with α -values ranging from .72 to .78. The youths' self-report scores presented good test-retest reliability ($rtt=.79$).

Alcohol and tobacco use. Participants in 7th to 12th grade were asked to indicate how often they use alcohol and tobacco (Never, 1-2 times in the past six months, 1-2 times/month, 1-2 times/week, Almost every day). (Never=1, Almost every day=5 ...?) The test-retest reliability scores for alcohol ($rtt=.81$) and smoking ($rtt=.78$) imply a strong consistency when using this scale to assess youth risk behaviours.

Missing value analyses

A missing value analysis was conducted when data was available, examining potential differences between participants from the final and the missing sample ($n=458$) respectively. Results indicated that the final sample was slightly over-represented by younger people ($M_{Missing}=13.48$ years, $M_{Sample}=14.48$ years, $t=4.33$, $p<.001$) and people with Swedish descent ($\chi^2=23.42$, $p<.001$), while no differences were detected with respect to participants' sex or socioeconomic status. Moreover significant differences ($t=-5.40$, $p<.001$) concerning sport involvement were detected, indicating that people within the final sample were more involved in organized sports ($MT1-T3=15.72$, $SD=\pm 13.87$) compared to those in the missing sample ($MT1-T3=10.70$, $SD=\pm 9.99$). When comparing groups in terms of indicators of YPD at T1-T3, no significant differences were found in self-esteem, perceived physical and social competence, prosocial behaviour or reported grades, though differences were observed in psychosomatic complaints ($M_{Missing}=2.43$, $SD=.87$, $M_{Sample}=2.23$, $SD=.70$, $t=4.62$, $p<.001$), smoking ($M_{Missing}=1.88$, $SD=1.33$, $M_{Sample}=1.53$, $SD=.93$, $t=4.60$, $p<.001$) and alcohol use ($M_{Missing}=2.32$, $SD=.98$, $M_{Sample}=1.96$, $SD=.90$, $t=5.05$, $p<.001$).

Data analyses

The data analyses were mainly conducted in three sets. First, in order to highlight cross-sectional comparisons between participants who never have been involved in organized sports with participants involved at some degree, the sports involvement index was divided into three categories (Never involved (SINI); Low involved (SILI), and Highly involved (SIHI)), with the latter two split on the median SI score.

A series of one-way ANOVAs followed by planned comparisons were then conducted to test linear trends associated with sports involvement and indicators of YPD. In line with earlier research, we hypothesized that significant trends would be observed between groups of sport involvement (SINI<SILI<SIHI) and the indicators of YPD used in this study.

Second, we investigated correlations between youths' SI at T1 and indicators of psychosocial development at T3. Third, a series of multiple hierarchical regression analyses were used to test the longitudinal effects of sport involvement on YPD indicators at T3, controlling for preexisting differences and sports dropout. Each prior level outcome variable at T1 (PLO T1) was entered in the first step together with socio-demographic variables. In the second step, the sport involvement variable SIT1 was entered. The dropout variable was entered in the third step to adjust for selection effects out of sports and to test the amount of additional variance of this variable on YPD.

In order to test for multicollinearity (i.e., whether the predictor variables in a regression model correlate too highly) collinearity diagnostics were undertaken (36). The variance inflation factor (VIF) was used to indicate multicollinearity, showing acceptable values for all variables included in the models (<10) (Max=1.78; Min=1.06). The effect size values (f^2) of .02, .15 and .35 were interpreted as small, moderate and large, respectively (26).

Results

Sports Involvement Groups and Developmental Outcomes

In order to test for trends in developmental outcomes related to groups of Sport Involvement (SINI<SILI<SIHI), a one-way ANOVA followed by planned comparisons was conducted using cross sectional data at each point of measurement (T1 and T3). With the exception for prosocial behaviour, psychosomatic complaints and alcohol consumption, results showed a trend in the predictive direction between involvement groups at some point of measurement (see Table 2). (Self-esteem: FT1(2,917)=6.02, $p=.014$, FT3(2,917)=8.63, $p<.003$; Physical competence: FT1(2,917)=185.15, $p<.001$, FT3(2,917)=135.02, $p<.001$; Social competence: FT1(2,917)= 32.13, $p<.001$, FT3(2,917)= 11.51, $p<.001$; Reported grades: FT1=2.72, $p=.100$; FT3(2,917)=14.77, $p<.001$; Tobacco use/smoking: FT1(2,594)=6.29, $p=.012$, FT3(2,594)=2.03, $p=.154$).

Univariable Analyses

Pearson's correlations (see Table 3) revealed that baseline sport involvement (SIT1) was positively associated with end line self-esteem ($r=.15$, $p<.001$), perceived physical ($r=.47$; $p<.001$), and social competence ($r=.21$; $p<.001$) and reported grades ($r=.13$; $p<.001$). A positive but weak correlation ($r=.10$; $p=.016$) was observed between SIT1 and alcohol use at T3.

No significant association was found between SIT1 and prosocial behaviour, psychosomatic complaints or smoking. These results indicate that sports involvement positively influences youths' self-perceptions and grades, but may increase alcohol consumption.

There was strong evidence of association between SES and SI in all waves ($r=.24$ to $.25$, $p<.01$). There was also strong evidence of association between SI and sex ($t=4.77$, $p<.001$, M_{Male}=18.22, SD=±14.90; M_{Female}=13.70, SD=±12.90) and ethnicity ($t=2.03$, $p<.05$, M_{Swedish}=16.67, SD=±14.43; M_{Non-Swedish}=13.40, SD=±13.11). This indicates that being male, having a Swedish background, and belonging to families with higher SES is associated with greater sports involvement.

Multivariate Analysis

Hierarchical regression analyses showed that baseline YPD outcomes strongly predicted YPD outcomes at T3 (see Table 4). Being a male predicted higher self-esteem ($\beta=.14$, $p<.001$) and perceived physical competence ($\beta=.12$, $p<.001$), less psychosomatic complaints ($\beta=-.20$, $p<.001$) and prosocial behaviour ($\beta=-.12$, $p=.002$). Older age predicted more psychosomatic complaints ($\beta=.08$, $p=.015$) and a higher frequency of alcohol consumption ($\beta=.13$, $p=.014$). Non-Swedish ethnicity predicted less perceived social competence ($\beta=.10$, $p=.003$) and less alcohol consumption ($\beta=-.16$, $p<.001$) in comparison to young people with a Swedish background. Notably, there was no evidence of SES predicting any of the outcome variables. After adjusting for dropout and baseline YPD outcomes, baseline sports involvement (SIT1) only predicted perceived physical competence ($\beta=.14$, $p<.001$). The variances explained when adding SIT1 to the model were rather small ($\Delta R^2=2\%$).

A significant relationship between sports dropout and perceived social competence ($\beta=.09$, $p=.010$) as well as prosocial behaviour ($\beta=-.11$, $p=.005$) were observed, indicating a selection out of sport effect, meaning that young people with less favourable social characteristics withdraw from organized sports at higher rates than young people with more favourable characteristics.

Table 2. Mean Differences and Trends ($SI_{Never} < SI_{Low} < SI_{High}$) in Youth Psychosocial Development Outcomes when Comparing Groups of Sports Involvement using Cross-sectional Data at T1 and T3.

Variable	T1					T3				
	n	M	SD	F (trend)	p	n	M	SD	F (trend)	p
Self Esteem				6.02	.014				8.63	.003
SI _{Never}	113	3.69	.88			80	3.57	1.01		
SI _{Low}	413	3.66	.86			418	3.60	.91		
SI _{High}	394	3.90	.73			422	3.88	.75		
Perceived Physical Comp.				185.15	<.001				135.02	<.001
SI _{Never}	113	2.20	.92			80	2.06	.95		
SI _{Low}	413	2.57	.96			418	2.54	1.08		
SI _{High}	394	3.57	.94			422	3.54	1.02		
Perceived Social Comp.				32.13	<.001				11.51	<.001
SI _{Never}	113	3.28	1.06			80	3.49	.92		
SI _{Low}	413	3.39	.94			418	3.50	.97		
SI _{High}	394	3.83	.85			422	3.86	.81		
Prosocial Behaviour				2.50	.114				.58	.446
SI _{Never}	113	3.38	.76			80	3.38	.75		
SI _{Low}	413	3.50	.72			418	3.37	.76		
SI _{High}	394	3.50	.70			422	3.45	.68		
Grades				2.72	.100				14.77	<.001
SI _{Never}	47	2.59	.57			56	2.39	.55		
SI _{Low}	90	2.72	.72			268	2.55	.66		
SI _{High}	126	2.78	.67			273	2.75	.60		
Psychosomatic complaints				.49	.484				.50	.478
SI _{Never}	113	2.13	.76			80	2.16	.91		
SI _{Low}	413	2.22	.78			418	2.32	.86		
SI _{High}	394	2.19	.78			422	2.23	.81		
Alcohol				1.00	.317				.21	.645
SI _{Never}	76	1.80	1.07			56	2.18	1.15		
SI _{Low}	230	1.60	.85			268	2.29	1.12		
SI _{High}	291	1.68	.93			273	2.25	1.07		
Smoking				6.29	.012				2.03	.154
SI _{Never}	76	1.58	1.20			56	1.86	1.48		
SI _{Low}	230	1.36	.91			268	1.94	1.42		
SI _{High}	291	1.29	.81			273	1.59	1.12		

Note. SI_{Never}=Never involved in sports, SI_{Low}=Low degree of involvement in sports, SI_{High}=High degree of involvement in sports.

Table 3. Correlations between Baseline Sport Involvement (SI_{T1}) and Indicators of Youths' Psychosocial Development

Variable	n	M	SD	r with SI at T1	p*
1. Sport Involvement (T1)	920	11.52	10.06	-	-
2. Self Esteem (T3)	920	3.72	.84	.15	.001
3. Perceived Physical Comp. (T3)	920	2.95	1.16	.47	.001
4. Perceived Social Comp. (T3)	920	3.69	.89	.21	.001
5. Prosocial Behaviour (T3)	920	3.41	.71	.00	.822
6. Grades (T3)	597	2.63	.63	.13	.001
7. Psychosomatic complaints (T3)	920	2.30	.85	-.02	.479
8. Alcohol (T3)	597	2.33	1.09	.10	.016
9. Smoking (T3)	597	1.81	1.34	-.07	.101

Note:* Based on Pearson's Correlation.

As a consequence, the difference in prosocial behaviour between sports participants and non-participants increases over time. Dropout from sport also predicted an increase in smoking consumption at T3 ($\beta=.11, p=.033$), indicating that involvement in sport may have a small protective effect that ends once youth decide to withdraw from organized sports.

Discussion

The main purpose of this study was to examine the associations between sport involvement (considering breadth, duration and intensity) and indicators of YPD in Sweden, including self-esteem, perceived physical and social competence, self-reported prosocial behaviours, self-reported psychosomatic health, and the use of alcohol and tobacco. Linear trend analyses revealed significant trends for groups of sport involvement (SINI<SILI<SIHI) and self-esteem, perceived physical and social competence, reported grades, tobacco use/smoking but not in relation to prosocial behaviour, psychosomatic complaints and alcohol consumption. These results support some of the previous findings from cross-sectional studies (i.e.,10,11,12,13) indicating that sport involvement have positive effects on youths' self-perceptions, grades and smoking habits. Moreover, correlation analyses showed significant positive associations between baseline sport involvement (SIT1) and end line self-esteem, perceived physical competence, and reported grades and alcohol use, but no evidence of association between SIT1 and end line prosocial behaviour or psychosomatic complaints.

After adjusting for dropout and prior level outcomes, however, we found that the effects of sport involvement on YPD indicators (with the exception of perceived physical competence) were negligible. These results bring support to some of the sparse longitudinal research done in this area (20,21,22).

As other researchers have pointed out, it must be emphasized that organized sports may have the potential to serve as a site for positive youth development, but this is not something that occurs automatically while being on the field or court (3). Intervention studies have shown promising results indicating that a coach-created, mastery-oriented motivational climate (e.g., receiving positive reinforcement from the coach when working hard, learning something new or helping others learn through cooperation) or using specially designed sport-based programs will significantly enhance the probability of youth learning life skills and developing positive psychosocial characteristics (2,37,38). Consequently, it is important not to take the effectiveness of organized youth sports for granted, potentially missing the opportunity to create an environment that promotes YPD in a more positive manner than observed in this study.

This study supports the conclusion that socialization environments such as the home and school—where children and adolescents spend most of their time—likely have greater influence on youth development outcomes than involvement in organized sports. Additionally, most youth participate in a range of different structured activities apart

Table 4. Multivariate Analysis of Effects of Baseline Sports Involvement (SI_{T1}) and Drop-out from Sports on Indicators of Youths' Psychosocial Development at T3, Controlling for Demographic Variables and Prior Level Outcomes of each Indicator at T1 (PLO T1).

	Indicators of psychosocial development at T3																	
	Self-esteem		Perceived physical competence		Perceived social competence		Prosocial behaviour		Grades		Psychosomatic complaints		Alcohol		Smoking			
	ΔR ²	β	ΔR ²	β	ΔR ²	β	ΔR ²	β	ΔR ²	β	ΔR ²	β	ΔR ²	β	ΔR ²	β		
Step 1																		
PLO T1		.51 ^c		.67 ^c		.54 ^c		.46 ^c		.76 ^c		.52 ^c		.50 ^c		.52 ^c		.52 ^c
Sex		.15 ^c		.13 ^c				-.10 ^b				-.20 ^c						
Age												.09 ^b		.14 ^b				
Ethnicity						.10 ^b								-.16 ^c				
SES																		
Total Adj R ²		.31 ^c		.51 ^c		.33 ^c		.24 ^c		.59 ^c		.37 ^c		.38 ^c		.27 ^c		.27 ^c
Step 2			.02 ^c			.01 ^a												
PLO T1		.50 ^c		.60 ^c		.53 ^c		.46 ^c		.76 ^c		.53 ^c		.50 ^c		.52 ^c		.52 ^c
Sex		.14 ^a		.12 ^c				-.10 ^b				-.20 ^c						
Age												.08 ^b		.13 ^c				
Ethnicity						.10 ^b								-.16 ^c				
SES																		
SI _{T1}		.06		.15 ^c		.07 ^a		.02		.03		.01		.03		-.03		-.03
Total Adj R ²		.31 ^c		.53 ^c		.34 ^c		.24 ^c		.59 ^c		.37 ^c		.38 ^c		.27 ^c		.27 ^c
Step 3			.01 ^c			.01 ^a												
PLO T1		.50 ^c		.60 ^c		.53 ^c		.47 ^c		.76 ^c		.53 ^c		.50 ^c		.51 ^c		.51 ^c
Sex		.14 ^c		.12 ^c				-.12 ^b				-.20 ^c						
Age												.09 ^b		.13 ^b				
Ethnicity						.10 ^b								-.16 ^c				
SES																		
SI _{T1}		.05		.14 ^c		.05		-.01		.04		.01		.03		-.01		-.01
Dropout						-.09 ^b		-.11 ^a								.11 ^a		.11 ^a
Total Adj R ²		.31 ^c		.54 ^c		.35 ^c		.25 ^c		.59 ^c		.37 ^c		.38 ^c		.36 ^c		.36 ^c

Note: Adj R²=Adjusted squared multiple correlation; ΔR²=Change in squared multiple correlation; β= Standardized regression coefficients; Dropout=Participants who withdraw from organized sports and did not re-join during the study (T1-T3).
^ap<.05. ^bp<.01. ^cp<.001. With the exception of SI-values, only significant values are presented in the table.
 Drop-out from Sports on Indicators of Youth's Psychosocial Development at T3,

from sports, which provide occasions for progressively more complex mutual interactions to take place, with potential developmental benefits as a result (8,11).

It has been argued that participation in multiple structured activities contributes to positive youth development through the exploration of a broad range of skills, interests and values, and being exposed to a diversity of people and experiences (23).

Studies that have investigated the patterns of adolescent participation in organized activities have found that participation in sports was more favorable than participation in no activity at all, but participating in organized structured activities (OSA) in combination with sports was most beneficial (21,24,39).

The results of this study highlight the importance of using longitudinal studies that account for variances explained by prior level outcomes, socio-demographic variables and drop-outs from sports, in order to draw appropriate conclusions. Results clearly showed that prior level outcomes predicted a large proportion of the variance in the outcome variables, indicating that the benefits attributed to sport involvement are likely to represent preexisting differences rather than true socialization effects through sports. In line with Bronfenbrenner's (8) bioecological model, other more distal contextual elements represented by sex, age and ethnicity were shown to predict changes in YPD outcomes. Interestingly, no associations were found in relation to participants' SES and YPD outcomes, which may reflect that social inequalities in Sweden are relatively small compared to other Western societies.

This study also emphasizes the importance of considering selection effects out of sports when investigating the effects of sports involvement. To our knowledge, only one study (22) has accounted for these aspects using a longitudinal design. Earlier findings have shown that the majority of children and adolescents dropout of organized sports for reasons not explicitly related to the sport's environment (e.g., they want to be with friends or spend more time on schoolwork or other leisure activities) (40,41). Although not that common, sport-related environmental reasons such as feelings of inadequacy, little sense of belonging, too much pressure to perform well and bad coaches are other notable reasons respondents said they dropped out of sports. As shown by other researchers (e.g.,42,43,44), negative developmental outcomes are related to many of these latter reasons, indicating that sport-related environmental factors may sometimes have a negative effect on indicators of YPD,

making youth want to withdraw from sports, thereby further increasing the psychosocial gap between sport participants and non-participants.

Limitations and Future Research

There are some notable limitations in this study. First, it is important to emphasize that we only have highlighted some of a wide range of psychosocial developmental outcomes (see 13). The answer to the question of the effects of sport on psychosocial development depends on which outcome variables researchers investigate. However, since the selected outcome variables in this study are often found in literature dealing with the socialization effects of sports and are often included in the public discussion concerning youth development through sport, it is reasonable to argue that they can provide a good picture of the effects of organized sport on YPD.

The way we decided to code the SI score may have resulted in under-scoring participants who play many sports but change frequently, thus not playing for many years. In addition this study is based on self-reported data, which may have been subject to desirability bias. It is also important to stress that the settings that athletic youth face constantly change and depend on the type of sports performed (team or individual) and the quality of the relationships to coaches, peers and parents. Future research would benefit from studying what happens inside different sporting contexts in order to reveal the mechanism likely to mediate the association between sport involvement and youth development.

Moreover, trend analyses showed small but significant trends between groups of involvement in relation to self-perceptions, reported grades and tobacco use. Since we do not have retrospective data on intensity (hours/week), and since retrospective reports of duration may have been subject to recall bias, it must be emphasized that the design of the study does not rule out the possible explanation that group differences shown at T1 might be attributed to involvement in sports prior to their participation in the study. Even if we have used retrospective data to stretch the time span, it would be necessary in future research to use longitudinal studies with more than three points of measurements, preferably following youths into adulthood, in order to draw safer conclusions and perhaps reveal presumptive effects shown later in life.

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