Abstract

Although participation in organized sports activities is associated with psychosocial development, less is known about how the sports context contributes to positive adjustment outcomes. In the current study, we expected peer support to explain this association. In addition, to investigate whether sports involvement is beneficial for socially anxious youth, we explored if social anxiety moderates these associations. Cross-sectional data (N=679) was used to test our hypotheses. The results showed that peer support significantly mediated the relationship between organized sports participation and youth adjustment. On the other hand, social anxiety did not moderate the relationship between organized sports participation and positive adjustment. In conclusion, the findings suggest the importance of enabling and promoting peer relations within the organized sports context.

Keywords: Organized sports participation, social support, peer support, adjustment, depression, loneliness, self-esteem, subjective well-being, social anxiety.

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Participation in Organized Sports and Youth Adjustment: Mediating Role of Peer Support

Sports is a common free time activity for youth in Western societies. Around 71% of Swedish adolescents participate in an organized sports activity on a weekly or more frequent basis (Statistiska centralbyrån, 2016). Sports participation is associated with a range of physical, cognitive and psychosocial benefits. One important reason for the positive effects of sports is due to increased physical activity. Benefits of physical activity include lower risk of heart disease, hypertension and diabetes (Oguma & Shinoda-Tagawa, 2004; Shephard et al., 2004), lower body fat percentage (Wijtzes et al., 2014), and improved muscle strength and skeletal density (Herrmann et al., 2015). Furthermore, physical activity improves motor development skills such as object control and locomotor skills (Henrique et al., 2016). There has also been evidence suggesting benefits of sports and physical activity in cognitive development. For example, physical activity and sports participation has been linked to improved academic performance (Eccles & Barber, 1999; Dwyer, Sallis, Blizzard, Lazarus, & Dean, 2001; Van Boekel, et al., 2016), improved executive functioning (Davis et al., 2011), and improved memory recall and processing speed (Zhu et al., 2014). In sum, there is clear evidence demonstrating the physical and cognitive benefits of physical activity for people of all ages.

In the psychosocial domain, benefits of physical activity are typically tied to organized sports activities (Fletcher, Nickerson, & Wright, 2003). An organized sport activity for youth is defined by Fletcher and colleagues (2003) as “organized by an adult leader around a specific goal”. In addition, organized sports activities and structured activities in general usually consist of regularly scheduled meetings and skill-building activities (Persson, Kerr, & Stattin, 2007; Özdemir & Stattin, 2012). For youth, organized sports activities tend to be more beneficial than unstructured activities, where youth spend time alone or with peers,
because the adult presence can prevent victimization by peers and enable positive social interactions (Fletcher et al., 2003; Perron et al., 2012).

**Organized Sports Involvement and Youth Adjustment**

Numerous studies have examined how participation in organized sports activities are related to both negative and positive indicators of youths' psychological adjustment. Several studies found that youth who participated in organized sports activities had fewer psychological symptoms such as lower reported levels of depressive symptoms than those who did not participate in sports (Boone & Leadbeater, 2006; Fox, 1999; Gore, Farrell, & Gordon, 2001; Sanders, Field, Diego, & Kaplan, 2000). More importantly, Özdemir and Stattin (2012) found that youth who consistently took part in organized sports activities displayed lower depressive symptoms over time. Also, those who started playing sports decreased in depressive symptoms over time compared to those who were not part of sports activities, and those who dropped out of sports. In addition to depression, existing literature also suggest that sports-participating youth experience less problems with interpersonal relations and social contact. Specifically, lower rates of loneliness are reported by sports-participating children in grades 1 to 6 (Page, Frey, Talbert, & Falk 1992) and later in adolescence (Haugen, Säfvenbom, & Ommundsen, 2013). In terms of positive adjustment indicators, several studies link sports involvement to youth perceiving themselves as more competent and of higher value (Fox, 1999; Sonstroem, 1997). In fact, adolescents involved in sports reported higher self-esteem than non-involved youth at competitive and elite levels (Findlay & Bowker, 2009), in urban settings (Pedersen & Seidman, 2004), and in both team and individual sports (Slutzky & Simpkins, 2009). Adding to the evidence, a longitudinal study by Özdemir & Stattin (2012) found that sports-involved youth maintained high levels of self-esteem over time, while dropouts and non-involved youth reporter gradual declines in their self-esteem. Lastly, a few studies show that youths' sports involvement has been linked...
to the overall satisfaction of their life and higher reported subjective well-being (Ruseski, Humphreys, Hallman, Wicker, & Breuer, 2014; Valois, Zullig, Huebner, & Drane, 2004). From a developmental perspective, these psychological adjustment indicators in adolescence may predict the risk for adult onset of mental health problems and overall functioning (American Psychiatric Association, 2013; Barlow & Durand, 2015; Diener, 2000; von Soest, Wichstrøm, & Kvalem, 2016).

Contrary to the large literature suggesting positive outcomes of sports participation, some studies highlight negative outcomes associated with youth participation in organized sport. For example, several studies found that youth who participate in sport tend to drink more (Barber, Eccles, & Stone, 2001; Eccles & Barber, 1999; Eccles, Barber, Stone, & Hunt, 2003). Other negative outcomes are increased engagement in risk-taking activities, negative peer interactions, and potential negative impact of heightened parental expectations related to sport outcomes (Collins & Barber, 2005; Holt, Sehn, Spence, Newton, & Ball, 2012; Steiner, McQuivey, Pavelski, Pitts, & Kraemer, 2000). Some of these negative outcomes can be explained by sport culture being competitive and alcohol-positive. Barber and colleagues (2001) state that college athletes in the U.S. tend to have a social network with friends who drink more. Adolescence is a time marked by identity formation and peer group formation and adolescents may therefore be susceptible to peer pressure (Eccles & Barber, 1999). The findings concerning alcohol use may represent specific cultural norms about drinking rather than global characteristics of sport involvement. Despite these few negative outcomes, youth are likely to experience a wide range of benefits when participating in organized sport.

**Peer Relationships and Youth Adjustment**

Making and developing friendships in adolescence is another important aspect that contributes to specific domains of adjustment. Studies on peer relations and youth adjustment focus on different aspects of peer relationships such as peer attachment, friendship quality,
positive peer relations, time spent with peers, and peer acceptance. First, youth with stronger peer attachment reported lower levels of depression (Gorrese, 2016; Li, Albert, & Dwelle, 2014). Additionally, peer attachment has been associated with higher self-esteem in general (Li et al., 2014; Mota & Matos, 2013), as well as in the school context (Millings, Buck, Montgomery, Spears, & Stallard, 2012; Sarkova et al., 2014). In fact, a recent meta-analysis of 24 studies by Gorrese & Ruggieri (2013) found peer attachment and global self-esteem to be consistently positively related to each other (r = .27). Second, in a cross-sectional study, adolescents with high friendship quality and quantity had lower rates of depression and loneliness (Spithoven et al., 2017). Third, having positive peer relationships in school is associated with less depression and anxiety (Millings et al., 2012; Sarkova et al., 2014). Adolescents with positive peer relations also report higher subjective well-being (Goswami, 2012; Suldo, Gelley, Roth, & Bateman, 2015). Fourth, time spent with friends and peer acceptance is positively associated with subjective well-being (Rubin, Evans, & Wilkinson, 2016; Oberle, Schonert-Reichl, & Thomson, 2010).

The results of these studies are coherent with several social support theories. The stress and coping social support theory states that social support buffers against stress by influencing how individuals perceive, appraise, and cope with stressful life events (Cohen & Wills, 1985). Moving beyond buffering effects against stress, the relational regulation theory also explains the main effect between social support and mental health outcomes. More specifically, the theory states that this effect occurs when people regulate their emotions, cognitions, and behavior through activities and conversations with other people (Lakey & Orehek, 2011). In sum, the findings show that different aspects of positive and supportive peer relations, despite conceptual variation between studies, are important in facilitating positive youth adjustment. In the current study, we conceptualized peer support as a term encompassing perceiving peers to be supportive, kind, and trustworthy (Salmivalli, Ojanen,
The Link between Sports Involvement and Peers Relations

Although positive outcomes of sports involvement are clear, previous research efforts do not answer sufficiently why organized sports is good for youth (Eccles et al., 2003). It has been argued that organized sports contexts provide opportunities for peer interactions (Smith, 2003) and foster peer relations (Evans & Roberts, 1987). In adolescence, the importance of peers increases (Allender, Cowburn, & Foster, 2006), and therefore, the relatedness to peers is essential to this developmental period. Engagement in sports may provide youth a context where they can develop relationships with peers and fulfill the need for relatedness (Smith, 2003).

Self-determination theory states that individuals have fundamental psychological needs for autonomy, competence, and relatedness (Ryan & Deci, 2017). Those three psychological needs also foster motivation for engagement in activities. The need and search for relatedness may motivate adolescents to get and stay involved in sports. In fact, adolescents seem to be aware of the potential benefits of the sport context for friendship. For example, adolescents get involved in organized sports because they want to make new friends and find new social contexts (Allender et al., 2006; Weiss & Amorose, 2008). Altogether, self-determination theory provides one explanation as to why adolescents engage in sports and why peers are so important in the sports context. A related explanation is provided in social support theory. As mentioned earlier, relational regulation theory emphasizes how perceived social support not only protects against stressful life events, but also directly through a main effect that supports adjustment (Lakey & Orehek, 2011). Since the sport context provides plenty of opportunities for social exchange, it makes sense that it also affects adjustment outcomes positively.
In research, the link between organized sports participation and peer relations has been demonstrated in numerous studies. Adolescents that participated in sports were found to have more prosocial peers than those who were not involved in organized sports (Fredricks & Eccles, 2005). Furthermore, several studies showed that adolescents gained peer status and acceptance from being good at sports and exhibiting physical competence (Evans & Roberts, 1987; Vierimaa & Côté, 2016; Weiss & Duncan, 1992). As such, supportive peer relations seem to be an important part of why sports is beneficial for youth adjustment. In fact, a longitudinal study by Daniels & Leaper (2006) found that peer acceptance partially mediated the link between youth sport participation and positive global self-esteem. Another longitudinal study by Fredricks & Eccles (2005) found prosocial peers to mediate the link between time in organized sports activities and levels of depression. However, in the same study, time in organized sports activities and self-worth was not mediated by prosocial peers (Fredricks & Eccles, 2005). Self-worth and self-esteem is associated to each other. The two concepts are capturing the perception of having good qualities, doing the right things, and the satisfaction with oneself (Daniels & Leaper, 2006; Harter, 1985). As such, there is some preliminary evidence for a link between organized sports participation and adjustment, but the studies are very specific and there is conflicting evidence on one variable. First, there is a need to replicate earlier findings, and second there is a need to include both negative and positive outcomes in order to capture a wider part of youth adjustment.

**Moderating Role of Social Anxiety**

Even though sports participation may help most youth to develop supportive peer relations and positive adjustment, it may not work equally well for everyone. It is possible that high rates of social anxiety prevent some youth from developing supportive peer relations in the organized sports context. In line with this argument, research shows that socially anxious children and adolescents have general difficulties acquiring friends and also
experience lower friendship quality (Gorrese, 2016; Rubin, Coplan, & Bowker, 2009). In sports, shy youth can feel uneasy due to sensitivity to negative evaluation, and fear of being perceived as physically and socially incompetent (Miller, 2012). As such, the characteristics of social anxiety may prevent the development of supportive peer relations in sports.

In terms of adjustment, socially anxious youth may be more vulnerable and likely to experience adjustment issues than their peers. Specifically, the developmental trajectory of social anxiety leads to a higher risk of interpersonal difficulties in young adulthood (Grose & Coplan, 2015). In fact, social withdrawal is a marker for later development of anxiety, major depression, and social phobia (Rubin et al., 2009). Unfortunately, untreated social anxiety tends to be fairly stable across the lifespan and generalize across multiple life contexts (American Psychiatric Association, 2013; Schneider, Younger, Smith, & Freeman, 1998). On a more positive note, research on social anxiety and sports participation is showing preliminary evidence of worth. In a longitudinal study by Findlay & Coplan (2008), shy children involved in sports reported lower levels of social anxiety as well as higher self-esteem and well-being over time. In another longitudinal study by Dimech & Seiler (2011), children practicing team sports reported reductions in social anxiety over time.

In sum, there is still ambiguity to whether socially anxious youth involved in sports receive the same benefits of increased levels of peer support and positive adjustment as their peers. Therefore, it is important to explore social anxiety and its moderating effect between sports participation and peer relations, and also between sports participation and adjustment outcomes.

The Current Study

Existing evidence shows that participation in organized sports is linked to better adjustment outcomes for youth (Haugen et al., 2013; Gore et al., 2001; Ruseski et al., 2014; Slutzky & Simpkins, 2009). Nevertheless, the specific mechanisms that contribute to these
beneficial outcomes are not clear. In adolescence, peer relations begin to gain more importance (Allender et al., 2006). Therefore, it is important to examine the role of peers in youth adjustment. In fact, adolescents involved in sports have better peer relationships, and subsequently, better peer relations is associated with positive adjustment (Fredricks & Eccles, 2005; Gorrese & Ruggieri, 2013). To date, only two studies have examined the mediating role of peer characteristics on the association between sports involvement and adjustment (Daniels & Leaper 2006; Fredricks & Eccles 2005). However, more research is needed to further explore this link to better understand why sports participation is associated with positive youth adjustment. In addition, there is a need to examine the associations between sports participation and multiple adjustment outcomes simultaneously to expand the evidence base regarding in what ways youth benefit from sports. Thus, the primary aim of this study was to investigate whether supportive peer relationships mediate the link between organized sports participation and positive adjustment, for youth in general. We hypothesized that peer support would mediate the relationship between sports participation and positive adjustment.

As stated, preliminary evidence exists that socially anxious youth that get involved in sports may benefit in similar ways and have their social anxiety reduced over time (Findlay & Coplan, 2008). However, socially anxious youth tend to report lower friendship quality than their non-shy peers (Rubin et al., 2009). Therefore, a secondary aim of this study was to examine if social anxiety moderates the mediating role of peer support in the relation between sports participation and adjustment. Specifically, we explored if high rates of social anxiety moderated the link between sports participation and peer support, and in turn, if socially anxious youth would then be less likely to benefit from positive effects of organized sports. In addition, we explored if high rates of social anxiety directly moderated the link between sports engagement and adjustment outcomes. Due to the scarcity of previous research in the field, we investigated these moderating effects on an exploratory basis.
Figure 1 shows the conceptual model in line with these hypotheses. To address the research questions, we used cross-sectional data from the first wave of the Youth & Sports Project, which collected data from adolescents in grade 7.
Method

Participants

Data came from the first wave of the cohort-sequential “Youth & Sports Project”. Data collection took place in the Swedish city of Västerås. The city was chosen because it is close to matching national averages of socioeconomic characteristics. Participants were adolescents in grade 7 (N = 679, M̄e = 14.09, SD = .39). Fifty-four percent of the adolescents were boys and 46% were girls. Sixty-five percent of the adolescents had parents with a Nordic background (i.e., Sweden, Norway, Denmark and Finland), while 35% had one or two parents with an immigrant background. As an estimate of socioeconomic status, participants rated their perceived family income on a five-point scale. Fifty-three percent of the sample perceived their family as having equal amounts of money as their classmates (M = 3.14, SD = .84).

Procedure

Prior to data collection, parents of 810 grade 7 adolescents received a letter sent by post informing them about the Youth & Sports Project details and procedures. They were offered a decline form with a pre-paid envelope to give them opportunity to refuse participation. Approximately 5% of the parents declined participation of their youth in the study. Data collection occurred during regular class hours with the assistance of trained test leaders at location in school. Youth were first described the project details and that participation was voluntary before the start of the data collection. Surveys were then handed out to youth that a) actively consented to participate and b) had their parents’ passive consent to participate. Youth were also informed that they could decline participation at any time, even after they start answering questions. To ensure anonymity and sincerity of respondents, tables and chairs were placed as far away from each other as possible. Participants had 90 minutes to fill out the survey. Two percent of attending youth declined participation and
chose to do school work instead. Youth were not offered any monetary reward for participation, but a payment of 300 SEK was offered to the class fund regardless of the number of students who participated in the study. The Youth & Sports Project procedure and material were reviewed and fully approved by the Regional Ethical Review Board in Uppsala (Regionala etikprövningsnämnden i Uppsala).

Measures

Sports participation. Participants in organized sports activities was measured by one single item (i.e., “Are you involved in some club or organization or similar where there is an adult leader that you meet one or several times a week at a certain time?”). Participants responded either yes or no. Thos item was part of the questionnaire “Sports Activities During Free Time”, which was developed for the Youth & Sports project to measure involvement in organized sports activities.

Perceived peer support. The Generalized Perception of Peers scale by Salmivalli and colleagues (2005) was used to measure perceived peer support. Participants were asked in the questionnaire to fill in statements about their same-age peers. Examples of items are “They can really be relied on”, “They really care about what happens to me”, and “They usually have good intentions”. The items were answered with a 5-point Likert scale (i.e., 1 = not at all true and 5 = exactly true). The inter-item reliability was .89.

Depression symptoms. To measure depression symptoms, the Center for Epidemiological Studies Depression Scale for Children was used (Faulstich, Carey, Ruggiero, Enyart, & Gresham, 1986). The measure is a modified version of the adult scale, and it is intended for ages 6-17 (Faulstich et al., 1986). The positively worded items were excluded because they tend to load on a separate factor. Examples of items are “During the past week, I was bothered by things that usually don’t bother me”, “During the past week, I felt down and unhappy”, and “During the past week, it was hard to get started doing
things”. Participants rated the items on a 4-point Likert scale (i.e., 1 = Not at all, 2 = Very seldom, 3 = Now and then, and 4 = Often). The measure had an inter-item reliability of .93.

**Loneliness.** The Loneliness Scale was used to measure loneliness (Asher & Wheeler 1985). The scale originally consists of 24 items, but the four most relevant items were selected for the Youth & Sports Project. Examples of items are “I have nobody to talk to in my class”, “I feel alone at school”, and “I don’t have any friends in my class”. Items were rated on a 5-point Likert scale (i.e., 1 = That’s always true about me, 2 = That’s true about me most of the time, 3 = That’s sometimes true about me, 4 = That’s hardly ever true about me, and 5 = That’s not true at all about me). One item (“I can find a friend in my class when I need one”) was excluded because it was not consistent with the other items and lowered the inter-item reliability from .85 to .75.

**Self-esteem.** To measure self-esteem, Rosenberg’s Self-esteem Scale was used (Rosenberg 1965). The measure consists of ten items with five items worded in the opposite direction. When translated to Swedish, the wording was changed from “I” to “you”. Examples of items are “At times you think you are not good at all”, “You feel you do not have much to be proud of”, and “You feel that you are a person of worth, at least on an equal plane with others”. Responses were given on a 4-point Likert scale (i.e., 1 = Don’t agree at all, 2 = Don’t particularly agree, 3 = Agree pretty well, and 4 = Agree completely). The inter-item reliability was .87.

**Subjective well-being.** The Satisfaction with Life Scale by Diener and colleagues (1985) was used to measure subjective well-being. The measure consists of five items, e.g., “I am satisfied with my life”, “The conditions of my life are excellent”, and “In most ways my life is close to ideal”. Responses are given on a 7-point Likert scale (i.e., 1 = Disagree completely, 2 = Strongly disagree, 3 = Slightly disagree, 4 = Neither agree, nor disagree, 5 =
Slightly agree, 6 = Strongly agree, and 7 = Agree completely). The inter-item reliability was .80.

**Social anxiety.** The Social Phobia Screening Questionnaire for Children was used to measure social phobia (Furmark et al. 1999). This is an adjusted version for children and adolescents, based on the Social Phobia Screening Questionnaire for adults. The instrument comprises two different parts. The first part contains situations where social phobia can be elicited, and the second part includes diagnostic items for social phobia. In the Youth & Sports Project, only the first section was included. Examples of items are “Making a phone call to someone I do not know very well”, “Going to a party”, and “Speaking in front of class”. The situations were rated on a 3-point Likert scale (i.e., 1 = No fear, 2 = Some fear, and 3 = A lot of fear). The inter-item reliability was .80.

**Missing Data**

**Planned missing data.** In large-scale surveys with many questionnaires, it is important to lower respondent burden and prevent survey fatigue, while still collecting as much data as possible (Enders, 2010). For this reason, a number of scales in the Youth & Sports Project were not administered to all participants on purpose. More specifically, a three-form design was used to plan missing data. In this design, participants are randomly split into three groups (Enders, 2010). All three groups then receive a core set of questionnaires to fill out, and then each group receive two-thirds of the remaining questionnaires. This way, each group has planned missingness of one third of questionnaires that are not in the core set. Planned missingness procedure result in missing data at random. Thus, the missing observations can be estimated using modern missing data imputations techniques, which require missingness at random. In the current study, all study variables were given in the core set to all participants, except for the Generalized Perception of Peers scale. This scale was administered to two-thirds of the sample, roughly 450 out of 679 adolescents.
Internal missing data. In addition to planned missingness, some participants did not complete all questionnaires. In total, 75.1% of the participants completed all the study questionnaires, and 96.2% of the participants had up to three missing study questionnaires.

Estimation of missing data. Planned and internal missing data was coded as missing in SPSS. Next, Missing Value Analysis was conducted using the expectation maximization (EM) algorithm. EM is an iterative optimization algorithm, that aims to find the maximum likelihood estimate for the missing data (Dempster, Laird, & Rubin, 1977). EM is conducted in two steps, an expectation step and a maximization step (Enders, 2010). In the expectation step, the mean vector and the covariance matrix of the missing data is predicted through regression equations from the observed data. Next, the maximization step estimates a new mean vector and covariance matrix based on these predictions. These two steps are repeated until the predicted missing data remain constant. By this point, a maximum likelihood estimate has been reached and the predicted data is inserted.

When using three-form data design it is recommended to use the EM algorithm to estimate random missing data (Graham, Hofer, & MacKinnon, 1996). Additionally, the EM algorithm has been shown to be reliable in producing unbiased estimates of missing data by technical and comparative studies (Graham et al., 1996; Gold & Bentler, 2000).

Data Analysis

For descriptive purposes, means, standard deviations, and bivariate correlations between the study variables were estimated. A one-way ANOVA analysis was conducted to examine mean level differences between youth who engage or do not engage in organized sports activities. To test the main research questions, we used mediation and moderated-mediation analysis using the PROCESS module for SPSS (Hayes, 2013). In the mediation model sports participation was the independent variable, perceived peer support was the mediator variable, and depression, loneliness, self-esteem, and subjective well-being were the dependent
variables. A separate mediation model was fit for each adjustment outcome. In all analyses, the demographic variables of age, gender, immigrant status, and family economy were entered into the model as covariates. We evaluated the significance of the indirect effect based on Sobel tests results and bias-corrected 5000 bootstrapped confidence intervals.

In order to explore moderation effects of social anxiety, we fitted moderated-mediation models where social anxiety could moderate the link between sports participation and peer support, as well as on sports participation and adjustment outcomes, respectively, for each adjustment outcome (see Figure 1 for a conceptual diagram). All analyses were performed using SPSS version 23.

Results

Descriptive Analysis

Table 1 summarizes the bivariate correlations, means, and standard deviations of the study variables. Sports participation was positively correlated with peer support, self-esteem, and subjective well-being, and negatively correlated with loneliness and depression. Peer support was correlated with the outcome variables in the same directions, although with stronger association. Social anxiety was negatively correlated with sports participation and peer support. In addition, social anxiety was negatively correlated with self-esteem, subjective well-being, and positively correlated with loneliness and depression. Finally, the demographic characteristics of gender and family economy were correlated with sports participation, peer support, and the outcome variables.
<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
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<tbody>
<tr>
<td>1. Age</td>
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<tr>
<td>2. Gender</td>
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<tr>
<td>3. Family economy</td>
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<tr>
<td>4. Family support</td>
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<tr>
<td>5. Sports participation</td>
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<tr>
<td>6. Perceived peer support</td>
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<td></td>
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<tr>
<td>7. Depression</td>
<td></td>
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<tr>
<td>8. Loneliness</td>
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<tr>
<td>9. Self-esteem</td>
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<tr>
<td>10. Subjective well-being</td>
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<tr>
<td>11. Social anxiety</td>
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Correlations, Means, and SD of the Study Variables.
Differences between Youth Involved and Uninvolved in Organized Sports Activities

Table 2 summarizes the mean level differences between sports-participating youth and non-sporting youth. Overall, the results showed significant differences between the groups on all outcome variables; depressive symptoms, $F(1, 595) = 18.20, p < .001$, loneliness, $F(1, 582) = 8.50, p = .004$, self-esteem, $F(1, 599) = 16.92, p < .001$, and subjective well-being, $F(1, 587) = 16.23, p < .001$. Specifically, adolescents involved in sports had lower rates of depression and loneliness, and higher rates of self-esteem and subjective well-being compared to those not involved in sports. In addition, the groups were significantly different in perceived peer support, $F(1, 377) = 9.69, p = .002$, as well as social anxiety, $F(1, 591) = 13.13, p < .001$. Specifically, adolescents involved in sports had higher rates of perceived peer support and lower rates of social anxiety compared to those not involved in sports. All these differences between the sports-participation and non-participating youth had medium effect sizes indicated by Cohen’s $d$ effect size estimate.

Table 2.

Mean level differences between adolescents who are involved and are not involved in organized sports activities on the study variables.

<table>
<thead>
<tr>
<th>Outcome variables</th>
<th>Involvement in organized sports</th>
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<tbody>
<tr>
<td></td>
<td>Not involved</td>
<td>Involved</td>
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<td></td>
<td>$M$</td>
<td>$SD$</td>
<td>$M$</td>
<td>$SD$</td>
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<tr>
<td>Depression</td>
<td>1.94</td>
<td>.65</td>
<td>1.72</td>
<td>.55</td>
<td>18.20</td>
</tr>
<tr>
<td>Loneliness</td>
<td>1.59</td>
<td>.90</td>
<td>1.37</td>
<td>.78</td>
<td>8.50</td>
</tr>
<tr>
<td>Self-esteem</td>
<td>2.95</td>
<td>.59</td>
<td>3.15</td>
<td>.54</td>
<td>16.92</td>
</tr>
<tr>
<td>Subjective well-being</td>
<td>3.45</td>
<td>.86</td>
<td>3.73</td>
<td>.75</td>
<td>16.23</td>
</tr>
<tr>
<td>Mediator variable</td>
<td>Perceived peer support</td>
<td></td>
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<tr>
<td></td>
<td>4.05</td>
<td>.72</td>
<td>4.27</td>
<td>.55</td>
<td>9.69</td>
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<tr>
<td>Moderator variable</td>
<td>Social anxiety</td>
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<tr>
<td></td>
<td>1.64</td>
<td>.47</td>
<td>1.50</td>
<td>.43</td>
<td>13.13</td>
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</table>
Mediating Role of Peer Support in the Association Between Sports Participation and Youth Adjustment

We fitted a mediation model for each youth adjustment outcome separately (i.e., depression, loneliness, self-esteem, and subjective well-being), and included demographic characteristics of the youth (i.e., age, gender, family economy, and immigrant status) as control variables in these models. Figure 2 summarizes the unstandardized regression coefficients from these mediation models. First, sport participation significantly predicted perceived support from peers, $B = .13, p = .016$. Perceived support from peers negatively predicted depressive symptoms of youth, $B = –.48, p < .001$. The direct effect of sports participation on depressive symptoms was not significant, and the indirect effect of peer support was statistically significant, $B_{\text{indirect}} = –.06, z = –2.36, p = .018, 95\% \text{ CI}: –.12, –.01$. In addition, perceived peer support negatively predicted adolescents’ loneliness, $B = –.67, p < .001$. The direct effect of sports involvement on loneliness was not significant, while the indirect effect of peer support was statistically significant, $B_{\text{indirect}} = –.09, z = –2.36, p = .018, 95\% \text{ CI}: –.17, –.01$. In terms of positive outcomes, perceived support from peers positively predicted adolescents’ self-esteem, $B = .35, p < .001$. The direct effect of sports participation on self-esteem was not significant, and the indirect effect of peer support was statistically significant, $B_{\text{indirect}} = .04, z = 2.32, p = .021, 95\% \text{ CI}: .01, .09$. Perceived peer support also positively predicted adolescents’ subjective well-being, $B = .50, p < .001$. The direct effect of sports participation on subjective well-being was not significant, while the indirect effect of perceived support from peers was statistically significant, $B_{\text{indirect}} = .06, z = 2.31, p = .021, 95\% \text{ CI}: .01, .13$.

In sum, the findings showed that peer support fully mediated the effect of sports participation on youths’ depressive symptoms, loneliness, self-esteem, and subjective well-being. In other words, youth who participated in organized sports activities perceived higher
levels of support from peers, and in turn, they displayed lower rates of depressive symptoms and loneliness, and higher self-esteem and subjective well-being. These effects were independent of the age and gender of the adolescent, immigrant status of the parents as well as family economy.

**Moderating Effect of Social Anxiety**

We fitted moderated-mediation models where social anxiety was as a moderator variable on two different associations in our model (see Figure 1). First, we tested the moderation effect of social anxiety on the association between sports participation and peer support. Second, we tested the moderation effect of social anxiety on the association between sports participation and adjustment. Age, gender, immigrant status, and family economy were
included as covariates in all moderation analyses. No significant moderation effects of social anxiety were found on either of these links.

**Discussion**

Although organized sports participation leads to better adjustment for youth, less is known about specific mechanisms that contribute to these positive outcomes. The limited number of previous research on the topic suggest that supportive peers may act as a mediator between sports involvement and adjustment outcomes. Daniels and Leaper (2006) found peer acceptance to mediate the link between sports involvement and self-esteem, and Fredricks and Eccles (2005) found prosocial peers to mediate the link between extracurricular involvement and lower rates of depression, but not the link between sports involvement and self-worth. Our study aimed to expand upon previous studies by including a greater range of both positive and negative aspects of adjustment. In addition to understanding the mechanisms through which sports participation contribute to adolescents’ adjustment, we also aimed to understand whether these processes work equally well for adolescents who are at risk for psychosocial difficulties. Specifically, we aimed to explore if adolescents with high rates of social anxiety would benefit from organized sports in the same way as their peers.

**Organized Sports Participation, Adjustment, and Peers**

The results of the current study showed that adolescents involved in organized sports activities had better adjustment outcomes. Specifically, they reported lower rates of depression and loneliness, and higher levels of self-esteem and subjective well-being. These positive findings are consistent with previous research that investigate the effects of organized sports participation on depression (Gore et al., 2001), loneliness (Haugen et al., 2013), self-esteem (Slutzky & Simpkins, 2009), and subjective well-being (Ruseski et al., 2014). In sum, the current findings provided further evidence suggesting that adolescents involved in sports
are less likely to experience adjustment difficulties than the adolescents who are not involved in sports.

In addition to experiencing better adjustment outcomes, sports-involved adolescents also perceived more supportive peer relations than adolescents who were uninvolved in sports. Similar findings regarding the link between sports involvement and positive peer relationships has been reported by several studies (Evans & Roberts, 1987; Fredricks & Eccles, 2005; Vierimaa & Côté, 2016; Weiss & Duncan, 1992). These results can be explained through several mechanisms. First, organized sports participation on a basic level provides opportunities for interactions with new peers (Smith, 2003). Adolescents who are involved in extracurricular sports may simply have higher numbers of peers than non-involved adolescents. The higher quantity of friends may contribute to increased peer support. Second, the sports context is often characterized by structure, goal-orientation, and cooperation under adult supervision (Persson et al., 2007; Özdemir & Stattin, 2012). These characteristics create an environment where communication skills and conflict negotiating skills can develop (Fraser-Thomas, Côté, & Deakin, 2005). The development of these social skills may in turn lead to higher quality friendships, and in turn, increased peer support. Third, in the sports context the adolescents may have an opportunity to interact with peers from other schools, neighborhoods, and peer groups. Meeting new and demographically diverse peers may challenge social knowledge, and therefore may increase the development of social skills. In turn, sports participation may help adolescents develop stronger peer relations compared to those who do not have such unique opportunities. In conclusion, sports-involved adolescents experience more supportive peer relations than non-involved adolescents. These results can be attributed to the skill-building characteristics of the sport context and the opportunities for new interactions for its’ participants.
Mediating Role of Peer Support in the Association between Sports Involvement and Adjustment Outcomes

Probably the most important finding of the current study is that peer support explained why participation in organized sports were related to youth adjustment. Specifically, adolescents who were involved in organized sports activities experienced lower rates of depression and loneliness, and higher rates of self-esteem and subjective well-being, because they had supportive peer relations. The potential mechanisms that may explain why peer support could be related to different indices of youth adjustment may vary across the outcomes of interest. Thus, the mediating role of peer support for each adjustment outcome is discussed separately.

**Depression.** First, having supportive and trustworthy peer relationships has been shown to buffer against depressive symptoms, primarily through influencing coping and providing emotional support (Gorrese, 2016). This lines up well with social support theory stating that social support acts as a buffer against stress (Cohen & Wills, 1985). Beyond the buffering effect, the relational regulation theory provides an explanation to the main effect between sports involvement, peer support, and depression. According to Lakey and Orehek (2011), perceived social support through interaction in shared activities regulates affect and negative thoughts. Furthermore, the theory states that diversity of relations lead to more effective regulation. The sports context may contribute to the relational diversity to adolescents’ social lives, on top of their existing family and school relationships. These social exchanges may shape the emotions, cognitions, and behaviors of the adolescent and thereby reduce depressive symptoms. Second, when adolescents are involved in sports they are more likely to have physically active peers (Anderssen & Wold, 1992). Supportive friends may therefore prevent tendencies of withdrawal and inactivity by motivating youth to maintain their active lifestyle. In fact, it has been well established that physical activities facilitate
release of endorphins, increase cell production in the hypothalamus, increase the size of the prefrontal cortex, and lead to healthier appetite and sleep, all of which are related to lower depressive symptoms (Hansen, 2016). As such, having supportive and physically active peers may serve as double protection against depressive symptoms.

**Loneliness.** At a general level, it is no surprise to find higher perceived peer support to be linked to lower levels of loneliness. Loneliness can be defined based on either or both an actual social deficit and subjective feeling regardless of social contact (Perlman & Peplau, 1981). The organized sports context provides continuous social contact with a familiar group over time. In turn, the continuous peer interactions contribute to reduced levels of actual social deficits. Organized activities also serve as contexts where social interactions and cooperation are encouraged and incentivized to a larger degree than unstructured social contexts (Persson et al., 2007). The nature of the sports context may therefore promote cooperation and prosocial behaviors. Altogether, this continuous contact, as well as the quality of the contact, may contribute to greater connection with teammates.

**Self-esteem.** In adolescence, peers become important attachment figures (Gorrese & Ruggieri, 2013). As such, supportive peers can provide positive feedback and appraisal that influences the adolescent’s self-esteem. Understanding and trustworthy peers could play an important role in promoting positive self-views and thereby increase self-worth. Furthermore, being accepted by peers is also essential in shaping global self-esteem (Gorrese & Ruggieri, 2013). In sum, supportive peer relationships may increase the adolescent’s self-esteem. Regarding organized sports context, peers that exhibit physical competence get appraisal and positive feedback from their peers (Evans & Roberts, 1987; Vierimaa & Côté, 2016; Weiss & Duncan, 1992). This positive feedback may in turn lead to increases in the physical self-concept and subsequently self-esteem.
Subjective well-being. As with loneliness, it was expected to find that positive and supportive peer relations leads to higher subjective well-being. From a developmental perspective, the influence and importance of peers increases in adolescence (Allender et al., 2006). Supportive relations with peers are crucial in this developmental stage for adolescents’ sense of relatedness, since social exclusion from the group can be perceived as dangerous (Kerr & Levine, 2008). Relatedness is an important aspect of overall well-being according to self-determination theory (Ryan & Deci, 2017). As such, having supportive peers contributes to life satisfaction, and being satisfied in overall about one’s life is an important aspect of subjective well-being (Diener et al., 1985).

Social Anxiety and Sports Involvement

Social anxiety did not moderate the effect of sports participation on peer support and adjustment outcomes. In other words, our findings showed that socially anxious youth benefited from organized sports participation in the same way that the adolescents with low social anxiety do. Although the moderating effect of social anxiety was investigated on an exploratory basis, these results are exciting and have several possible explanations.

In national guidelines for extracurricular sport associations, Swedish coaches of adolescents’ sports activities are encouraged to focus on cooperation and inclusiveness instead of achievement and winning (Riksidrottsförbundet, 2014). The current data comes from grade 7 youth in a compulsory education system. Thus, the coaches of these youth were most likely to follow these national guidelines rather than fostering elite performance. Because socially anxious youth are sensitive to negative evaluation, the emphasis on cooperation and inclusiveness might have helped them feel positive about participating and perceiving the sports context as unthreatening. In turn, these socially anxious children may have found opportunities to develop and practice their social skills and connect with their peers. Another important aspect of the Swedish sports context is that
Swedish coach guidelines stipulate the importance of letting “bench-warmer” participate more often and thereby lifting all adolescents up to a moderate level of sport-specific skills (Riksidrottsförbundet, 2014). These skills, in turn, may reduce the risk for socially anxious adolescents to perceive and experience negative evaluation from peers. In turn, this safety net may help them to benefit from the sports context as equally as non-anxious adolescents.

Another explanation related to the nonsignificant moderating effect of social anxiety could be related to the cultural attitudes towards shyness and social anxiety. In Swedish culture, moderation and reserved behavior is encouraged (Kerr, 1996). In fact, a comparative study found that Swedish people tend to associate shyness with more neutral and positive qualities, whereas there has been a tendency to associate shyness with predominantly negative qualities in the U.S. (Kerr, 1996). In sum, social anxiety is not stigmatized in the Swedish sports culture, thereby making it easier for socially anxious youth to participate than in the U.S.

Overall, the null findings regarding the role of social anxiety can be largely attributed to the inclusiveness of Swedish coaching style and the Swedish cultural view on shy behavior. However, it should also be noted that socially anxious youth may participate to a lesser extent in organized sports than their non-shy peers due to the risk of negative evaluation, or at least that they may primarily choose individual sports (Miller, 2012). Thus, the characteristics of the socially anxious adolescents involved in organized sports could be different from non-sporting socially anxious adolescents already when they enter the sports context. It could be that they are equipped with stronger social skills than their non-sporting counterparts. Future studies are needed to examine in what ways socially anxious children and adolescents in diverse sports context are different from each other and their non-sporting peers.
Limitations and Strengths

The main limitation of the current study concerns the inferences that can be drawn from cross-sectional data. In cross-sectional data, associations between study variables may in fact be reciprocal or bidirectional (Kazdin, 2014). Therefore, alternate explanations to the results need to be considered. For example, adolescents with existing peer relations may be more likely to get involved in organized sports through their peers. In terms of adjustment, it is possible that pre-existing rates of depression, loneliness, self-esteem, or subjective well-being contribute to adolescents perceiving higher or lower levels of peer support. Previous longitudinal studies which established that participation in sports promote prosocial peer relations (Fredricks & Eccles, 2005) as well as positive adjustment outcomes (Gore et al., 2001; Slutzky & Simpkins, 2009), provide greater confidence in the current results. However, future studies should use longitudinal data to test the mediating role of supportive peer relations in explaining the association between sports participation and youth adjustment outcomes.

A second inferential limitation concerns the presence of unmeasured mediators that could explain the positive effects of sports participation on youth adjustment. There are physiological benefits to generally all types of physical activity, regardless of whether they are supervised and structured or not. Since physical activity can contribute to endorphin release and subsequent reduction of depressive symptoms (Hansen, 2016), it is possible that this missing variable confounds our results in some way. It is possible that some of the lower rates of depression seen in sports-involved youth is due to the physical activity itself. In sum, future studies need to compare alternative mediating processes to reach robust conclusions or control for their effect to examine the unique contribution of the proposed mediating processes.
A third limitation concerns how sports participation was examined. In the current study, we did not make any distinction between the type of sports as long as the sports activity was characterized by the presence of an adult leader and a regular practice schedule. Given that some sports are individually oriented and some are more team-oriented, participation in these diverse contexts may lead to different outcomes for youth. It is likely that team-oriented sports provide more opportunities for psychosocial development through cooperation and communication, while individual sports may more heavily emphasize development of sport-specific skills and competition. Future studies should examine the benefits and mediating mechanisms that explain these benefits for different types of sports contexts.

Despite its limitations, several strengths of the current study should be acknowledged. The primary strength of the current study is that it brings an explanation to the effects of organized sports participation on youth adjustment. A large evidence base has already stated the psychosocial benefits of participation in organized sports activities. However, few studies have examined what specific mechanisms in the organized sports context that contribute to youth adjustment. Consequently, the results of the current study contribute to the evidence base regarding peer support and its connection to the sports context. In addition, the current study provides evidence regarding whether socially anxious adolescents benefit from organized sports as equally as their socially non-anxious peers. In sum, our findings suggest that participation in organized sports context may even help adolescents with interpersonal difficulties, and thus, be promoted across diverse groups of youth.

Finally, the present study is focused on both positive and negative adjustment outcomes for youth. The decision to include negative and positive outcome variables is in line with World Health Organization’s (2014) definition of health (i.e., “Health is a state of complete physical, mental, and social well-being and not merely the absence of disease or
infirmity”). Depression and loneliness capture the absence of infirmity, and self-esteem and subjective well-being capture the presence of mental and social well-being. As such, exclusive focus on negative outcomes fall short in providing a complete understanding of health and well-being. Our choice to include negative and positive adjustment outcomes therefore generates a broader understanding of the effects of organized sports participation.

Conclusion

Our study attempted to explain why sports involvement is beneficial for adolescents. It moved beyond previous research by including both positive and negative adjustment outcomes, and the results suggests that having supportive peers is one of the active mechanisms in the pathway between sports involvement and positive youth adjustment. Additionally, this mediational model held equally well for socially anxious youth. These results have implications that should inform practice in the organized sport context. Implementing coaching guidelines with an emphasis on inclusiveness and cooperation may be especially useful for socially anxious youth. Coaches should aim to create an environment in the organized sports context that promotes supportive peer relationships for everyone. This can be done through promoting the development of social skills (e.g., cooperation exercises) and monitoring the social interactions to prevent victimization and bullying. Although the current study answers some questions, it also raises a few more. Future research should focus on exploring what aspects of peer relations are most important, and whether these are equally beneficial for socially anxious or in other ways diverse youth. Answering these questions may bring even more light to which conditions of organized sports that are beneficial for youth adjustment.
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