

It's Not How Much You Play, but How Much You Enjoy the Game: The Longitudinal Associations Between Adolescents' Self-Esteem and the Frequency Versus Enjoyment of Involvement in Sports

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Abstract The frequency of involvement in sports often has been concurrently and longitudinally associated with higher self-esteem. The interpretation of this association consistently has been framed as involvement in sports leading to higher levels of self-esteem over time (i.e., socialization effect), although no studies have tested whether higher levels of self-esteem lead to increased involvement in sports over time (i.e., selection effect). Another important aspect of involvement in sports that may be related to self-esteem is the degree to which youth *enjoy* sports. However, this aspect has received much less attention. To address these gaps in the literature, we first examined the bidirectional effects between self-esteem and the frequency of involvement in sports with 1,492 adolescents (50.8 % female; 92.4 % Canadian-born) over 4 years. Higher levels of self-esteem predicted greater involvement in sports over time, but greater involvement in sports did not predict higher levels of self-esteem over time, offering support only for selection effects. We then tested the bidirectional effects between the enjoyment of sports and self-esteem and found evidence of both socialization and selection effects. Specifically, greater enjoyment of sports predicted higher self-esteem over time, and higher self-esteem predicted greater enjoyment of sports over time. These novel findings suggest that adolescents with higher self-esteem play sports more frequently and enjoy sports more than adolescents with lower self-esteem. In addition, the degree to which adolescents *enjoy* sports may be more important for increasing self-esteem than the *frequency* with which adolescents play sports.

Keywords Involvement in sports · Self-esteem · Adolescent development · Longitudinal

Introduction

Involvement in sports often has been associated with positive youth development, including higher self-esteem (Blomfield and Barber 2009; Erkut and Tracy 2002; Taylor et al. 2012). Interestingly, the interpretation of the concurrent association found between involvement in sports and self-esteem in particular consistently has been framed as involvement in sports leading to higher levels of self-esteem over time, although generally researchers acknowledge that this interpretation is limited by the use of cross-sectional data (e.g., Blomfield and Barber 2009). Only longitudinal studies can directly assess the direction of effects between involvement in sports and self-esteem; that is, by assessing both measures over time, longitudinal studies can address the question of whether higher levels of involvement in sports lead to increased self-esteem over time (socialization effect), or whether higher levels of self-esteem lead to increased involvement in sports over time (selection effect). Only a handful of longitudinal studies have been conducted in this area, and unfortunately these studies have examined only one direction for the effect; that is, whether involvement in sports leads to increased self-esteem over time (although some researchers have used earlier waves of data to “control” for self-selection, no researchers have tested whether self-esteem predicts involvement in sports over time). Findings from these longitudinal studies have been mixed, with some indicating that involvement in sports directly predicts increased self-esteem over time (e.g., Daniels and Leaper 2006; Fredricks and Eccles 2006), others revealing an indirect (Slutzky and Simpkins 2009) or moderated effect

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(Findlay and Coplan 2008) from involvement in sports to self-esteem, and the remaining showing no support for involvement in sports directly predicting increased self-esteem over time (e.g., Fredricks and Eccles 2008; Kort-Butler and Hageman 2011). Although these researchers have acknowledged the need for longitudinal research in which bidirectional effects between involvement in sports and self-esteem specifically are investigated (e.g., Fredricks and Eccles 2006), to date, no studies have included an examination of bidirectional effects. In addition, the majority of research on the association between youth's involvement in sports and self-esteem has examined the *prevalence* or *frequency* of involvement in sports as predictors of self-esteem (e.g., Fredricks and Eccles 2006; Slutzky and Simpkins 2009); yet, the degree to which youth *enjoy* sports also may be associated with self-esteem. Research on the link between youth's enjoyment of sports and self-esteem is scarce. Only one study has investigated this association to our knowledge (i.e., Shaffer and Wittes 2006). Thus, we addressed these gaps in the literature in the current study.

Self-Esteem, Involvement in Sports, and the Enjoyment of Sports

Self-esteem is thought to be comprised of several dimensions, including self-concept about ability in sports (e.g., Sonstroem et al. 1994; Slutzky and Simpkins 2009). According to Kinch (1963), social interactions may influence self-concept. For example, positive experiences in sports may lead to a positive sport self-concept, and thus may lead to increases in general self-esteem (i.e., socialization effects). In addition, self-concept may guide behavior (Kinch 1963). Thus, an individual with a more positive sport self-concept and higher levels of self-esteem may be more likely to get involved in sports than an individual with a less positive sport self-concept and lower levels of self-esteem (i.e., selection effects). For example, Taylor and Brown (1988) hypothesize that individuals with higher self-esteem may be more likely to feel optimistic about what they are capable of and have the confidence necessary to attempt and conquer novel challenges, compared to individuals with lower self-esteem (see also Bowker et al. 2003; Harter 1990). Conversely, individuals with lower self-esteem may be more likely to feel inadequate, incompetent, and expect to fail, than those with higher levels of self-esteem (Bowker et al. 2003). Thus, individuals with higher self-esteem may be more likely to get involved in sports than individuals with lower self-esteem. However, researchers only have investigated socialization effects, and thus it is important to assess both selection effects and socialization effects simultaneously by conducting a bidirectional examination of the association between adolescent's frequency of sports involvement and self-esteem.

The majority of research on the socialization effect of youth's involvement in sports on self-esteem has been focused on the *prevalence* (yes/no) or the *frequency* of involvement in sports as predictors of self-esteem (e.g., Fredricks and Eccles 2006; Slutzky and Simpkins 2009), yet there is an aspect of involvement in sports that may be more pertinent to self-esteem but which has received much less attention: youth's level of *enjoyment* of sports. For example, the enjoyment of sports is the most common motive that individuals report for participating in sports (e.g., Battista 1990; Scanlan and Lewthwaite 1986; Shaffer and Wittes 2006), and has been shown to be strongly related to youth's commitment to sports (e.g., Scanlan et al. 2003). Furthermore, Shaffer and Wittes (2006) found evidence for a concurrent association between the enjoyment of sports and self-esteem. Specifically, Shaffer and Wittes asked a sample of college women to provide retrospective accounts of their pre-college participation in sports, including the degree to which they enjoyed playing those sports. The women also were asked to report their current levels of self-esteem. Shaffer and Wittes found a direct association between participation in sports and self-esteem, and found that the enjoyment of sports mediated this association. Specifically, participation in sports was associated with higher levels of the enjoyment of sports, and, in turn, the enjoyment of sports was associated with higher levels of self-esteem.

At the same time, similar to our hypothesis that self-esteem may predict the frequency of involvement in sports, there also may be selection effects in that individuals with higher self-esteem may enjoy sports more than individuals with lower self-esteem. For example, individuals with higher self-esteem may be more optimistic (Taylor and Brown 1988) about their sport abilities and may have more confidence to overcome challenges than individuals with lower self-esteem (Bowker et al. 2003; Harter 1990), and thus may be more likely to enjoy the sports that they play than individuals with lower self-esteem. Consistent with this notion, Scarpa and Nart (2012) found that adolescents' levels of perceived sport competence were positively associated with their enjoyment of physical activity in general. The direction of effects between the enjoyment of sports and self-esteem is unclear, however, as this association has not been studied longitudinally. Indeed, to our knowledge, Shaffer and Wittes (2006) are the only researchers who have examined the link between the enjoyment of sports and self-esteem. Therefore, it is important to examine both socialization and selection effects simultaneously between adolescents' self-esteem and enjoyment of sports in order to ascertain the direction of effects of this association.

The Current Study

The goals of the current study were twofold. Our first goal was to examine whether self-esteem predicts the frequency of involvement in sports over time or whether the frequency of involvement in sports predicts self-esteem over time by examining the bidirectional association between the frequency of involvement in sports and self-esteem. Considering that concurrent studies consistently have demonstrated an association between involvement in sports and self-esteem, and that individuals with higher self-esteem may be more optimistic and confident about their abilities than individuals with lower self-esteem, we hypothesized that higher levels of self-esteem would predict greater frequency of involvement in sports over time (selection effect). In contrast, we did not have an explicit hypothesis regarding whether the frequency of involvement in sports would predict self-esteem, as previous longitudinal findings regarding socialization effects have been inconsistent (e.g., Daniels and Leaper 2006; Fredricks and Eccles 2008).

Our second goal was to investigate the bidirectional association between the enjoyment of sports and self-esteem over time. Consistent with evidence of a concurrent association between the enjoyment of sports and self-esteem (Shaffer and Wittes 2006), we hypothesized that the enjoyment of sports would be associated with self-esteem over time; however, the direction of effects is unclear due to the absence of longitudinal research on this association. Thus, we did not have specific hypotheses regarding whether the enjoyment of sports would predict self-esteem over time (socialization effect), or whether self-esteem would predict the enjoyment of sports over time (selection effect).

To address these goals, we conducted a 4-years longitudinal study of high school students. We simultaneously assessed the socialization and selection hypotheses in the relationship between the frequency of involvement in sports and self-esteem. We also examined the bidirectional relationship between the enjoyment of sports and self-esteem while controlling for the frequency of involvement in sports. Finally, we assessed whether gender was a significant moderator of the results.

Methods

Participants

Students ($N = 1,492$) from eight high schools in Ontario, Canada took part in the study over 4 years from grade 9 to 12 (M age in grade 9 = 13 years, 10 months). This study

was part of a larger cohort-sequential project examining youth lifestyle choices. The overall participation rate ranged from 83 to 86 % across the four waves. Consistent with the broader Canadian population (Statistics Canada 2001), 92.4 % of the participants were born in Canada and the most common ethnic backgrounds reported other than Canadian were Italian (31 %), French (18 %), British (15 %), and German (12 %). Data on socioeconomic status indicated mean levels of education for mothers and fathers falling between “some college, university or apprenticeship program” and “completed a college/apprenticeship/technical diploma.” Furthermore, 70 % of the respondents reported living with both birth parents, 12 % with one birth parent and a stepparent, 15 % with one birth parent (mother or father only), and the remainder with other guardians (e.g., other relatives, foster parents, etc.).

Only students who completed the survey at a minimum of 2 time points over the 4 waves were included, resulting in 1,492 participants (50.8 % female), or 84 % of the total sample of 1,771 adolescents. There were no significant differences on any of the study measures between participants who completed the survey only in grade 9 and the longitudinal participants, $ps > .05$. Missing data resulted from absenteeism and because some students did not finish the entire questionnaire (10.6 % of the data, consistent with other longitudinal survey studies; e.g., (Ciarrochi et al. 2009; Feldman et al. 2009; Hyde and Petersen 2009). We included three versions of the survey at each time period so that the same scales were not always near the end of the survey. As missing data were not dependent on the values of the study measures, it is reasonable to assume that these data are missing at random (Little and Rubin 2002; Schafer and Graham 2002) and full information maximum likelihood estimation (FIML) was used to estimate the models in AMOS 19 (Arbuckle 1995–2012).

Procedure

Active informed assent was obtained from the adolescent participants. Parents were provided with written correspondence mailed to each student’s home prior to the survey administration outlining the study; this letter indicated that parents could request that their adolescent not participate in the study. An automated phone message about the study also was left at each student’s home phone number. This procedure was approved by the participating school board and the University Research Ethics Board. At all time periods, the questionnaire was administered to students in classrooms by trained research staff. Students were informed that their responses were completely confidential.

Measures

All measures were assessed across all four grades of high school (i.e., grades 9 through 12) except for gender, parental education, and at-risk background which were only assessed in grade 9, and the enjoyment of sports which was assessed in grade 10, 11, and 12.

Demographic Factors

A single-item question was used to assess participant sex. Parental education was an average of two items (one per parent, $r = .58$). At-risk background was assessed by counting the number of risk factors that participants reported (i.e., participants were asked to indicate *yes* or *no* to the question of whether they have a learning disability, are living or have lived in foster care, started using marijuana prior to age 13, have parents/guardians who engage in narcotic use, had a teen mother, have parents who are depressed, or have parents who divorced). Higher scores indicated female gender, greater parental education (1 = *did not finish high school* to 6 = *professional degree*), and a greater number of risks.

The Frequency of Involvement in Sports

The frequency of involvement in sports was measured with two items (“How often in the last month have you played organized sports in school?” and “How often in the last month have you played organized sports outside of school?”), based on a 5-point scale (1 = *never*; 2 = *once or twice a month*; 3 = *once a week*, 4 = *several times a week*; 5 = *everyday*). These anchors are similar to anchors used in previous studies in which participants were asked to report how many times per week they participate in sports on a scale of 1–5 (e.g., Babiss and Gangwisch 2009; Daniels and Leaper 2006). We chose these anchors to assess the frequency of involvement in sports instead of asking adolescents how many hours per week they play sports (e.g., Slutzky and Simpkins 2009), because adolescents may be less likely to recall accurately the total number of hours per week that they play sports. For example, many adolescents play several different sports during the same time period and their games and practices often vary in length, thus making it difficult to recall the precise number of hours per week that they play sports. Hence, the anchors that we used may lead to less error variance in adolescents’ self-reports of their frequency of involvement in sports, compared to reporting the number of hours per week. Because each item (school sports and sports outside of school) included both competitive and house league sports, adolescents’ experiences in school sports should be similar to their experiences in sports

played outside of school. Thus, we combined these items to create a composite score for the frequency of involvement in sports, consistent with previous research (e.g., Fredricks and Eccles 2006). The correlation between the two items in each Grade was $>.43$.

The Enjoyment of Sports

In grades 10, 11 and 12, participants who indicated that they had played sports were then asked how often they enjoyed participating in those sports on a 5-point scale (1 = *never* to 5 = *every time*). Participants who indicated that they did not play sports were not asked about their enjoyment of sports, as it is not possible for participants to assess their enjoyment of an activity that they did not participate in.

Self-Esteem

Self-esteem was measured with Rosenberg’s (1965) Self-Esteem Scale. The measure included 10 items (e.g., I take a positive attitude toward myself) that were rated on a 5-point scale (1 = *strongly disagree* to 5 = *strongly agree*). Cronbach’s α was $>.85$ each year.

Plan of Analysis

In order to assess longitudinally the socialization and selection hypotheses between self-esteem and the frequency of involvement in sports we created a 4-wave (grade 9–12) autoregressive cross-lagged model in AMOS 19 (Arbuckle 1995–2012), in which bidirectional paths were estimated across each adjacent grade between self-esteem and involvement in sports (Fig. 1). Stability paths across grades within each variable and covariances among the variables within each grade were specified. Gender, parental education, and at-risk background were included as covariates.

To elucidate further the relationship between sports and self-esteem, we added a test of the bidirectional association between self-esteem and the enjoyment of sports. Only participants who reported playing sports in grades 10, 11, and 12 were included in this analysis ($N = 636$; see Method section). In order to assess simultaneously the socialization and selection hypotheses between self-esteem and the enjoyment of sports while controlling for the frequency of involvement in sports, we created a 3-wave (grade 10–12) autoregressive cross-lagged model in AMOS 19 (Arbuckle 1995–2012), in which bidirectional paths were estimated across each adjacent grade between self-esteem, the enjoyment of sports, and the frequency of involvement in sports (Fig. 2). Stability paths across grades

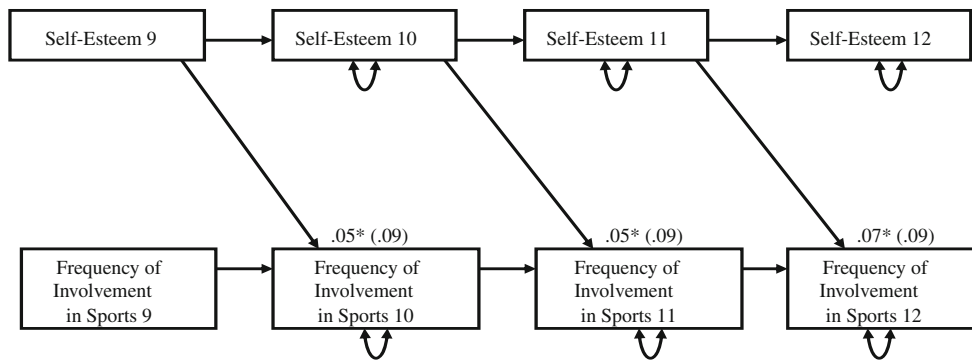


Fig. 1 Final model results for analysis assessing bidirectional effects between self-esteem and the Frequency of Involvement in sports. Notes * < .001, 9 = grade 9; 10 = grade 10; 11 = grade 11; 12 = grade 12. Not shown are covariances among variables within each grade, or paths related to covariates. Standardized and

unstandardized coefficients (unstandardized are in brackets and are identical across grade as cross-lagged paths were invariant across grade) are reported for significant cross-lagged paths. Results for covariates, covariances, and stability paths can be obtained from the first author

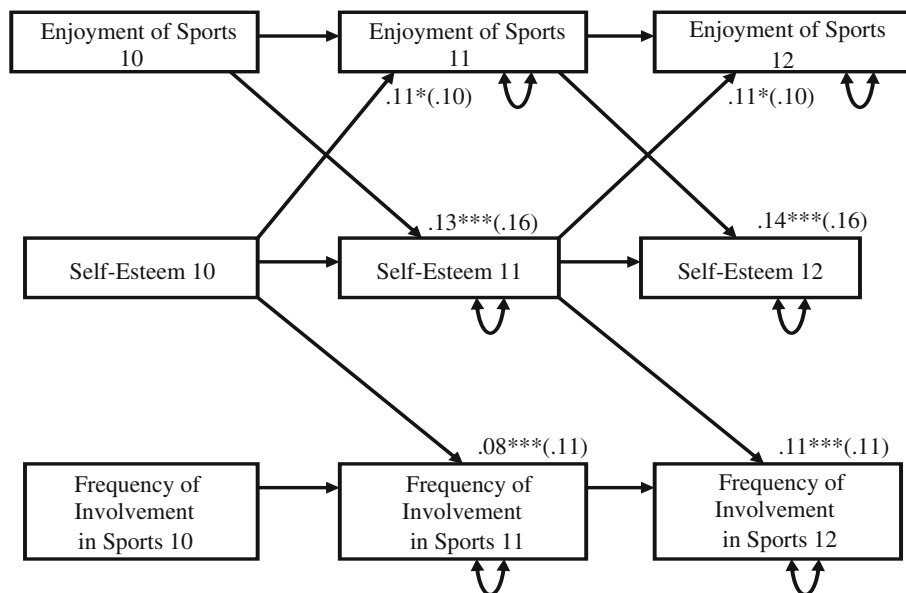


Fig. 2 Final model results for analysis assessing bidirectional effects between the enjoyment of sports and self-esteem, controlling for the frequency of involvement in sports. Notes *** < .001, * < .05; 10 = grade 10; 11 = grade 11; 12 = grade 12. Only significant paths are shown. Not shown are covariances among variables within

each grade, or paths related to covariates. Standardized and unstandardized coefficients (unstandardized are in brackets and are identical across grade as cross-lagged paths were invariant across grade) are reported for significant cross-lagged paths. Results for covariates, covariances, and stability paths can be obtained from the first author

within each variable and covariances among the variables within each grade were specified. Gender also was included as a moderator in each analysis.

Results

Preliminary Analyses

Table 1 outlines the means and standard deviations for the study variables. The correlations among the variables from

the primary analysis are reported in Table 2. As indicated in the correlation table, males reported higher levels of self-esteem in grades 9 and 10, as well as more frequent involvement in sports in all four grades than females. Participants with higher levels of parental education reported higher levels of self-esteem and more frequent involvement in sports in all four grades than participants with lower levels of parental education. Participants who had a more at-risk background had lower self-esteem than participants who had a less at-risk background. Importantly, positive correlations between the frequency of

Table 1 Means and standard deviations of study measures and demographic variables

Variable	Grade 9 M (SD)	Grade 10 M (SD)	Grade 11 M (SD)	Grade 12 M (SD)
Parental education	3.27 (1.03)	n/a	n/a	n/a
At-risk background	0.53 (0.84)	n/a	n/a	n/a
Self-esteem	3.81 (0.71)	3.76 (0.77)	3.75 (0.71)	3.75 (0.71)
Involvement in sports	2.47 (1.17)	2.38 (1.22)	2.21 (1.19)	2.18 (0.92)
Enjoyment of sports ^a	n/a	4.51 (0.59)	4.58 (0.62)	4.44 (0.65)

$N = 1,492$

^a Means and standard deviations for enjoyment of sports were based on a sub-sample of participants who reported playing sports in grades 10, 11 and 12 ($N = 636$)

Table 2 Correlation table for the primary analysis from grades 9 through 12

Variable	1	2	3	4	5	6	7	8	9	10	11
1. Gender	–										
2. Parental education	–.05	–									
3. At-risk background	–.06	–.10	–								
4. Self-esteem 9	–.18	.16	–.07	–							
5. Self-esteem 10	–.17	.15	–.04	.57	–						
6. Self-esteem 11	–.03	.12	–.07	.45	.57	–					
7. Self-esteem 12	–.01	.12	–.14	.46	.50	.62	–				
8. Involvement in sports 9	–.19	.15	.03	.14	.15	.11	.11	–			
9. Involvement in sports 10	–.15	.16	.02	.18	.17	.12	.12	.60	–		
10. Involvement in sports 11	–.20	.19	–.01	.19	.19	.15	.13	.53	.72	–	
11. Involvement in sports 12	–.19	.18	–.05	.18	.18	.17	.10	.46	.58	.66	–

Implied correlations are shown; 9 = grade 9; 10 = grade 10; 11 = grade 11; 12 = grade 12. Any correlation .06 or higher is significant at $p < .05$

involvement in sports and self-esteem, as well as between the enjoyment of sports and self-esteem (note that the latter correlations ranged from .13 to .24; they are not in correlation table because the enjoyment of sports variable was assessed only for three waves), suggests that these variables are associated over time.

Long-Term Association Between Self-Esteem and the Frequency of Involvement in Sports

We first tested whether the pattern of results was invariant across grade (i.e., consistent across the high school years). Invariance was tested by comparing a model in which all cross-lagged paths were constrained to be equal across grade to the unconstrained model in which all structural paths were free to vary. The Chi square difference test of relative fit indicated that the unconstrained model in which all structural paths were free to vary was not a significantly better fit than a model in which all cross-lagged paths were constrained to be equal across grade, suggesting that the patterns of associations among the measures were consistent across

the high school years, $p > .05$. As the constrained model was the most parsimonious model, all further interpretations were based on the constrained model. Model fit was good, $\chi^2(10) = 19.76$, $p > .05$, CFI 1.00, TLI = .99, RMSEA = .026 (.007–.042). See Fig. 1 for a summary of the significant path estimates. We found evidence for selection effects, but not socialization effects. Specifically, self-esteem significantly predicted higher frequency involvement in sports over time, after controlling for previous frequency of involvement in sports, whereas the frequency of involvement in sports did not predict higher self-esteem over time, after controlling for previous self-esteem.

Long-Term Association Between Self-Esteem and the Enjoyment of Sports

We first tested whether the pattern of results was invariant across grade (i.e., consistent across the high school years) by comparing a model in which all cross-lagged paths were constrained to be equal across grade to the unconstrained model in which all structural paths were free to vary. The

Chi square difference test of relative fit indicated that the unconstrained model in which all structural paths were free to vary was not a significantly better fit than a model in which all cross-lagged paths were constrained to be equal across grade, suggesting that the patterns of associations among the measures were consistent across the high school years, $p > .05$. As the constrained model was the most parsimonious model, all further interpretations were based on the constrained model. Model fit was excellent, $\chi^2(12) = 13.86$, $p < .05$, CFI 1.00, TLI = .99, RMSEA = .016 (.000–.045). See Fig. 2 for a summary of the significant path estimates. We found evidence for both socialization and selection effects. Specifically, the enjoyment of sports predicted higher self-esteem over time after controlling for previous self-esteem and the frequency of involvement in sports. Also, self-esteem predicted greater enjoyment of sports over time, after controlling for previous enjoyment of sports and the frequency of involvement in sports. Finally, consistent with our main analysis, self-esteem predicted the frequency of involvement in sports over time after controlling for previous frequency of involvement in sports and enjoyment of sports, but the frequency of involvement in sports did not predict self-esteem after controlling for previous self-esteem.

Gender as a Moderator

There were no significant differences in the pattern of findings as a function of gender ($ps > .05$ in χ^2_{diff} tests between constrained and unconstrained models).

Discussion

To date, longitudinal studies on the relationship between involvement in sports and self-esteem have examined socialization effects (involvement in sports predicting self-esteem over time), but not selection effects (self-esteem predicting involvement in sports over time). In addition, although researchers have examined the concurrent association between the enjoyment of sports and self-esteem (e.g., Shaffer and Wittes 2006), no researchers have examined this association longitudinally. Thus, it is important to conduct bidirectional examinations of the association between adolescents' self-esteem and frequency of involvement in sports, and between adolescents' self-esteem and enjoyment of sports, in order to ascertain the direction of effects of these associations.

Consistent with the notion that an individual's self-concept may influence his or her behavior (Kinch 1963), we found that youth with higher self-esteem were more likely to play sports over time. In contrast, we found that the frequency of involvement in sports did not predict self-

esteem over time. In addition, we found that greater enjoyment of sports predicted higher self-esteem over time, and higher self-esteem predicted greater enjoyment of sports over time. This pattern of findings was consistent across the high school grades and across males and females, and has important implications as research to date has been focused primarily on the socialization effect of the frequency of involvement in sports on self-esteem. First, the finding that adolescents with higher self-esteem play sports more frequently and enjoy sports more than adolescents with lower self-esteem highlights the advantage of conducting longitudinal studies in which all study measures are assessed at each wave of data collection, and should encourage researchers to examine both selection and socialization effects when studying the link between involvement in sports and self-esteem. In addition, evidence of selection effects suggests that efforts to increase youth involvement in sports and enjoyment should be targeted toward youth with lower self-esteem in particular. For example, considering that youth with lower self-esteem may be less optimistic or confident about their abilities than youth with higher self-esteem, they may be intimidated by competitive sports environments, and thus may prefer less competitive sports environments in which they can have fun and improve their skills without feeling a great deal of pressure or judgment from coaches, teammates, or spectators. Therefore, our findings suggest that it may be important for public policy makers, educators, and youth program directors to continue to promote organized intramural/recreational sports leagues both in and outside of high school for students who do not play on competitive teams, in order to increase involvement in sports among youth with lower self-esteem.

In terms of socialization effects, the results suggest an important addendum to the popular notion that playing sports more frequently may predict higher self-esteem. Specifically, it may be more important for adolescents to participate in sports that they thoroughly *enjoy* in order to promote higher self-esteem, than to participate more *frequently* in sports. Not only does this finding have important implications for researchers who have focused mainly on the link between the frequency of involvement in sports and self-esteem, but also for parents who may encourage their adolescents to participate frequently in sports. For example, adolescence is a period when sports attrition increases (e.g., Guillet et al. 2006), and this may concern parents who believe that sports are associated with positive psychological outcomes. In terms of increasing self-esteem, however, our results suggest that it may be more effective for parents to encourage their adolescents to maintain involvement in the sports that they thoroughly enjoy, than to maintain their level of the frequency of overall involvement in sports.

One explanation for why the socialization effect of the frequency of involvement in sports on self-esteem was not supported in the present study may be that less skilled players make more errors, and thus may receive more criticism and less praise from their coaches and teammates than more skilled players. Thus, in terms of adolescents' sport self-concept, for less skilled players playing sports may lead to a negative sport self-concept, and in turn may lead to lower self-esteem. On the other hand, this effect would not be true for more skilled players who might develop a positive sport self-concept over time as they gain recognition for their sports skills, and thus may experience an increase in self-esteem.

An important limitation of the present study stems from the reliance on self-report measures. Reports of involvement in sports would benefit from corroboration from other informants (e.g., friends, parents). Yet, it is not clear whether anyone other than the adolescent can provide an accurate assessment of their self-esteem given that it is a very personal and subjective construct. Importantly, however, we specified covariances among all of the variables within each time period in both models, thus accounting for common method variance. Our measures of adolescents' involvement in sports and enjoyment of sports also were limited in several ways. First, the involvement in sports measure could not assess the heterogeneity of adolescents' sports experiences, such as whether they played competitive versus house league sports or team-based versus individualized sports. These differences in adolescents' participation in sports may be important to examine in future research, as they may be associated with adolescents' levels of self-esteem. Second, although asking adolescents how often they played sports in the past month may lead to less error variance than asking them to report the number of hours that they play per week, it cannot detect differences between participants in terms of the amount of sports played during any given day. For example, if two adolescents play sports once a week, but one adolescent plays for four hours each time while the other plays for one hour each time, then they would still get the same score on the measure of frequency of involvement in sports that was used in the current study, even though one adolescent plays sports for more hours per week than the other. Thus, future research may benefit from assessing youth's involvement in sports both ways (i.e., how often they played sports in the past month and how many hours they played per week). Finally, although our measure of adolescents' enjoyment of sports had good face validity, a multi-item measure such as the 8-item scale used by Shaffer and Wittes (2006) may be beneficial to use in future research, so that the internal reliability of the measure can be assessed.

Another potential concern may be that the structural paths that were significant in the present study were small in magnitude. However, these effect sizes are common in longitudinal cross-lagged models when accounting for

stability between adjacent waves of data and for concurrent associations among variables within each grade. Also, it is important to note that these results only apply to the adolescent developmental period, and may not generalize to different age groups. For example, many youth begin playing sports in childhood (e.g., Slutzky and Simpkins 2009), and thus it is unclear whether the frequency of involvement in sports may predict self-esteem during this earlier development period. Future research should be aimed at examining the longitudinal association between the frequency of involvement in sports, self-esteem, and the enjoyment of sports in a younger sample. Finally, although the participants in the present study included a large sample of enrolled students from a school district, findings may not generalize to other geographic regions, including those with differing ethnic and/or demographic populations.

Conclusions

We found that self-esteem predicted the frequency of involvement in sports over time, while the frequency of involvement in sports did not predict self-esteem over time. Furthermore, we found that the enjoyment of sports predicted self-esteem over time, and self-esteem predicted the enjoyment of sports over time. In terms of selection effects, the current findings suggest that adolescents with higher self-esteem play sports more frequently and enjoy sports more than adolescents with lower self-esteem. In terms of socialization effects, the current findings suggest that the degree to which adolescents *enjoy* sports may be more important for increasing self-esteem than the *frequency* of their involvement in sports. These findings represent important advances in our understanding of the link between involvement in sports and self-esteem. Perhaps if individuals are encouraged to find a sport that they thoroughly enjoy at a young age, they may experience increases in self-esteem, which, in turn, may help set them on active and healthy trajectories that continue into their adolescent and adult years.

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Author contributions PA conceived the study, conducted most of the statistical analyses, and drafted the manuscript. TW collected the data and participated in the statistical analyses as well as the drafting of the manuscript. All authors read and approved the final manuscript.

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