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Can Sports Mitigate the Effects of Depression and Aggression on Peer Rejection?

Andreann Perron-Gélinas

Mara Brendgen

Frank Vitaro

Andreann Perron-Gélinas, University of Quebec in Montreal (Canada); Mara Brendgen, University of Quebec in Montreal (Canada); Frank Vitaro, University of Montreal (Canada); Brendgen and Vitaro are also affiliated with the Ste. Justine Hospital Research Centre, Montreal.

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Correspondence concerning this article should be addressed to Mara Brendgen, Psychology Department, University of Quebec in Montreal, Case postale 8888, succursale Centre-ville, Montréal (Québec) H3C 3P8 Canada. E-mail : [brendgen.mara@uqam.ca](mailto:brendgen.mara@uqam.ca)

## Abstract

This study examined whether sports participation moderates the longitudinal link of depressive and aggressive symptoms with increased peer rejection. The sample consisted of 291 adolescents (50.5% girls), assessed at ages 12 and 13 years. Depressive and aggressive symptoms as well as peer rejection were assessed through peer nominations, whereas participation in team and individual sports was assessed via adolescents' self-reports. Regression analyses revealed that boys – but not girls – who displayed high levels of depressive symptoms experienced an increase in peer rejection. However, participation in team sports mitigated the association between depressive symptoms and increased peer rejection in boys, whereas participation in individual sports exacerbated that same association. Although aggressive symptoms were also associated with an increase in peer rejection for boys and girls, sports participation did not moderate this link. These results support the usefulness especially of team sports as part of prevention activities for vulnerable youth.

### Can Sports Mitigate the Effects of Depression and Aggression on Peer Rejection?

Peers provide a unique context for the acquisition of social skills, the validation of the self-concept, and the learning of social roles, norms, and processes involved in interpersonal relationships (Boivin, Vitaro, & Poulin, 2005). This distinctive role of peers gains even more importance in adolescence, when youngsters become increasingly autonomous from parents and turn to peers for advice and support (Berndt, 1979). Not surprisingly, youth who are disliked and rejected by the majority of their peers are at serious risk for future developmental maladjustment. Indeed, numerous studies show that peer rejection is associated with an increase in internalizing and externalizing problems, with some of these negative consequences observed up to ten years later (Nelson & Dishion, 2004; Prinstein & Aikins, 2004; Prinstein & Cillessen, 2003). Sadly, peer rejection remains relatively stable over time and even across school contexts, thus aggravating the potential for developmental maladjustment (Veronneau, Vitaro, Brendgen, Dishion, & Tremblay, 2010). In light of the negative sequelae associated with peer rejection, researchers have devoted considerable efforts to understanding why some children may become rejected by their peers.

### **The Role of Depressive and Aggressive Symptoms in Predicting Peer Rejection**

Longitudinal studies show that – in addition to being potential consequences of peer rejection – pre-existing externalizing problems during childhood are also among the most important risk factors of becoming rejected by the peer group (Cillessen & Mayeux, 2004; van Lier & Koot, 2010). In contrast, there is little evidence for an association between internalizing problems in childhood and increased peer rejection. During adolescence, however, internalizing problems – especially depressive symptoms – also become an important risk factor that may even surpass the predictive effect of aggression in predicting problematic peer relationships, including a lack of acceptance and negative treatment by the peer group (Brendgen, Girard, Vitaro, Dionne, & Boivin, In press; Zimmer-Gembeck, Hunter, Waters, & Pronk, 2009).

Although depressive and aggressive symptoms are very different in nature, youth who display these symptoms are similar in many ways. Indeed, both depressive and aggressive symptoms are associated with poorer social skills and emotion regulation abilities, as well as reduced sensitivity for the well-being of others (Flouri & Sarmadi, 2016; Garnefski, Kraaij, & van Etten, 2005; Perren & Alsaker, 2009). Aggressive and depressive youngsters also often report feeling as if they “do not belong” (Newman, Lohman, & Newman, 2007). These characteristics may contribute to peer rejection in several ways. For example, they can make individuals with depressive symptoms react to a perceived threat with withdrawal, abandonment and internalization of blame, thus interfering with positive social interactions (Renshaw & Brown, 1993). These individuals often display interactive behaviors that may be considered by others as irritating, such as frequent complaints as well as the tendency to focus on negative cognitions and emotions (Coyne, 1976a, 1976b). For aggressive individuals who feel threatened or provoked by others, the same characteristics may lead to impulsive and hostile reactions. Aggressive youngsters’ low frustration tolerance and tendency to blame others for their mistakes can also contribute to transforming a positive or neutral social interaction into a negative one (Dodge, Pettit, McClaskey, & Brown, 1986; Eisenberg & Fabes, 1992). Because internalizing and externalizing symptoms are also known consequences of peer rejection (Prinstein & Aikins, 2004; Prinstein & Cillessen, 2003), such negative interactions may place youth with depressive and aggressive symptoms on a continued spiral of increasing symptoms and further worsening social relations.

Effect sizes of aggressive and depressive symptoms predicting negative peer attitudes are typically moderate, however, suggesting that not everyone who displays these characteristics will be rejected by peers. To prevent peer rejection and its harmful consequences, it is thus important to identify variables that can mitigate – either through a main effect or through a protective moderating effect – the risk of peer rejection in vulnerable youth. Ideally, these potential mitigating variables

should also be easily incorporated in relatively low-cost preventive intervention efforts. One such variable may be sports participation.

### **Participation in Sports and Peer Rejection**

Several findings lend support to the notion that sports may be beneficial for youngsters' social standing in the peer group. Children and adolescents consider "being good at sports" as among the most important determinants of peer popularity – or lack thereof – for both boys and girls (Chase & Dummer, 1992; Shakib, Veliz, Dunbar, & Sabo, 2011). Among adolescents, sports participation has also been associated with higher peer-rated acceptance (Daniels & Leaper, 2006). In addition, compared to youth who do not participate in sports, those who do report better self-control, more assertive behaviors, higher self-esteem, and are rated by their teacher as displaying greater social competence (Findlay & Coplan, 2008; McHale et al., 2005). Moreover, compared to adolescents who participate in other types of extracurricular activities, those who engage in sports report more occasions for learning and practicing emotion regulation, initiative and teamwork (Hansen, Larson, & Dworkin, 2003; Larson, Hansen, & Moneta, 2006). Sports participation may thus be particularly beneficial for youngsters with depressive or aggressive symptoms. Along with improving sports-related skills and physical health and well-being, sports participation may provide youth who display depressive or aggressive symptoms with opportunities to improve the social and personal skills necessary for successful peer relations, and as result, protect them against a decrease in social status. Still, no study so far has examined the association between youngsters' *frequency* of sports participation with changes in their *peer-rated* (rather than self-assessed) social standing among peers over time. Moreover, no study has investigated the potential interactive effect between sports participation and personal risk factors such as depressive or aggressive symptoms.

It is also unclear whether any putative main or moderating effect of sports participation follows a linear pattern of "more is better". Some authors have suggested that an over involvement in sports (or

other extracurricular activities) can lead to negative consequences, because the time invested in sports can take away from other activities that are developmentally important for the child (Fredricks, 2012). Having to balance the time they spend in different activities is also believed to lead to stress or anxiety among youth (Luthar & Sexton, 2004; Mahoney, Harris, & Eccles, 2006). So far, the few studies that tested the overscheduling hypothesis either found little evidence of the effect (Luthar, Shoum, & Brown, 2006) or found decreased benefits only at extremely high levels of participation, i.e., 20 hours or more per week (Fredricks, 2012; Mahoney et al., 2006). Nevertheless, the possible presence of an overscheduling effect – as indicated by a curvilinear main or moderating effect of sports participation – should be considered when analyzing the data.

### **Team Sports Versus Individual Sports**

Apart from the frequency of participation, the context in which the sport is being played is also an important factor to consider. Of specific significance in this regard may be whether youth engage in sporting activities with a team of same-age peers or not. Although individual sports are often played alongside other people, what differentiates individual from team sports is the fact that in team sports individuals compete together, as a group, in hopes of winning against another team. It also creates opportunities for interacting with peers in a prosocial context (Pedersen & Siedman, 2004). By definition, a team is interdependent, as players must work together to achieve their common goal (Jackson, Keiper, Brown, Brown, & Manuel, 2002). In contrast, individual sports are defined as a sport where the participant competes as an individual. Therefore, in individual sport settings, peers may sometimes be viewed as competitors. Learning how to cooperate and compromise with others when striving for a common goal, or to plan and execute strategies as a team are essential skills for positive interactions, even in other social contexts. Furthermore, learning through teamwork how to communicate better and to positively interact with others may attenuate hostile attributions and other

negative biases, which could be particularly beneficial for adolescents with depressive or aggressive symptoms (Hall, 2016)

In line with this notion, adolescents participating in team sports such as soccer or football report more opportunities to improve their emotion regulation abilities, their social and leadership skills, and their sense of initiative, compared to adolescents enrolled in individual sports such as gymnastics or swimming (Denault & Poulin, 2016; Hansen et al., 2003). Results from another study also suggest that team sports is more intrinsically motivating compared to individual sports, which could be explained by the fact that team players report increased positive social interaction and enjoyment while participating in their sports activity (Nielsen et al., 2014). The authors further proposed that the numerous opportunities for social interactions in the team sport context may contribute to the participants rating this type of sport as a more positive setting. When individuals unite together to strive for the same common goal such as winning against the opposing team, they also often develop a sense of superordinate group identity (Kernan & Greenfield, 2005). Being a member of a sport team may thus fulfill the fundamental human need for belonging (Baumeister & Leary, 1995). This notion is also supported by findings of a positive association between team sports participation and social acceptance (Boone & Leadbeater, 2006). Moreover, athletes who participate in team sports show fewer depressive symptoms compared to those participating in individual sports (Miller & Hoffman, 2009; Nixdorf, Frank, & Beckmann, 2016). Participation in team – but not individual – sports has also been found to protect victimized children from an increase in externalizing problems and depressive symptoms (Perron et al., 2012). Together, these findings emphasize the importance of considering the context of sport participation when assessing its potential benefits for youth who are at risk of being rejected by their peer group.

### **The Present Study**

The main objective of this study was to investigate a possible moderating effect of sports participation in regard to the predictive link between adolescents' depressive and aggressive symptoms and increased peer rejection, while considering the frequency as well as the context in which the sports is played (team sports versus individual sports participation). We hypothesized that depressive and aggressive symptoms would be associated with increased peer rejection one year later, but less so for youth who frequently participate in sports. Given that individual sports have sometimes even been associated with an increase in problems, we also expected that this protective effect of sports participation might only be present for sports played with a team of peers rather than in individual sports. Potential moderating effects of participant's sex were also examined. Boys not only tend to engage more often in physical and competitive activities than girls, but they also prefer team sports such as football or ice hockey whereas girls more often practice individual sports such as dancing, gymnastics or horseback riding (Metsäpelto & Pulkkinen, 2012). Furthermore, boys attribute more importance to practicing sports, and report more social status benefits associated with being an athlete (Marsh, Gerlach, Trautwein, Lüdtke, & Brettschneider, 2007). Lastly, other findings suggest that sports participation is associated with a decrease in externalizing problems for boys, but not girls (Fredricks & Eccles, 2006). Together, these results suggest that the hypothesized protective effect of sports participation in regard to the link between depressive or aggressive symptoms and peer rejection may be only observed for boys.

These links were examined while considering potential confounding effects of family socioeconomic status (SES) and adolescents' athletic skills, both of which have been related to youngsters' sports participation as well as to their social standing in the peer group (Kamphuis et al., 2008; Lopez-Williams et al., 2005). We also controlled for adolescents' perceived social competence in an attempt to account for a potential selection effect. Indeed, it is possible that adolescents who feel less socially competent choose to participate in individual sports in order to avoid social interactions.



Moreover, we utilized a longitudinal design to predict *change* in peer rejection over a one-year period by controlling for initial (i.e., time 1) levels of peer rejection in the analyses. To this end, we also focussed on the transition from primary to secondary school (i.e., from grade 6 to grade 7). Although peer rejection has been found to be stable across different school contexts for some youth (Veronneau et al., 2010), the (mostly) new peer environment in secondary school can nevertheless afford a fresh opportunity for previously rejected youngsters to ameliorate their social standing. Focusing on this transition, where children move to a different social setting, enhances the likelihood that their new social standing is influenced mostly by personal characteristics rather than by a previously acquired negative social reputation. Young adolescents who can improve their socio-behavioral skills through sports may thus have an especially good chance to develop a positive relationship with their new peer group or to be perceived more positively by them. The transition to secondary school may therefore be a particularly sensitive period for buffering vulnerable adolescents against further peer rejection through engagement in sports activities.

## Method

### Sample

The 291 participants (50.5% girls) of this study were part of an original sample of 326 Caucasian adolescents from a small urban community in northern Québec, Canada. The original sample included all the children that were present the day of the data collection in each of the five schools in that city. The participants were evaluated in grade 6 (Time 1; *Mean* age = 11.47, *SD* = .55, *Min* = 10, *Max* = 13) and again, one year later, in grade 7. In grade 6, participants were distributed across five primary schools (with an average of 3 classes per school). In grade 7, they all converged into one single secondary school (with 15 classrooms in grade 7). In grade 6, children remained with the same classmates throughout the school year. To facilitate transition to secondary school, the city

decided to also keep children in a fixed group in grade 7. This enabled us to use in-class peer nominations for the data collections for both time 1 and time 2 (see description of measures below).

Of the 326 original participants at T1 in primary school, 35 (10.7%) did not take part in the second wave of data collection in secondary school, either because they were not in school on that day, because they did not have the signed consent form with them or because the family had moved.

Analyses revealed that participants in the final study sample were considered less aggressive than those lost through attrition ( $t = 2.69$ ,  $p = .01$ ). The two groups did not differ on any other T1 variables.

Fourteen percent of families reported an annual household income of less than \$20,000, 24% of families made between \$20,000 and \$40,000, 36% of families gained between \$40,000 and \$60,000 and 27% of families had an income above \$60,000. Mothers were on average 23 years old at the birth of their first child, while fathers were 26 years or older. Finally, 19% of mothers and 23% of fathers did not hold a high school diploma, whereas 13% of mothers and 16% of fathers had a university degree.

## Measures

**Socioeconomic status (SES).** At time 1, the primary care-giver (usually the mother) reported on their own and their spouse's occupational prestige and education level (in years of schooling), as well as the yearly household income. The item assessing occupational prestige consisted of 25 possible occupation choices with an associated "prestige weight" for each of them (Blishen, Carroll, & Moore, 1987). The five SES components were z-standardized and averaged to generate an overall SES variable (see Willms & Shields, 1996, for details).

**Perceived athletic and social competence.** At Time 1, participants completed the Self-Perception Profile for Children (SPPC; Harter, 1985). The Athletic Competence and the Social Acceptability subscales of the SPPC consist of six items each that reflect the respondent's perceived competence in the physical activity domain and in the social domain, respectively. Each item consists of two opposite statements (e.g. "Some youth wish they could be a lot better at sports" but "Other

youth feel they are good enough at sports”; “Some youth find it hard to make friends” but “Other youth find it’s pretty easy to make friends”). Participants chose the description that corresponded best to their self-perception and then specified whether it was “sort of true” or “really true” for them. Individual item scores, ranging from 1 to 4, were averaged to create a composite score representing the adolescent’s perception of his or her athletic abilities and of his or her social acceptance. The SPPC subscales scores have been shown to correlate positively with peer-, teacher-, and parent-ratings of youth’s competence (e.g. Cole, Jacquez, & Maschman, 2001; Van Den Bergh & Marcoen, 1999).

**Depressive and aggressive symptoms.** At Time 1, participants’ depressive and aggressive symptoms were assessed using peer nominations within the classroom based on items from the Pupil Evaluation Inventory (Pekarik, Prinz, Liebert, Weintraub, & Neale, 1976). In each class, a research assistant distributed a booklet to all students, with the names of everyone in the class listed on each page. On each page, participants were then asked to circle the names of up to three classmates who best fit the descriptive statement on that page. Two descriptive statements were used to assess depressive symptoms: “Those whose feelings are too easily hurt” and “Those who are unhappy or sad”. Three descriptive statements were used to assess aggressive symptoms: “Those who start a fight over nothing”, “Those who say they can beat everybody up”, and “Those who often get angry and hit others when they feel annoyed or threatened”. This last item, taken from the Reactive and Proactive Aggression Scale (Dodge & Coie, 1987), was added to specifically capture reactive aggression, which is known to be an important predictor of peer rejection (Poulin & Boivin, 2000). For each participant, the number of nominations received for a given item was calculated and z-standardized within class. Next, for each participant, the respective individual item scores were averaged to create an overall depressive symptoms scale (inter-item  $r = .43$ ) and aggressive symptoms scale ( $\alpha = .96$ ). Of note, although only few items were used to assess depressive and aggressive symptoms, even single-item peer nomination assessments tend to be highly reliable because the scoring is generated on the basis of

multiple respondents (e.g., Hodges, Malone, & Perry, 1997). Peer rated aggressive behavior correlates well with teacher-rated and self-rated aggression (Prinstein & La Greca, 2004). Peer-rated depressive symptoms has shown moderate correlations with self-ratings, but a much stronger correlation with teacher-rated depressive symptoms (Bandura, Pastorelli, Barbaranelli, & Caprara, 1999).

**Sports participation.** Participants' sports participation was assessed at Time 1 through self-reports, using a Likert-type 4-point scale (0 = I do not play sports, 1 = 1 to 3 hours per week, 2 = 4 to 6 hours per week, 3 = 7 or more hours per week). Six percent of adolescents reported not engaging in sports activities. Among the participants who reported practicing sports, 39% spent 1-3 hours per week in sports activities, 35% spent 4-6 hours per week, while 26% spent 7 or more hours practicing a sport. Each participant was also asked to indicate whether he or she mainly practiced their sport within a team context (either with an organized team or unorganized group of peers; 81.2%), or whether he or she mainly engaged in an individual sport (3.5%) or in sports with family members (15.3%). Individual sports and sports with family were combined into the individual context category. The sports context item (team sports vs. individual sports) was then combined with the sports participation frequency item to create two new variables: "Frequency of team sports participation" and "Frequency of individual sports participation". Each of these two new variables had values between 0 and 3. Specifically, children who engaged in team sports had values between 1 and 3 for the first new variable "Frequency of team sports participation" and a score of 0 for the second new variable "Frequency of individual sports participation". Conversely, children who reported engaging in individual sports received values between 1 and 3 for the second new variable "Frequency of individual sports participation" and a score of 0 for the first new variable "Frequency of team sports participation". Children who did not participate in any sports received a score of zero on both new "Frequency of sports participation" variables.

**Peer rejection.** Peer rejection at Time 1 and Time 2 was evaluated using the peer nomination technique described previously. All children in the class were asked to select the three classmates “they would most like to invite to their birthday party” and the three classmates “whom they would least like to invite to their birthday party.” The total number of received negative nominations was then calculated for each participant and z-standardized within classroom to create a total Liked-Least-score (LL) to indicate the level of peer rejection. The same procedure was used for the number of positive nominations to create a total Liked-Most-score (LM), which indicated the level of popularity among peers. Because Liked-Least-scores were significantly correlated with Liked-Most-scores (see Table 1), Liked-Most-scores were statistically controlled in the analyses predicting to peer rejection.

### **Procedure**

All instruments were administered in French. Questionnaires that were originally written in English were translated once into French and then, a second time, back into English. Bilingual judges performed a semantic similarity comparison between the original and the back-translated versions. This procedure was repeated until the translation of each item was considered satisfactory. Mothers completed the questions regarding family SES at home. For the other measures, participants spent 1 hour of classroom time answering the questionnaires. Trained research assistants administered and collected the questionnaires. After informing students about the purpose of the study, they were told that all answers would be confidential and that they did not have to answer any of the questions if they did not want to. The students were encouraged to keep their answers confidential and not to talk with classmates about their answers. The research assistants remained present while students filled out the questionnaires to answer any questions related to the study. Teachers were asked to leave the classroom during the assessment time to emphasize that students’ answers would not be revealed to their teachers. Parental active written consent and adolescents’ verbal assent was obtained each year for all participants. Participants received no incentives. The research questions and instruments were

submitted to, and approved by the University of Montreal's Institutional Review Board and the school board administrators.

### **Analyses**

Descriptive statistics and bivariate correlations between the study variables were examined (see Table 1). Depressive and aggressive symptoms were log-transformed to reduce skewness and kurtosis prior to analyses. Next, hierarchical linear regressions were performed to assess the additive and interactive effects of depressive or aggressive symptoms and sports participation at Time 1 on peer rejection at Time 2. Perceived athletic competence, perceived social acceptance, SES, peer popularity, and peer rejection at T1 were included as control variables. Further, participant's sex, depressive and aggressive symptoms, and frequency of sports participation (for both contexts) at Time 1 were included as the main independent variables of interest in Model 1.

Interactive terms were added in subsequent alternate model steps. Specifically, in Model 2a, the two-way interactions 'depressive symptoms x team-sports participation', 'depressive symptoms x sex', and 'team-sports participation x sex' as well as the three-way interaction 'depressive symptoms x team-sports participation x sex' were added. In alternate model steps, the two-way interactions 'depressive symptoms x individual sports participation', 'depressive symptoms x sex', and 'individual sports participation x sex' as well as the three-way interaction 'depressive symptoms x individual sports participation x sex' were added in Model 2b. Complementary model steps were used to test two- and three-way interactions involving aggressive symptoms and team sports participation (Model 2c) and to test two- and three-way interactions involving aggressive symptoms and individual sports participation (Model 2d). All controls and main independent variables remained the same in each model. Because the benefits of sports may diminish at very high frequencies of sports participation, we also examined potential curvilinear main and moderating effects of the participation variables. To this end, we tested a

supplemental model where we added a quadratic term for each context of sports participation as well as additional interaction terms involving these quadratic sports participation variables.

All variables except sex were z-standardized prior to creating the interaction terms to aid interpretability of regression coefficients. Analyses were performed using SPSS Version 21 and cases with occasional missing data (5.78%) were estimated using multiple imputations (i.e., 20 sets of 30 iterations).

## **Results**

### **Bivariate Correlations**

Bivariate correlations (see Table 1) revealed that peer rejection scores were fairly stable from Time 1 to Time 2. Higher depressive and aggressive symptoms at Time 1 were significantly associated with more concurrent (Time 1) and future (Time 2) peer rejection. Frequent participation in individual or in team sports at Time 1 were not associated with concurrent (Time 1) or future (Time 2) peer rejection. Frequent participation in team sports at Time 1 was associated with higher concurrent levels of aggressive symptoms. Coming from a higher SES family at Time 1 was associated with less concurrent and future peer rejection as well as lower levels of depressive symptoms at Time 1, whereas being a girl was associated with less peer rejection at Time 1 and Time 2, lower levels of aggressive symptoms at Time 1, lower perceived sports competence at Time 1 and less team sports participation. Higher perceived sports competence at Time 1 was associated with higher levels of self-perceived social competence, lower depressive symptoms, higher aggressive symptoms and more frequent team sports participation at Time 1, as well as with less peer rejection at Time 2. Finally, higher levels of self-perceived social competence were associated with lower levels of depressive symptoms at Time 1, and less concurrent (Time 1) and future (Time 2) peer rejection.

Although socioeconomic status (SES) was correlated with several other study variables, it was not a significant predictor of peer rejection once it was included in the subsequent multiple regression

models. SES was therefore omitted from all analyses for parsimony. Moreover, the supplementary multiple regressions examining both linear and quadratic terms of sports participation showed no evidence of curvilinear effects. Thus, for the sake of brevity, only the analyses assessing linear effects are presented below.

### **Predictions of Peer Rejection in Grade 7: Main Effects**

As shown in Table 2, the results from Model 1 revealed that adolescents' level of peer rejection was relatively stable over the assessed one-year period ( $B = .31, p < .001$ ). Sex of the participant ( $B = -.15, p = .11$ ) was unrelated to change in peer rejection. High perceived social competence was associated with a decrease in peer rejection at Time 2 ( $B = -.18, p = .002$ ), while high levels of aggressive symptoms at Time 1 were associated with increased peer rejection at Time 2 ( $B = .13, p = .03$ ). However, perceived athletic competence and depressive symptoms at Time 1 were both unrelated to changes in rejection levels ( $B = -.02, p = .71$ ; and  $B = .06, p = .33$ , respectively). Frequency of both team sports participation at Time 1 and individual sports participation at Time 1 were not predictive of a change in peer rejection ( $B = .05, p = .43$ ; and  $B = -.04, p = .52$ , respectively). The adjusted  $R^2$  for Model 1 was .32.

### **Predictions of Peer Rejection in Grade 7: Interactions Involving Depressive Symptoms**

**Team sports participation.** Model 2a included the interaction terms regarding frequency of team sports participation, while controlling for frequency of individual sports participation. The adjusted  $R^2$  for Model 2a was .38. As can be seen in Table 2, there was a significant two-way interaction between sex and depressive symptoms ( $B = -.72, p < .001$ ), a significant two-way interaction between frequency of team sports and depressive symptoms ( $B = -.14, p = .05$ ), as well as a significant three-way interaction between frequency of team sports, sex and depressive symptoms ( $B = .22, p = .04$ ). Probing of this three-way interaction revealed that the two-way interaction between depressive symptoms and frequency of team sports participation was significant for boys ( $B = -.14, p =$



.05) but not for girls ( $B = .08, p = .31$ ). An illustration of the interaction for boys is provided in Figure 1. As can be seen, higher levels of depressive symptoms were associated with increased peer rejection for boys who did not participate in team sports ( $B = .48, p < .001$ ). In contrast, when boys often engaged in team sports, higher depressive symptoms no longer predict an increase in peer rejection one year later ( $B = .09, p = .46$ ).

**Individual sports participation.** Model 2b included the interaction terms regarding frequency of individual sports participation, while controlling for frequency of team sports participation. The adjusted  $R^2$  for Model 2b was .37. The results showed a significant two-way interaction between sex and depressive symptoms ( $B = -.27, p = .02$ ), a significant two-way interaction between frequency of individual sports and depressive symptoms ( $B = .15, p = .03$ ), as well as a significant three-way interaction between frequency of individual sports, sex and depressive symptoms ( $B = -.27, p = .02$ ). Probing of this three-way interaction again revealed that the two-way interaction between depressive symptoms and individual sports participation was significant for boys ( $B = .15, p = .03$ ) but not for girls ( $B = -.12, p = .18$ ). An illustration of the interaction for boys is provided in Figure 2. As can be seen, depressive symptoms were associated with a significant increase in peer rejection for all boys. However, this predictive effect of depressive symptoms was even stronger for boys who often took part in individual sports ( $B = .83, p = .003$ ) than for boys who did not participate in individual sports ( $B = .21, p = .02$ ).

### **Predictions of Peer Rejection in Grade 7: Interactions Involving Aggressive Symptoms**

None of the two-way and three way interactions involving aggressive symptoms were significant. Thus, the observed predictive effect of aggressive symptoms on increased peer rejection from Time 1 to Time 2 was independent of adolescents' frequency and type of sports participation or sex.

## **Discussion**

The current study was the first to assess the potential moderating effect of sports participation on the longitudinal associations between depressive and aggressive symptoms, on the one hand, and peer rejection, on the other hand, over a one-year period. To this end, we focused on the transition from primary to secondary school, which could present a critical developmental window for a potential change in peer rejection levels for at-risk youth. These associations were examined while controlling for family SES, as well as adolescents' initial level of peer rejection and perceived athletic competence at Time 1. In line with findings from other studies, adolescents' level of peer rejection remained relatively stable even after the transition from primary to secondary school (Veronneau et al., 2010). Given that the majority of classmates in secondary school were most likely new and unknown peers, these results lend support to the idea that peer rejection is a relatively stable phenomenon for many youngsters, even when changes occur in the social context. This stability across contexts suggests that peer rejection is not only a result of negative social reputation, but it can also be explained by other factors, including individuals' depressive and aggressive symptoms. Offering avenues that help youngsters improve their behavioral and social skills may thus be especially critical during the school transition, when social hierarchies need to be renegotiated. The move from small primary school settings with well-established social networks into much larger secondary schools may afford especially rich opportunities for at-risk youth to develop positive relationships with age mates and thus improve their social standing in the peer group. In line with this notion, our findings suggest that sports participation may be a promising avenue to help at-risk youth to achieve this goal. Specifically, the frequency of participation in sports interacted with depressive symptoms in predicting peer rejection levels one year later, albeit differently for team sports and individual sports, and only in boys. In contrast, frequency of sports participation did not moderate the link between aggressive symptoms and peer rejection for either sex group.

### **Depressive Symptoms and Peer Rejection: Moderating Effects of Sports Participation**

Our results are in line with previous studies showing that internalizing symptoms are a significant risk factor of problematic peer relations (Bolger & Patterson, 2001; Brendgen et al., In press). This association, however, was only observed in boys, and depended on their level of participation in team or individual sports. In contrast, depressive symptoms were not associated with a significant increase in peer rejection for girls, regardless of their sports participation (or lack thereof). Depressive symptoms include behaviors such as increased sensitivity, emotional reactivity and social withdrawal (Coyne, 1976b). Why do these symptoms only seem to taint peers' attitudes towards boys but not girls? One explanation could be that depressive symptoms, such as rumination, are more acceptable for girls than for boys (Broderick & Korteland, 2002). Both male and female adolescents report being aware of the gender-based social norms that boys are "expected to be "tough" or "macho" and to deny or "not feel" emotion" (Wisdom, Rees, Riley, & Weis, 2007). These gender-role expectations could lead to more negative reactions from peers when non-gender-normative behavior is displayed. In line with this notion, sensitive or withdrawn boys have been shown to report more loneliness and to perceive themselves as less socially competent compared to girls (Rubin, Chen, & Hymel, 1993). Girls also tend to socialize in smaller and more close-knit groups of friends, whereas boys often socialize in larger and somewhat looser peer groups (Sandstrom & Coie, 1999). Boys' depressive symptoms may therefore be observed by a potentially larger number of peers and thus more readily influence their social standing in the peer group as a whole.

The longitudinal association between boys' depressive symptoms and their level of rejection by the peer group, however, depended largely on the extent to which they participated in team or individual sports. Indeed, even high levels of depressive symptoms did not predict increased peer rejection for boys who often participated in team sports. A very different picture emerged for boys with elevated depressive symptoms who often participated in individual sports, however, who became even more rejected over time. Since the benefit of sports participation for vulnerable youth was only

observed in the team sports context, this effect cannot be explained merely by biological effects of physical activity on mood and behavior, nor by improved athletic abilities that may enhance social standing. The social nature of team sports requires that participants focus on cooperation and compromise, in order to achieve the common goal shared by all members of the team. Several studies have indeed shown that participation in team sports, specifically, is associated with improved emotion regulation, communication and social skills (Denault & Poulin, 2016; Hansen, Skorupski, & Arrington, 2010), which have been found to be lacking in many youth with depressive symptoms (Flouri & Sarmadi, 2016; Garnefski et al., 2005; Perren & Alsaker, 2009). Dealing with losses or challenges as a group may teach youths with depressive symptoms effective strategies to regulate their negative emotions by observing how their peers succeed at this task. Finally, being with like-minded peers who share the same interests may foster a sense of belonging that is often lacking in individuals with depressive symptoms (Newman et al., 2007). Indeed, the present findings resemble those from another study showing that young adolescents who participate in extracurricular group activities become less rejected over time (Sandstrom & Coie, 1999). The authors argued that vulnerable youths who are in frequent contact with socially skilled peers may not only be provided with opportunities to improve their own social behavior, but also to forge new alliances with others, which may ultimately help improve their social standing among peers.

Given the protective moderating effect of team sports participation, why did frequent participation in individual sports exacerbate – rather than buffer against – the link between depressive symptoms and increased peer rejection in boys? This finding actually replicates those from other studies showing that individual sport participation is associated with an increase in depressive symptoms and an increase in social anxiety (Dimech & Seiler, 2011; Miller & Hoffman, 2009; Nixdorf et al., 2016). Compared to athletes that participate in team sports, individual sport athletes show attribution styles that are more internal, stable and global (Nixdorf et al., 2016). When facing negative

events (such as failures or stress), individual sport athletes' internalized attribution style may lead to more negative affect such as depressed moods or anxious thoughts. This increase in anxious and depressive symptoms may, in turn, have contributed to the worsening of peer rejection observed in the present study among boys who participated in individual sports.

### **Aggressive Behavior and Peer Rejection: No Moderating Effects of Sports Participation**

After considering the sex-specific interactions between depressive symptoms and sports participation, the unique role of aggressive symptoms in predicting peer rejection also merits a brief discussion. In line with previous research showing that peer-nominated aggressive behavior confers increased risk of peer rejection (Prinstein & Cillessen, 2003), our study revealed that this is true even when controlling for depressive symptoms and a host of other risk factors. Contrary to the findings for depressive symptoms, however, this link was not moderated by either context of sports participation for boys or girls. While this finding could indicate that aggressive behavior is deemed more unacceptable than depressive symptoms by peers, the modest effect size of aggressive behavior is incompatible with this notion. Rather, it is possible that aggressive adolescents do not benefit from participating in team sports in the same ways individuals with depressive symptoms do. Indeed, team sports are often viewed as a competitive environment where some degree of aggression may be valued and even admired (Kreager, 2007). Thus, if aggressive behaviors are regularly reinforced by teammates, coaches and spectators, or if they are perceived as an asset that helps achieve success, aggressive youngsters who participate in team sports may have no incentive to change their behavior. Furthermore, the team context in the present study was not limited to organized settings, but also included instances where groups of peers engage in unstructured, unsupervised team-sports (e.g., playing hockey with a regular group of peers on near-by public ice rinks). In the latter condition, a coach (or other instructor) that could curb aggressive behavior may often not be present, and aggressive youngsters may thus not be presented with sufficient opportunities for learning alternative behavioral strategies.

### **The Overscheduling Hypothesis**

Although some studies have shown that sports participation may not be beneficial if pursued at very high frequency, our results do not support this hypothesis. However, as previously mentioned, the overscheduling effect appears to manifest itself only for the few participants with extreme levels of participation (i.e. at around 20 hours per week). Since the highest frequency choice for our participants was “7 or more hours per week”, our data may have precluded us from detecting any potential curvilinear effect of sports participation. Indeed, previous studies suggest that most youths spend between 5 and 8 hours per week in all extracurricular activities combined and that only very few (i.e., 3-6%) children participate in extracurricular activities at an even higher frequency (Fredricks, 2012; Mahoney et al., 2006). Therefore, even if a few of the participants who chose the “7 or more hours per week” response option engaged in sports for more than 20 hours per week and suffered negative consequences as a result of their sport participation, their number may not have been sufficient to yield a statistically significant curvilinear effect in addition to the general positive effect experienced by the rest of the frequent sports participants. The overscheduling hypothesis may thus only apply to exceptional athletes who train for and compete at national or international levels of their discipline.

### **Sports Participation in Girls**

Somewhat unexpectedly, frequent participation in either sport context had no main or moderating effect on peer rejection for girls. This result might seem surprising, as several studies found that sport participation was associated with decreased depressive symptoms and increased self-esteem among girls (Bowker, 2006; Gore, Farrell, & Gordon, 2001). However, peer groups are known to enforce societal gender roles (Leaper & Friedman, 2007) and sport participation is still perceived by many as an activity that emphasizes more masculine traits like dominance and competitiveness (Bowker, 2006). Girl athletes may thus be perceived as non-conforming to gender-role expectations, which may negatively impact their social status among peers (Daniels & Leaper, 2006). These attitudes are

changing, however, and sports participation is becoming a more and more socially acceptable activity for girls (Daniels & Leaper, 2006). Future studies may therefore be able to identify more benefits associated with girls' participation in sports.

### **Strengths and Limitations**

The present study is the first to investigate the moderating role of sports participation on the longitudinal link between depressive and aggressive symptoms and adolescents' peer rejection among peers. In doing so, we controlled not only for previous levels of peer rejection but also for other potentially confounding variables, including self-perceived athletic and social competence. Another strength of the study was the use of peer nominations to measure not only peer rejection but also depressive and aggressive symptoms. The advantage of using external sources for evaluating aggressive behavior has been emphasized to avoid bias due to social desirability, a lack of self-awareness or even active denial (Österman et al., 1994). Peer reports are ideal in this context, as children spend the better part of the day in the company of peers and their aggressive behavior also mostly targets other children of similar age. Peers' assessments of depressive symptoms are also especially useful for assessing the outwardly observable expression of depressive symptoms, which should have a greater impact on peers' acceptance or rejection of an individual than the individual's internal state. Peer evaluations have also been found to correlate well with teacher-rated depressive symptoms (Bandura et al., 1999).

The present study also aimed to address some of the limitations regarding the measurement of sports participation in previous research. Indeed, a meta-analysis of the relevant literature (Eime, Young, Harvey, Charity, & Payne, 2013) showed that many previous studies either a) failed to differentiate between participation in team and individual sports, or b) treated sports participation as a categorical variable rather than assessing the frequency of sports participation, or c) compared only team sports against no-sport participation. To address these issues, our measure of sports participation

included information about both the frequency and the social context in which the sport was played. In light of the differential moderating effects of team versus individual sports observed in the present study, this distinction seems to be critical when evaluating the potential benefits of sports for improving vulnerable youngsters' peer relations.

The current study also has several limitations. First, it is important to note that participants were not randomly assigned to a particular context of sports participation, which raises the issue of self-selection. Indeed, it may be that children who choose to enroll in team sports differ on several important characteristics compared to the ones who choose individual sports. Although we controlled for self-perceived social and athletic competence, several other confounded variables may also be at play. For example, there is some evidence that individuals who choose to participate in team sports score higher on extraversion compared to those who opt for individual sports (Eagleton, McKelvie, & de Man, 2007). Extraversion has been linked to increased popularity (Ilmarinen, Vainikainen, Verkasalo, & Lönnqvist, 2015), but was not controlled in this study.

We also did not assess whether our participants were engaged in other extracurricular activities along with their sports. Although youths who only play sports do better on various developmental outcomes than their peers who do not practice sports, those who are involved in several different activities seem to do best (Linver, Roth, & Brooks-Gunn, 2009; Zarrett et al., 2009; Zarrett et al., 2016). Adolescents who are engaged in other activities in addition to team sports may thus experience the strongest decrease in peer rejection over time.

We also lacked information about whether participants' sports participation took place in an organized setting or not. Previous studies have usually either considered only organized sports, or compared categorical groups of participants in organized team sports versus organized individual sports versus informal sports (without distinguishing between individual or team context for the latter and without assessing frequency of sports participation) (for a review, see Eime et al., 2013). Organized



sports is defined as having a regular participation schedule, as being rule-guided, under adult supervision, and that entail a social commitment (Kjønniksen, Anderssen, & Wold, 2009). These features may enhance the benefits of sports participation for social development. Similar characteristics may also apply to informal sports, however. Thus, parents can supervise a game of street hockey that has well-established rules. Furthermore, these meet-ups could be organized on a daily basis and participants may feel quite committed to their team, even if it is informal in nature. There is also some evidence that the potential benefits associated with informal sports increases with age, whereas benefits associated with organized sports tend to decrease (Pedersen & Siedman, 2004; Tremblay & Whims, 2003). Thus, in addition to measuring the frequency of participation in team sports and individual sports, future research should assess whether these activities occur in an organized or in an informal setting.

Furthermore, given that this study focused on the transition between elementary and secondary school, the buffering effects of sports participation might only be present during this very limited developmental window. The transition into a new environment may present vulnerable youngsters with the opportunity to forge new social relationships and hence improve their social status. After the first year in secondary school, however, adolescents' social reputation may crystallize again and sports participation may not have the same moderating effect as identified in the present study. Moreover, the results pertaining to depressive symptoms may not hold for younger age groups, since depressive symptoms play a lesser role in predicting peer relationship problems in childhood than in adolescence (Brendgen et al., In press). It should also be noted that our study was based on a community sample whose personal characteristics (including their depressive symptoms) were assessed by their peers. The results may not apply to adolescents with a clinical diagnosis of depression. Although studies have shown that the effects of physical activity on depressive symptoms do not appear to depend on the severity of the symptoms (Daley, 2008), it may be more difficult to get youth suffering from clinical

depression to engage in sporting activities on a frequent and regular basis. The present findings should thus not be generalized beyond the scope of this study.

### **Conclusions**

Despite these limitations, our findings offer new insights into the particular role of team sports especially for depressive boys' social development. First, participation in team sports may protect boys who suffer from depressive symptoms from an increase in peer rejection. By the same token, however, the same boys may risk a further increase in peer rejection if they frequently engage in individual sporting activities (either alone or with their families) instead of with same-age peers. While in need of replication, these results may have useful implications for the prevention of peer rejection and its associated consequences in vulnerable boys. A team sports activity prevention program that targets youth suffering from depressive symptoms may be fairly easy to implement at a relatively low-cost and without the risk of stigmatization. In this context, Smith (2003) has provided numerous suggestions on how sports programs can foster healthy development while also including the benefits associated with positive peer relations.

Future research should also attempt to further pinpoint the mechanisms responsible for the protective effect of team sports participation. Team sports participation may protect vulnerable youngsters from subsequent peer rejection through, for example, an improvement in social skills (such as conflict resolution, self-affirmation, or prosocial skills), emotion regulation, increased tolerance to negative events, or a change in attribution style. Moreover, future studies could assess not only the frequency of team sports participation but also the level of competitiveness and the team climate (task cohesion, quality of the coaching staff, etc.). Lastly, it may be useful to consider the social context as a continuum rather than as a dichotomy of individual versus team sports. An example of such a conceptualization was provided by Nixdorf and colleagues (2016), who classified sports as a) a single performance (e.g., running in a race), b) added performance (e.g., performing in a relay race), c)

coactive performance (e.g., competing simultaneously such as in a rowing team), and d) interactive performance (e.g., playing soccer as a team). Such a continuum-based conceptualization might further clarify the potential benefits associated with different context of sports participation. Together, the findings from this research may help guide parents as well as educators and clinicians in their efforts to prevent negative social consequences of adolescents' aggressive behavior and depressive symptoms and thus a potential worsening of their symptoms.

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Table 1

*Descriptive Statistics and Bivariate Correlations*

Measure	1	2	3	4	5	6	7	8	9	10	11
1. Socio-Economic Status											
2. Sex <sup>a</sup>	-.07										
3. Peer Rejection T1	-.19**	-.24**									
4. Peer Acceptance	.19**	-.04	-.43**								
5. Social Competence	.07	.07	-.27**	.21**							
6. Athletic Competence	.04	-.25**	-.06	.05	.40**						
7. Depressive Symptoms	-.16**	-.03	.52**	-.34**	-.32**	-.16**					
8. Aggressive Symptoms	.04	-.55**	.18**	.11	.05	.25**	-.07				
9. Individual Sport Participation	.03	.03	.07	-.04	-.11	-.04	.05	-.11			
10. Team Sport Participation	.08	-.13*	-.04	.09	.21**	.30**	-.02	.19**	-.49**		
11. Peer Rejection T2	-.13*	-.22**	.49**	-.29**	-.33**	-.09	.32**	.18**	.10	-.10	
<i>Minimum</i>	-2.35	0	-1.66	-2.06	1.00	1.17	-0.75	-1.16	0.00	0.00	-1.47
<i>Maximum</i>	2.24	1	3.75	2.89	4.00	4.00	4.06	3.90	3.00	2.00	3.93
<i>M</i>	0.05	-	-0.01	0.00	2.93	2.98	-0.07	0.07	1.49	0.20	-0.01
<i>SD</i>	0.83	-	0.99	1.00	0.64	0.63	0.76	1.03	1.10	0.53	0.99
<i>Skewness</i>	0.04	-	1.710	0.42	-0.34	-0.57	2.61	2.05	0.02	2.64	1.57
<i>Kurtosis</i>	-0.09	-	2.596	-0.39	-0.66	-0.02	8.28	3.78	-1.31	5.75	2.56

Note. <sup>a</sup>(0 = boys; 1 = girls). \* =  $p < .05$ , \*\* =  $p < .01$ .

Table 2

*Hierarchical Multiple Linear Regression Predicting Peer Rejection in Grade 7*

<i>Predictors</i>	<i>B</i>	<i>SE B</i>	<i>t</i>	<i>p</i>
<b>Model 1</b>				
Peer Rejection (Grade 6)	.310***	.066	4.731	.000
Peer Acceptance	-.114	.057	-2.017	.04
Athletic Competence	-.022	.061	-.362	.72
Social Competence	-.181**	.058	-3.101	.002
Sex <sup>a</sup>	-.150	.122	-1.232	.22
Depressive Symptoms	.060	.062	.968	.33
Aggressive Symptoms	.131*	.062	2.132	.03
Frequency Of Team Sports Participation	.049	.064	.777	.44
Frequency Of Individual Sports Participation	-.044	.067	-.647	.52
<b>Model 2a</b>				
Depressive Symptoms X Team-Sports	-.136*	.070	-1.942	.05
Depressive Symptoms X Sex	-.723***	.195	-3.714	.000
Team-Sports X Sex	.178	.104	1.706	.09
Depressive Symptoms X Team-Sports X Sex	.221*	.111	1.994	.04
<b>Model 2b</b>				
Depressive Symptoms X Individual Sports	.153*	.072	2.111	.03
Depressive Symptoms X Sex	-.276*	.116	-2.377	.02
Individual Sports X Sex	-.050	.110	-.452	.65
Depressive Symptoms X Individual Sports X Sex	-.271*	.116	-2.339	.02
<b>Model 2c</b>				
Aggressive Symptoms X Team-Sports	-.050	.059	-.838	.40
Aggressive Symptoms X Sex	.269	.206	1.307	.19
Team-Sports X Sex	-.183	.155	-1.181	.24
Aggressive Symptoms X Team-Sports X Sex	-.036	.221	-.162	.87
<b>Model 2d</b>				
Aggressive Symptoms X Individual Sports	.029	.073	.402	.69
Aggressive Symptoms X Sex	.233	.193	1.203	.23
Individual Sports X Sex	.143	.177	.810	.42
Aggressive Symptoms X Individual Sports X Sex	.152	.245	.619	.54

*Note.* <sup>a</sup> (0 = boys; 1 = girls). Pooled estimates of regression parameters are provided. Adj. R<sup>2</sup> : Model 1 =.32, Model 2a =.38, Model 2b =.37, Model 2c =.32, Model 2d =.33; \* = p <.05, \*\* = p <.01, \*\*\* = p <.001.

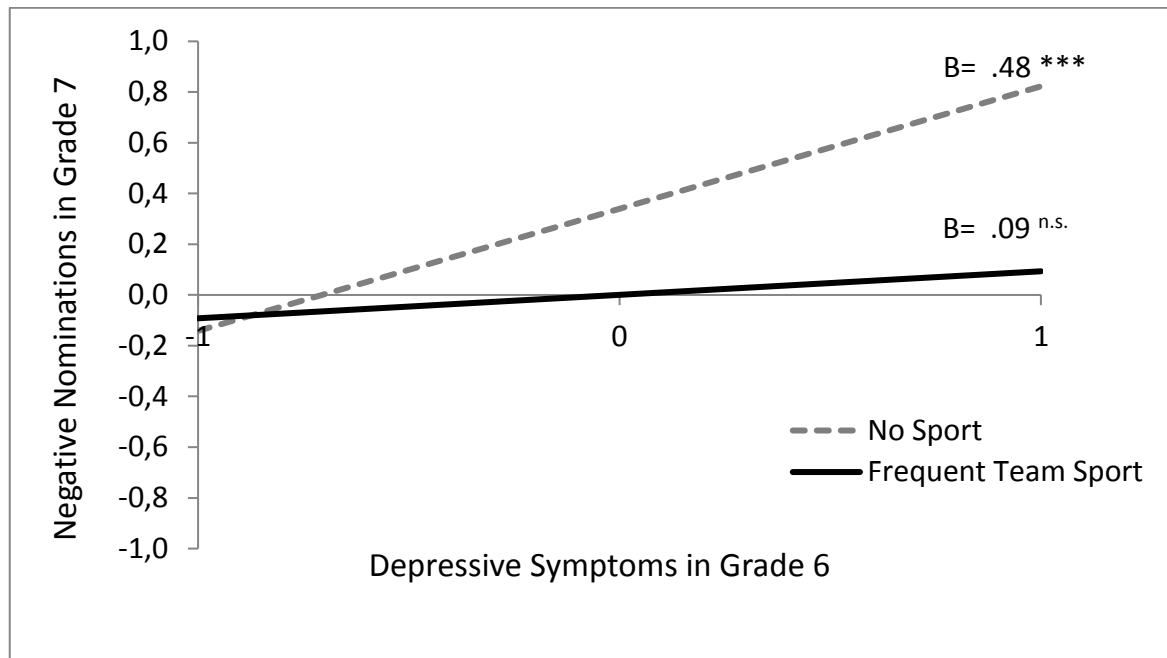


Figure 1. Boys' change in peer rejection levels from grade 6 to grade 7, depending on their grade 6 depressive symptoms and participation in team sports.

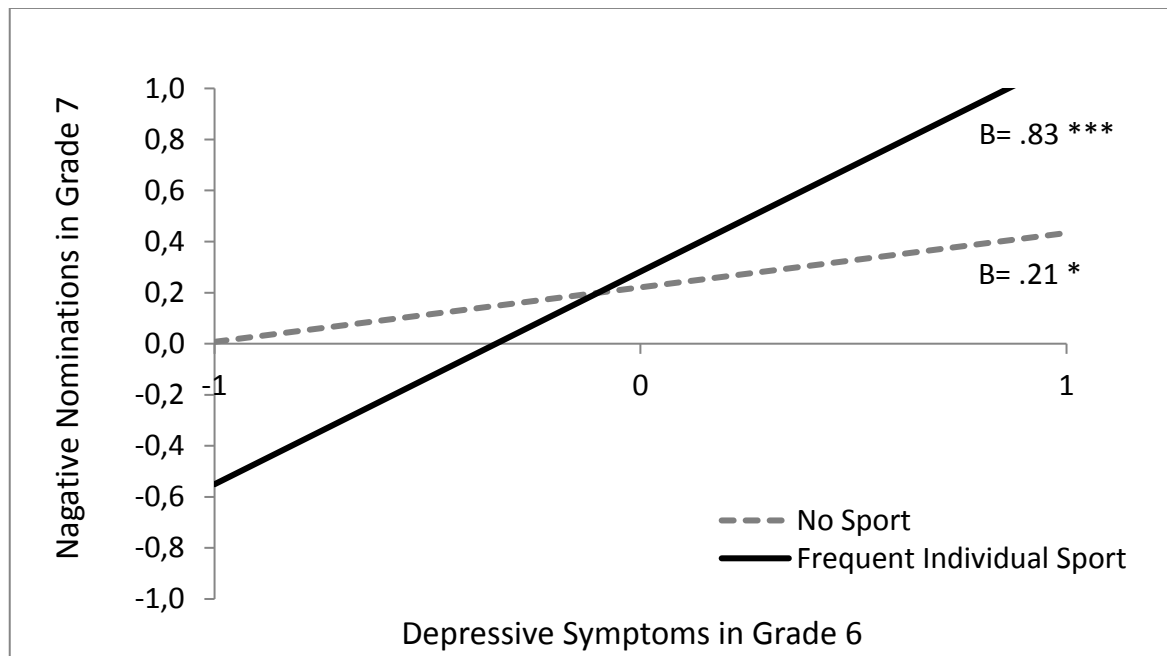


Figure 2. Boys' change in peer rejection levels from grade 6 to grade 7, depending on their grade 6 depressive symptoms and participation in individual sports.