Chapter 2

Sports participation and psychosocial health in elementary school children

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ABSTRACT

Objectives: We examined the associations between sports participation and three aspects of psychosocial health in children, ie internalizing problems, externalizing problems, and prosocial behavior.

Methods: Cross-sectional data from 2,062 Dutch fourth and fifth graders were obtained by means of sports participation questions and the Strengths and Difficulties Questionnaire (SDQ).

Results: Fewer internalizing problems, fewer externalizing problems, and better prosocial behavior were found for sports club members. Fewer internalizing problems were also found as frequency of sports participation increased. All associations were more prominent for boys.

Conclusions: Given the positive associations between psychosocial health and sports participation, school administrators and policymakers should develop programs that encourage children to participate in organized sports activities.

Keywords: Elementary school children; sports participation; internalizing problems, externalizing problems, prosocial behavior
The beneficial effects of participation in sports activities on physical health are well documented for children (Janssen & LeBlanc, 2010; Kriemler et al., 2011). Sports participation is often recommended in order to reduce the incidence of overweight and obesity, to combat type II diabetes, cancer, and hypertension, and for the prevention of cardiovascular disorders (Strong et al., 2005; Tremblay et al., 2011; World Health Organisation, 2010). Recently, researchers have suggested that sports participation also plays a role in the improvement of a child’s psychosocial health (Biddle & Asare, 2011; Brown, Pearson, Braithwaite, Brown, & Biddle, 2013; Eime, Young, Harvey, Charity, & Payne, 2013; Penedo & Dahn, 2005).

Psychosocial health in a child is characterized by the combination of internalizing problems, externalizing problems, and prosocial behavior (Goodman, Lamping, & Ploubidis, 2010). Internalizing problems refer to behaviors such as social withdrawal, sadness, and peer problems, and are reflected in emotional disorders (ie, depression and anxiety disorders) (Van Dorsselaer, Zeijl, Van den Eeckhout, Ter Bogt, & Vollebergh, 2007). Externalizing problems pertain to behaviors such as delinquency and aggression and are manifested in behavioral problems, including oppositional defiant disorder, conduct disorder, and attention-deficit/hyperactivity disorders (AD/HD) (Van Dorsselaer et al., 2007). Prosocial behavior refers to voluntary actions intended to benefit others (Eisenberg & Fabes, 1990).

Most studies on the relationships between sports participation and psychosocial health have focused primarily on internalizing problems; associations with externalizing problems and prosocial behavior were not often taken into account. Also, these studies have concentrated mainly on adolescents and adults and reported positive effects of sports participation on psychosocial health (Ahn & Fedewa, 2011; Larun, Nordheim, Ekeland, Hagen, & Heian, 2006; Mammen & Faulkner, 2013; Pereira, Geoffroy, & Power, 2014; Sagatun, Søgaard, Bjertness, Selmer, & Heyerdahl, 2007; Ten Have, De Graaf, & Monshouwer, 2011), sports participation may also have positive psychosocial outcomes for children ages 10 to 12 (Biddle & Asare, 2011; Brown et al., 2013; Eime et al., 2013; Larun et al., 2006). The scientific evidence for this is, however, not extensive (Lubans et al., 2016).

The objective of the present study was to investigate the relationships between participation in organized sports activities and psychosocial health in terms of internalizing problems, externalizing problems and prosocial behavior in children aged 10 to 12. Three aspects of children’s sports participation were taken into consideration: sports club membership, weekly frequency of participation in organized sports activities, and compliance with the physical activity standard of the World Health Organization (WHO).
METHODS

Participants
Data collection took place between November 2011 and June 2014 and covered 73 Dutch elementary schools (response rate 63%). The schools were well spread across the Netherlands to represent geographical differences. In total, 2,308 elementary school children participated in this cross-sectional study (response rate 72%).

Procedure
The elementary schools were contacted by telephone and e-mail. Participation was voluntary. The parents of the children received written information about the purpose, nature, and procedures of the study. There were no exclusion criteria other than the written informed consent from parents or guardians.

Paper-and-pencil questionnaires were administered during regular school hours. The children completed the questionnaires in their classroom. Furthermore, anthropometric data were obtained during school time.

Instrumentation
Psychosocial health
Psychosocial health was assessed with the self-administered version of the Strengths and Difficulties Questionnaire (SDQ). The SDQ is a validated screening instrument with respect to the psychosocial health of children and adolescents (Goodman, 2001; Muris, Meesters, & Van den Berg, 2003).

The SDQ consists of 25 items which are typically organized into five subscales: emotional symptoms subscale, peer problems subscale, conduct problems subscale, hyperactivity/inattention subscale, and prosocial behavior subscale (Goodman, 1997). For healthy subjects, organization of these items into three broader subscales is instead advised: internalizing problems, externalizing problems, and prosocial behavior (Goodman et al., 2010). The internalizing subscale is assembled from the emotional symptoms and peer problems subscales, and the externalizing subscale is assembled from the conduct problems and hyperactivity/inattention subscales (Youth in Mind, 2012). Each item in the questionnaire is formulated as a statement with a three-point response format, ranging from “not true”, to “somewhat true” to “certainly true”.

The internalizing problems subscale comprises 10 items, such as “I worry a lot” and “I get on better with adults than with people of my own age”. A lower score reflects fewer internalizing problems (Goodman et al., 2010; Muris, Meesters, Eijkelenboom, & Vincken, 2004; Van Widenfelt, Goedhart, Treffers, & Goodman, 2003). The externalizing problems subscale also comprises 10 items, such as “I get very angry and often lose my temper” and “I am easily distracted, I find it difficult to concentrate”.

A lower score on this subscale indicates fewer externalizing problems. Both of the internalizing and externalizing subscales have a possible score ranging from 0 to 20 points (Goodman et al., 2010; Muris et al., 2004; Van Widenfelt et al., 2003). The prosocial behavior subscale includes five items, such as “I try to be nice to other people. I care about their feelings” and “I often volunteer to help others (parents, teachers, children)”. A higher score on this subscale indicates better prosocial behavior. The range on this subscale is from 0 to 10 points (Muris et al., 2004; Van Widenfelt et al., 2003).

Missing data were addressed in accordance with the guidelines offered by the official manual of the SDQ (Youth in Mind, 2012). First, for each of the original subscales emotional symptoms, peer problems, conduct problems, hyperactivity/inattention, and prosocial behavior, a subscale score was calculated if at most two items were missing. The average of the remaining items was taken, and this average was multiplied by five in order to obtain the subscale score. If more than two items were missing, the subscale score was considered missing. Second, for the broader subscale internalizing problems, the subscale score was assembled from the emotion symptoms and peer problems subscale scores. Third, for the broader subscale externalizing problems, the subscale score was assembled from the conduct problems and hyperactivity/inattention subscale scores (Youth in Mind, 2012).

Internal consistency as measured by the Cronbach’s alphas of the internalizing problems subscale, externalizing problems subscale, and prosocial behavior subscale was 0.66, 0.76, and 0.66 respectively (Goodman et al., 2010). The test-retest reliability of the Dutch self-report version of the SDQ subscales was 0.76 or higher, except the prosocial behavior subscale with an ICC of 0.59 (Muris et al., 2003). For Australian and Chinese children a reliability of 0.63 to 0.86 on the prosocial behavioral subscale was reported (Liu et al., 2013; Mellor, 2004).

All three psychosocial health aspects were used as continuous outcome variables, but were also dichotomised using the clinical cut-off values distinguishing normal from borderline or abnormal health (Youth in Mind, 2012). For the dichotomized internalizing problems and externalizing problems subscales, scores in the range from 0 to 8 points were labeled as normal psychosocial health and from 9 to 20 points as borderline or abnormal psychosocial health. For the dichotomized prosocial behavior subscale, the cut-off score of 6 was used with scores below indicating borderline or insufficient strengths in this area.

Sports participation
A child’s sports participation was assessed by a frequently used questionnaire in the Netherlands, the self-report Move and Sports Monitor Questionnaire - Youth Aged 8-12 Years (MSMQ) (Ooijendijk, Wendel-Vos, & De Vries, 2007). We used two questions from this questionnaire: the question about membership in a sports club and
the question about frequency of training activities and matches per week. Furthermore, we added a question concerning the sport(s) in which the child participated.

For the validation of the questions about sports participation, we first performed a pilot study with focus groups of children aged 10-12, which resulted in some modifications. Then we conducted a meeting with experts in sports participation of children, and individual expert consultations. Based on their feedback, it was concluded that the validity of the questions was sufficient. Third, our research findings about sports participation were consistent with the results based on a large representative sample of children of the same age in the Netherlands (Tiessen-Raaphorst & Van den Dool, 2015).

Three variables indicating aspects of a child’s sports participation were constructed. The first variable concerned being a sports club member or not. The second variable pertained to the weekly frequency of the child’s participation in sports activities at these sports club. This frequency was calculated by adding together the weekly frequency of the child’s participation in training activities and the frequency of his or her participation in matches. Because of the expected non-linear relationships, the scores were divided into tertiles (Twisk, 2010). The third variable referred to the WHO standard for physical activity, implying that a child performs vigorous-intensity activities at least three times a week (World Health Organisation, 2010). In this study, the WHO physical activity standard is considered to be met when a child participates in organized sports activities two or more times per week.

**Covariates**

Several covariates were included in the analyses: age, sex, body mass index (BMI), household composition, and neighborhood socioeconomic status (SES). Parents or guardians reported the child’s date of birth and his or her sex. Height and weight were assessed using validated weighing scales during school visits by the researchers. Height was measured by the Seca 201 or 203 system (Basel, Switzerland). Weight was measured using the Seca Senza 804 (Basel, Switzerland) or the digital scale Tanita BC 601 (Tokyo, Japan). BMI was calculated as body weight in kilograms divided by the square of height in meters (kg/m²) (Cole, Bellizzi, Flegal, & Dietz, 2000).

Children were divided into two groups based on the composition of their household (Carr & Springer, 2010; Lee & McLanahan, 2015): children who lived in a family in which both biological parents were present and children who lived in another type of household, ie a one-parent household or a family with foster parents. SES of the child’s parents or guardians was determined using status scores per postal code in the year 2010 (Knol, Boelhouwer, & Ross, 2010; Reiss, 2013).
Data analyses
Frequencies (percentages) were calculated for categorical variables, means (standard deviation (SD)) for continuous variables, and medians (range) for skewed distributions. Independent t-tests and chi-square tests were performed to analyze differences between children with complete data sets and children with missing data. Descriptive statistics and differences between groups were analyzed using IBM SPSS statistical software (version 23, IBM, New York, United States). The associations between aspects of participation in organized sports and each of the three outcome variables (ie, internalizing problems, externalizing problems, and prosocial behavior) were analyzed by both linear regression (for the continuous outcomes) and logistic regression (for the dichotomous outcomes). In both cases, the regression analyses took place in three steps. First, univariate analyses were performed. Second, the analyses were adjusted for sex, age, BMI, neighborhood SES, and household composition. Finally, interaction terms for all covariates were included separately to identify possible effect modifications. Because of skewness to the right, the continuous outcome of internalizing problems was log transformed before analyses. The statistical package STATA (version 13.1; Stata Corporations, College Station, Texas) was used for the multilevel analyses. For all analyses, p < .05 was adopted for statistical significance.

RESULTS
Of the 2,308 children who filled in the questionnaires, 2,062 fully completed the questionnaires and were included in the study, while 246 children were excluded due to missing data. The excluded subjects had lower neighborhood SES (t= -2.03, p=.04) than the included children, and were more likely to live in a household that was not considered to be a two-parent family (c=7.03, p=.01). No significant differences were observed for sex, age, BMI, sports club membership, weekly frequency of participation in organized sports activities, and the outcome variables. Table 1 shows descriptive information of the sample.

Overall, 48% of the youth included in the sample were boys. Approximately 85% were a member of a sports club. The median of weekly frequency of participation in organized sports activities was three times per week. About half of the children (55%) complied with the WHO physical activity standard. The percentage of children with borderline or abnormal scores on the internalizing problems scale constituted 6.1% of the sample; on the externalizing problems scale 16.6%, of the sample; and on the prosocial behavior scale 7.1% of the sample.
As can be seen from Table 2, both linear regression analyses and binary logistic regression analyses showed that being a member of a sports club was significantly associated with fewer internalizing problems (B=-0.13, p=.002, CI=-0.21; -0.04; OR=0.67, p=.002, CI=0.42-1.07). Moderate (B=-0.19, p=<.001, CI=-0.28; -0.10; OR=0.57, p=.06, CI=0.32-1.01) and high-frequency participation in sports activities (B=-0.17, p=<.001, CI=-0.26; -0.08; OR=0.52, p=.03, CI=0.29-0.93) was also associated with fewer internalizing problems compared to non-membership. For low-frequency participation, no difference concerning internalizing problems was found when compared with non-membership (B=-.03, p=.49, CI=-0.12-0.06; OR=0.90, p=.70, CI=0.54-1.52). Complying with the WHO physical activity standard was also significantly related to fewer internalizing problems (B=-0.19, p=<.001, CI=-0.25; -0.13; OR=0.61, p=.01, CI=0.42-0.91). Adjustment for potential confounders (sex, BMI, age, SES and household composition) slightly attenuated all associations.
Table 2. Associations between internalizing problems and several aspects of participation in organized sports

<table>
<thead>
<tr>
<th>Aspects of sport participation</th>
<th>Linear regression</th>
<th>Binary logistic regression</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Crude analyses</td>
<td>Adjusted analyses</td>
</tr>
<tr>
<td></td>
<td>B*</td>
<td>p</td>
</tr>
<tr>
<td>Sports club Membership</td>
<td>-0.16</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Low</td>
<td>-0.03</td>
<td>.41</td>
</tr>
<tr>
<td>Weekly frequency of sports activities</td>
<td>Moderate</td>
<td>-0.23</td>
</tr>
<tr>
<td>High</td>
<td>-0.21</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Compliance with WHO physical activity standard</td>
<td>-0.22</td>
<td>&lt; .001</td>
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</tbody>
</table>

*a = Unstandardized regression coefficient; b = CI – Confidence Interval; c = OR – Odds Ratio; d = Sports club membership was coded as 1; e = Compliance with the WHO physical activity standard was coded as 1; f = The reference group is non-members

Table 3. Associations between externalizing problems and several aspects of participation in organized sports

<table>
<thead>
<tr>
<th>Aspects of sport participation</th>
<th>Linear regression</th>
<th>Binary logistic regression</th>
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<td></td>
<td>Crude analyses</td>
<td>Adjusted analyses</td>
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<tr>
<td></td>
<td>B*</td>
<td>p</td>
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<tr>
<td>Sports club Membership</td>
<td>-0.30</td>
<td>.12</td>
</tr>
<tr>
<td>Low</td>
<td>-0.29</td>
<td>.19</td>
</tr>
<tr>
<td>Weekly frequency of sports activities</td>
<td>Moderate</td>
<td>-0.38</td>
</tr>
<tr>
<td>High</td>
<td>-0.24</td>
<td>.29</td>
</tr>
<tr>
<td>Compliance with WHO physical activity standard</td>
<td>-0.17</td>
<td>.24</td>
</tr>
</tbody>
</table>

*a = Unstandardized regression coefficient; b = CI – Confidence Interval; c = OR – Odds Ratio; d = Sports club membership was coded as 1; e = Compliance with the WHO physical activity standard was coded as 1; f = The reference group is non-members
In binary logistic regression analyses, effect modification by sex was observed for all associations, indicating that the observed relationships were most prominent for boys. Boys showed fewer internalizing problems in relation to sports club membership (OR=0.33, p=.003), moderate frequency of sports participation (OR=0.24, p=.002), high frequency of sports participation (OR=0.25, p=.004), and compliance with the WHO standard (OR=0.31, p<.001). These associations were not observed for girls (OR=1.05, p=.87; OR=1.08, p=.84; OR=0.80, p=.58; OR=0.92, p=.74).

Externalizing problems
As shown in Table 3, fewer externalizing problems were observed for members of a sports club in comparison with non-members (B=-0.37, p=.06, CI=-0.76-0.01; OR=0.62, p=.004, CI=0.45-0.86), which is most prominent for the moderate frequency group (B=-0.53, p=.01, CI=-0.98; -0.10; OR=0.53, p=.001, CI=0.36-0.77). Compliance with the WHO standard was also associated with fewer externalizing problems (B=-0.31, p=.05, CI=-0.61; -0.01; OR=0.70, p=.01, CI=0.53-0.91). The relationships between externalizing problems and sports participation were most clear in the adjusted analyses (Table 3). No effect modification was observed for the covariates.

Prosocial behavior
Table 4 presents the results for the associations of sports participation with prosocial behavior. More or less the same associations were found for prosocial behavior as for externalizing problems, ie that better prosocial behavior was associated with sports club membership (B=0.23, p=.02, CI=0.03-0.43; OR=0.46, p=.001, CI=0.30-0.84), with low (B=0.18, p=.11, CI=-0.04-0.41; OR=0.50, p=.01, CI=0.30-0.83), moderate (B=0.27, p=.02, CI=0.05-0.50; OR=0.42, p=.001, CI=0.25-0.71) and high frequency of sports activities (B=0.24, p=.03, CI=0.02-0.46; OR=0.47, p=.004, CI=0.28-0.79), and compliance with the WHO physical activity standard (B=0.18, p=.02, CI=0.03-0.34; OR=0.59, p=.001, CI=0.37-0.78) (Table 4). There was no effect modification for the covariates.

DISCUSSION
The aim of the present study was to explore associations between sports participation and psychosocial health in fourth and fifth-grade children. The results showed that sports club membership, frequency of participation in organized sports activities, and compliance with the WHO physical activity standard were associated with fewer internalizing problems, fewer externalizing problems, and better prosocial behavior.
Table 4. Associations between prosocial behavior and several aspects of participation in organized sports

<table>
<thead>
<tr>
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<td></td>
<td>Crude analyses</td>
<td>Adjusted analyses</td>
<td>Crude analyses</td>
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<td>Adjusted analyses</td>
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<tr>
<td></td>
<td>B&lt;sup&gt;a&lt;/sup&gt;</td>
<td>p</td>
<td>CI&lt;sup&gt;b&lt;/sup&gt;</td>
<td>B&lt;sup&gt;a&lt;/sup&gt;</td>
<td>p</td>
<td>CI&lt;sup&gt;b&lt;/sup&gt;</td>
<td>OR&lt;sup&gt;c&lt;/sup&gt;</td>
<td>p</td>
</tr>
<tr>
<td>Sports club membership&lt;sup&gt;d&lt;/sup&gt;</td>
<td>0.14</td>
<td>.14</td>
<td>-0.05 - 0.35</td>
<td>0.23</td>
<td>.02</td>
<td>0.03 - 0.43</td>
<td>0.53</td>
<td>.003</td>
</tr>
<tr>
<td>Low&lt;sup&gt;f&lt;/sup&gt;</td>
<td>0.19</td>
<td>.10</td>
<td>-0.04 - 0.41</td>
<td>0.18</td>
<td>.11</td>
<td>-0.04 - 0.41</td>
<td>0.51</td>
<td>.01</td>
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<tr>
<td>Moderate&lt;sup&gt;f&lt;/sup&gt;</td>
<td>0.11</td>
<td>.30</td>
<td>-0.11 - 0.34</td>
<td>0.27</td>
<td>.02</td>
<td>0.05 - 0.50</td>
<td>0.52</td>
<td>.01</td>
</tr>
<tr>
<td>Weekly frequency of sports activities</td>
<td>0.13</td>
<td>.23</td>
<td>-0.09 - 0.36</td>
<td>0.24</td>
<td>.03</td>
<td>0.02 - 0.46</td>
<td>0.56</td>
<td>.02</td>
</tr>
<tr>
<td>High&lt;sup&gt;f&lt;/sup&gt;</td>
<td>0.04</td>
<td>.57</td>
<td>-0.11 to 0.20</td>
<td>0.18</td>
<td>.02</td>
<td>0.03 - 0.34</td>
<td>0.66</td>
<td>.02</td>
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</table>

<sup>a</sup> = Unstandardized regression coefficient; <sup>b</sup> = CI – Confidence Interval; <sup>c</sup> = OR – Odds Ratio; <sup>d</sup> = Sports club membership was coded as 1; <sup>e</sup> = Compliance with the WHO physical activity standard was coded as 1; <sup>f</sup> = The reference group is non-members
The observed association between membership to a sports club and internalizing problems was in line with that of other studies. Findlay and Coplan (2008), Schumacher Dimech and Seiler (2011), and Vella, Cliff, Magee, and Okely (2015) also reported that children who participated in sports had fewer internalizing problems than non-participants.

Sports club membership, greater frequency of participation in sports activities, and compliance with the WHO standard were relevant factors to internalizing problems. An explanation for this might be that sports activities offer children the possibility to improve their sports skills and physical fitness (Donaldson & Ronan, 2006; Eime et al., 2013; García et al., 2014), which in turn may have a positive influence on their sports self-concept (García et al., 2014; Slutzky & Simpkins, 2009). A better sports self-concept is conducive to an increase in one’s self-esteem (Bowker, 2006; Findlay & Coplan, 2008; Lee & Stone, 2012), which in turn offers protection against internalizing problems (Bowker, Gadbois, & Cornock, 2003; Slutzky & Simpkins, 2009). Because the development of sports skills and the improvement of physical fitness require a minimum level of exercise, it is logical that fewer internalizing problems were observed as the frequency of participation in organized sports activities increased.

The observed sex effect was in line with previous studies as well. Ahn and Fedewa (2011) and Molinuevo, Bonillo, Pardo, Doval, and Torrubia (2010) also reported that boys had larger psychological benefits from sports than did girls. An explanation may be that, in general, boys derive more self-esteem from success in sports activities than do girls (Bowker, 2006; Daley, 2002). Bowker (2006) reported that satisfaction with physical competence (skills, fitness) influences a boy’s self-esteem, whereas satisfaction with physical appearance (body, weight) was of more significance for most girls. Furthermore, Chalabaev, Sarrazin, Fontayne, Boiché, and Clément-Guillotin (2013) and Plaza, Boiché, Brunel, and Ruchaud (2016) argued that boys and girls are susceptible to stereotype effects. The impact of sports participation on one’s self-esteem varies by sex because sports participation is still largely considered to be a male activity in Western society (Capranica et al., 2013; Eagleman, 2015).

With respect to externalizing problems, the research findings were partially in line with those of the small number of other studies in this field. Fewer externalizing problems were reported by members of a sports club in comparison with non-members, confirming the studies done before 2010 by Donaldson and Ronan (2006), Kantomaa, Tammelin, Ebeling, and Taanila (2008), and Simpkins, Ripke, Huston, and Eccles (2005) in which participation in sports activities was associated with fewer conduct problems in children. In the more recent studies of Denault and Déry (2015), Howie, Lukacs, Pastor, Reuben, and Mendola (2010), Sagatun et al. (2007), and Vella et al. (2015), however, no such association was reported.
An explanation for the present finding might be that organized sports activities are likely to provide learning opportunities for new social skills and create opportunities for positive experiences with peers and supervisors of the activities. Increased social skills and positive social experiences may result in fewer externalizing problems (Denault & Déry, 2015).

Externalizing problems in members of a sports club, in comparison with non-members, did not decrease as weekly frequency of participation in sports activities increased. This can be explained by the development of effortful control as an important aspect of how a person regulates emotional reactions (Rothbart & Derryberry, 1981). Effortful control refers to “the ability to willfully or voluntarily inhibit, activate, or change (modulate) attention and behavior, as well as executive functioning tasks of planning, detecting errors, and integrating information relevant to selecting behavior” (Eisenberg, Smith, & Spinrad, 2004). Children with high effortful control are likely to show fewer externalizing problems (Eisenberg et al., 2004) and a lack of effortful control may result in increased behavioral problems (Wang, Eisenberg, Valiente, & Spinrad, 2016). Effortful control is a temperament characteristic, and is therefore biologically rooted and relatively stable across time and contexts (Bates, Schermerhorn, & Petersen, 2012; Eisenberg et al., 2004). It can be influenced by experience, which occurs in children mainly between the ages of 2 and 7 years (Rothbart & Rueda, 2005; Rothbart, Sheese, Rueda, & Posner, 2011). One might argue that the children in our sample, who were mainly aged 10 to 12, had already gained a certain degree of stability in their effortful control and could therefore only be influenced by sports participation to a limited extent.

The observed positive association between sports club membership and prosocial behavior confirmed what has been reported in previous studies on this subject (Denault & Déry, 2015; Fletcher, Nickerson, & Wright, 2003; Howie et al., 2010). The disciplining effect that sports activities have on children (Denault & Déry, 2015; Donaldson & Ronan, 2006) likely also extends to prosocial behavior (Byrd & Martin, 2016; Rutten et al., 2007).

The observation that prosocial behavior did not improve with increasing frequency of sports activities can be explained when the specific character of sports activities is taken into account. Practicing sports activities is to some extent at odds with prosocial behavior. To be successful in sports, one must sometimes behave somewhat selfishly since an athlete who is too considerate of others may not easily win (Camiré & Trudel, 2010). A higher frequency of sports participation will therefore not necessarily result in better prosocial behavior.
Strengths and limitations

A strength of our study is the socially heterogeneous composition of the sample. Although the elementary schools were not randomly selected, the children came from all over the Netherlands, they lived in families with different household compositions and had a background in different social economical statuses. These conditions favored the external validity of the research findings.

Another strength of our study is that it included externalizing problems and prosocial behavior as components of psychosocial health. Most other studies on the relationship between sports participation and psychosocial health focus primarily or exclusively on internalizing problems.

A limitation of our study is, however, that it provides no insight into the possible causal relations between (aspects of) sports participation and (aspects of) psychosocial health. With respect to internalizing problems, for example, we cannot rule out the possibility that a higher frequency of participation in sports activities is not a cause but a consequence of having a better self-concept and higher self-esteem or that the relationship may be bi-directional (Da Silva et al., 2012; Vella, Swann, Allen, Schweickle, & Magee, 2017). With respect to externalizing problems, it could be that some children already had externalizing problems that prevented them from joining a sports club. Involvement in a sports club requires a child to obey the instructions of a supervisor or coach (Larson, 2000). Children with more externalizing problems were perhaps less willing to accept rules and authority and would therefore be less likely to participate in a sports club.

Another limitation of the study was that sports participation and psychosocial health were measured by means of written questionnaires. Children completed the questionnaires on their own to reduce the likelihood of them giving socially desirable answers. This does not, however, preclude the possibility that socially desirable were still given.

A further limitation concerns more specifically the validity of the questions about sports participation. As explained in the method section, we ensured the validity of these questions by means of a pilot study, an experts meeting, a number of expert consultations, and a comparison of our findings with those of another large Dutch sample. However, due to the possible recall bias of children, there may be an underestimation of the frequency of sports participation for sports that have no weekly matches.

An additional limitation relates to the moderate test-retest reliability of the prosocial behavior scale. This may be a consequence of the low stability of prosocial behavior in this age group (Lundh, Wångby-Lundh, & Bjärehed, 2008).

A final limitation relates to the psychosocially healthy condition of the children in the sample, with rather low scores on the internalizing problems and externalizing problems subscales and rather high scores on the prosocial behavior subscale. Despite this
low spread in scores on the three psychosocial health subscales, significant associations between these scores and aspects of sports participation were found.

CONCLUSIONS

Data from a sample of 2,062 fourth and fifth-grade elementary school children showed that all three aspects of a child’s psychosocial health were positively associated with being a member of a sports club and by complying with the WHO physical activity standard. More frequent participation in organized sports activities was also associated with fewer internalizing problems. The associations between psychosocial health and membership to a sports club, frequency of sports participation, and compliance with the WHO physical activity standard were most prominent for boys.

IMPLICATIONS FOR HEALTH BEHAVIOR OR POLICY

Given the positive associations between psychosocial health and sports participation, children should be encouraged to participate in organized sports activities. Elementary school administrators and local sports policymakers can contribute to this in several ways.

In addition to the usual physical education lessons, elementary school administrators could facilitate the development and implementation of programs that offer students special physical activities.

Another option to promote children’s participation in organized sports activities could be that elementary school administrators and local sports policymakers develop a common policy that allows Physical Education (PE) teachers to monitor sports activities offered by sports clubs in the neighborhood of the school and to have contacts with these clubs. As a consequence, natural cooperation between elementary schools and neighboring sports clubs will arise. Being professionals, PE teachers can support volunteers of sports clubs in developing and providing sports activities that are tailored for specific groups of children (Geidne, Quennerstedt, & Eriksson, 2013).

Finally, elementary school administrators could facilitate the development and implementation of a mix of sports activities several times per week after school hours. Extracurricular school-based sports programs may also offer less skilled children who are not a member of a sports club opportunities to improve their physical and behavioral skills. The extracurricular sports programs may function as a stepping stone for future participation in activities of regular sports clubs (De Meester, Aelterman, Cardon, De Bourdeaudhuij, & Haerens, 2014).
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Human Subjects Approval Statement
Informed consent was obtained for all children and all procedures in this study were approved by the Medical Ethics Committee of VU University Amsterdam (12/151).

Conflict of Interest Declaration
The authors have no conflict of interest to declare.
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