

University of Groningen

## Healthy adolescence in the context of leisure time

Badura, Petr

**IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.**

*Document Version*

Publisher's PDF, also known as Version of record

*Publication date:*

2018

[Link to publication in University of Groningen/UMCG research database](#)

*Citation for published version (APA):*

Badura, P. (2018). *Healthy adolescence in the context of leisure time: The role of organized and unstructured leisure-time activities*. [Thesis fully internal (DIV), University of Groningen]. University of Groningen.

### Copyright

Other than for strictly personal use, it is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license (like Creative Commons).

The publication may also be distributed here under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license. More information can be found on the University of Groningen website: <https://www.rug.nl/library/open-access/self-archiving-pure/taverne-amendment>.

### Take-down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Downloaded from the University of Groningen/UMCG research database (Pure): <http://www.rug.nl/research/portal>. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.

Healthy adolescence in the context of leisure time:  
The role of organized and unstructured leisure-time activities

Petr Baďura

Copyright

© Petr Baďura  
© 2015 BioMed Central (Chapter 4)  
© 2016 Public Library of Science (Chapter 6)  
© 2017 Springer-Verlag GmbH (Chapter 5)  
© 2017 Elsevier Ltd. (Chapter 3)  
© 2018 Springer-Verlag GmbH (Chapter 7)

Thesis for the University of Groningen, the Netherlands – with summary in Dutch and Czech.

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means electronic, mechanical, photocopying, recording or otherwise, without prior written permission of the author.

Correspondence:

Petr Baďura  
petr.badura@upol.cz; petr.badura@hbsc.org

This study was supported by the Czech Science Foundation (GACR) under Contracts. no. 14-02804S, 16-14620S and 17-12579S, by the Slovak Research and Development Support Agency (APVV) under Contracts No. APVV-0032-11 and APVV-15-0012, by the institutional grants of Palacký University under reg. no. IGA\_FTK\_2017\_009, and by the Ministry of Education, Youth and Sports of the Czech Republic under Contract No. LG14043.

The printing of this thesis was supported by the Graduate School for Health Research (SHARE), the University Medical Center Groningen (UMCG) and the University of Groningen.

Design and layout: Petr Baďura  
Cover background picture: Michal Dankulinec ([www.dankulinec.sk](http://www.dankulinec.sk))  
Language corrections: David L. McLean  
Press: PROPERUS, s.r.o.  
Printed in the Czech Republic

ISBN 978-94-034-0844-6 (printed version)  
ISBN 978-94-034-0843-9 (digital version)



university of  
 groningen

# Healthy adolescence in the context of leisure time

The role of organized and unstructured leisure-time activities

PhD thesis

to obtain the degree of PhD at the  
 University of Groningen  
 on the authority of the  
 Rector Magnificus Prof. E. Sterken  
 and in accordance with  
 the decision by the College of Deans.

This thesis will be defended in public on

Wednesday 19 September 2018 at 14.30

by

Petr **Ba**d'ura

born on 29 August 1986  
 in Olomouc, Czech Republic

Supervisors

Prof. S.A. Reijneveld  
Prof. A. Madarasova Geckova

Co-supervisors

Dr. J.P. van Dijk  
Dr. D. Sigmundova

Assessment committee

Prof. A. Dijkstra  
Prof. M. Janura  
Prof. C.P. van der Schans

# Table of Contents

Chapter 1 .....	7
Introduction	
Chapter 2 .....	17
Data sources	
Chapter 3 .....	21
Do family environment factors play a role in adolescents' involvement in organized activities?	
Chapter 4 .....	31
When children play, they feel better: Organized activity participation and health in adolescents	
Chapter 5 .....	41
Participation in organized leisure-time activities and risk behaviors in Czech adolescents	
Chapter 6 .....	53
Is participation in organized leisure-time activities associated with school performance in adolescence?	
Chapter 7 .....	63
Can organized leisure-time activities buffer the negative outcomes of unstructured activities for adolescents' health?	
Chapter 8 .....	73
General discussion	
References .....	89
Summary .....	101
Samenvatting .....	103
Souhrn .....	105
Acknowledgements .....	107
About the author .....	109
Groningen Graduate School of Medical Sciences - Research Institute SHARE and previous dissertations .....	111

## List of abbreviations

ANOVA	Analysis of variance
CI	Confidence interval
FAS	Family Affluence Scale
HBSC	Health Behaviour in School-aged Children
HSD	Honest significance difference
N/A	Not available
OECD	Organisation for Economic Co-Operation and Development
OLTA	Organized leisure-time activities
OR	Odds ratio
PYD	Positive Youth Development
RQ	Research question
SES	Socioeconomic status
SPSS	Statistical Package for Social Sciences
UA	Unstructured activities
WHO	World Health Organization
YMCA	Young Men's Christian Association

## Introduction

This thesis deals with the associations of adolescents' involvement in organized and unstructured leisure-time activities with health- and school-related outcomes in the context of their family environment. This first chapter provides the theoretical rationale for investigating the topic, presents the main aims of the thesis through the related research questions and theoretical model and outlines the structure of the further thesis.

### 1.1 Leisure time and its specifics in adolescence

Leisure, i.e. time that can be spent more or less at one's own discretion, represents an important element in life and, as such, is related to health and health-related behaviours (Weybright et al., 2015; Wong et al., 2017). Opaschowski (1976) listed eight basic functions of leisure time: *a) recreation* (recreation, health and well-being), *b) education* (getting to know, learning stimulation, further learning), *c) compensation* (equilibrium, diversion, pleasure), *d) contemplation* (resting, relaxation, self-determination), *e) communication* (communication, contact, sociability), *f) integration* (being together, community aspects and group formation), *g) participation* (taking part, commitment and social self-representation) and *h) enculturation* (creative development, productive activity and participation in cultural life). This indicates the broad area of impact that leisure time has on human lives.

Leisure time is believed to be very closely associated to general life satisfaction and well-being. Newman et al. (2014) proposed a model of five psychological mechanisms that mediate the link between leisure time and global well-being and lead to fulfilment of the above functions. These mechanisms are detachment-recovery (exploiting individual resources not used in work/school), autonomy (control of and freedom in leisure), mastery (facing challenges and learning experiences), meaning-making (gaining important life values) and affiliation (engagement with others) (Newman et al., 2014). Newman originally coined these mechanisms for adults. Importantly for the present thesis, the model appears to apply also to adolescents, as the structure of and satisfaction with leisure time have been observed to be associated with enhanced well-being already in the period of adolescence (Sarriera et al., 2014).

Over the past decades, the structure and content of leisure time has been changing dramatically (Kleiber & Powell, 2005; Lopez-Sintas et al., 2017). In general, this is mostly attributed to the rapid development of 'new media'. At first, time spent in front of TV increased significantly up to about 2000 (Voorpostel et al., 2010). More recently, TV has been substituted by newer digital technologies that are 'permanently Internet-connected' and offer novel leisure-time pursuits (Lopez-Sintas et al., 2017). Bucksch et al. (2016) confirmed this technology-related trend in an international comparison of adolescents, when they reported a decrease of TV watching since 2002, which was, however, more than offset by a prominent increase in time spent using a computer. Nonetheless, this would be a bit too reductionist point of view, because numerous opportunities have also arisen regarding 'active ways' of leisure-time spending. This is evident from the general increase in the size of employment in the leisure services industry, particularly in the fields of sports, well-being or special events (Oner & Klaesson, 2017). Similarly, the wider accessibility of active leisure pursuits is obvious from the trend of so-called 'indoorisation of originally outdoor activities' (van Bottenburg & Salome, 2010), e.g. indoor climbing or skiing. The picture of the significant shift in leisure-time use is further complemented by the rising popularity of various youth-appealing 'lifestyle sports' (Sisjord, 2015), such as freerunning or longboarding, and the boom of public-open distance running (e.g. Running USA, 2017) or various obstacle/endurance races, e.g. Spartan races.

In conjunction with the changes in leisure-time contents, the amount of adolescents' leisure time has substantially risen, too (Zick, 2010). This contradicts the findings on time use of adults from seven developed countries. The authors observed that since the 1960s the decrease in the weekly hours of leisure time of adults has been 'compensated for' by an increase in time spent on paid work and child care; however, there were some cross-country, socioeconomic and gender variations



(Gimenez-Nadal & Sevilla, 2012). Among adolescents, leisure is estimated to constitute almost a half of their time budgets, with the other main constituents being personal care (e.g. sleep and hygiene) and schoolwork (Larson, 2001; Wight et al., 2009). This, however, holds true mostly for industrialised Western nations (Larson & Verma, 1999). It is very likely that both the structure and amount of leisure time are different in less industrialised and in non-Western countries. For instance, youth from industrialised East Asian countries spend generally more time on schoolwork than in leisure, while in non-industrialised states, such as poor rural regions of India or Nepal, leisure time is often curtailed by work, as indicated at the end of 1990's (Larson & Verma, 1999). In addition, socially disadvantaged, marginalised, (Blomfield & Barber, 2011; Camacho & Fuligni, 2015) and health-impaired children and youth (Orlin et al., 2010) also differ regarding their use of leisure time. Finally, one must acknowledge that even for the general population of youth from Western industrialised countries there are individual variations; some adolescents report having notably more leisure time than others do (Hunt et al., 2015).

In contrast to the two 'obligatory' domains (i.e. personal care and schoolwork), leisure time provides adolescents with room for a wider range of activities. Moreover, since the selection of leisure-time activities in adolescence is derived mostly from intrinsic motivation (Larson, 2000), the content of leisure is subject to significantly more pronounced inter-individual differences (Nelson & Gastic, 2009). Some ways of spending leisure time, such as peer-oriented, unsupervised, unstructured activities, may serve as a context for engagement in risk behaviours, while others, such as organized activities, are often perceived as health-enhancing and supporting development (Caldwell & Faulk, 2013). Leisure time therefore should certainly not be considered only as 'empty time' or a 'waste of time', as it was, for instance, in the 1700s, when leisure represented a sinful contradiction to work and family responsibilities, based on Martin Luther's work ethic (Juniu, 2000). Previous research suggests the understanding of leisure time rather as a time full of opportunities for healthy youth development (Larson, 2000; Lerner, 2005).

## 1.2 Theory of Positive Youth Development

Regarding its theoretical perspective, the thesis is framed in the Theory of Positive Youth Development (PYD) (Lerner, 2005). The PYD theory builds upon the premise that every individual possesses certain strengths, which need to be nurtured through the provision of appropriate contextual assets (Bowers et al., 2014; Lerner, 2005; Theokas et al., 2005). The alignment of individual strengths with contextual assets is then supposed to promote PYD, i.e. result in adolescents thriving.

The PYD theory emerged in response to a change of the scientific paradigm towards adolescence. At the very beginning of research on adolescent development, the founder of this scientific field – G. Stanley Hall – labelled adolescence as a life period of inevitable 'storm and stress' (Hall, 1904). Hall believed that development of an individual reflected the evolution of the human species and that adolescence was the period corresponding with transformation from a beast-like creature to a civilized being (see Lerner, 2005). Accordingly, the main developmental task for adolescents was to overcome one's 'beast-like impulses', i.e. to avoid health-risk and norm-breaking behaviours. Since then, this paradigm has literally turned 180 degrees. As the research on adolescence evolved, adolescents stopped being perceived only as 'problems to be managed'. It further became clear that 'problem-free does not mean prepared' (Roth & Brooks-Gunn, 2003). Contemporary science focuses on the positive aspects and strengths that youth have instead (e.g. Lerner, 2005; Theokas et al., 2005).

The foundations of the PYD theory on adolescent development have been built upon two generally recognized principles of developmental psychology. The first principle regards the *mutually influential relations between individual and context* that form a basic unit of analysis within human development. A second principle is that of *plasticity*, understood as the potential for intra-individual change in a developmental trajectory occurring in relation to variation in contextual conditions (Lerner, 2005). These two principles jointly constitute the premise that adolescents' thriving is a consequence of appropriate alignment of adolescents' strengths and assets of their contexts.

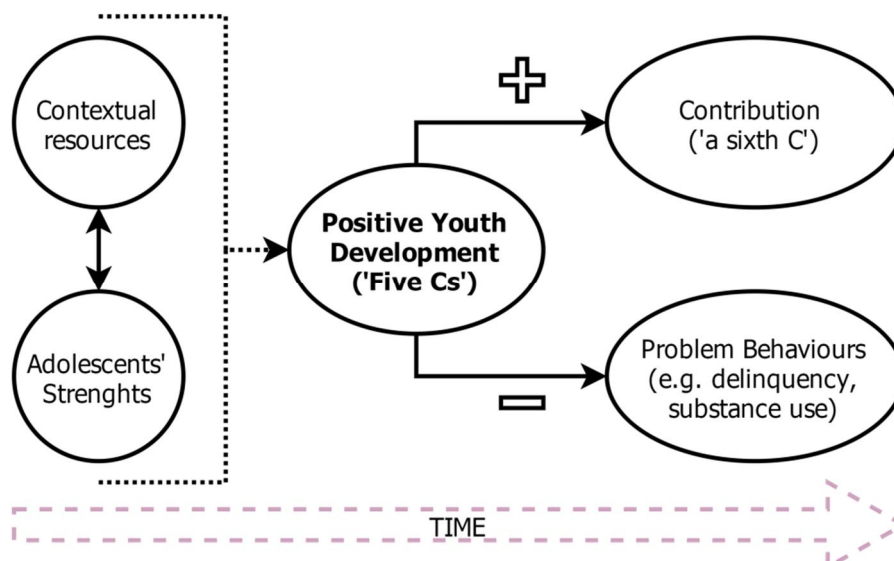
As mentioned above, the occurrence of the interaction between individual strengths and contextual assets alignment is supposed to promote PYD, i.e. result in thriving. PYD has been conceptualized through the 'Five Cs' – Competence, Confidence, Connection, Character and Caring (Bowers et al., 2010; Lerner, 2005; Phelps et al., 2009). The presence of these 'Five Cs' across time was

hypothesised to promote a ‘sixth C’ – Contribution to self, family and society (Lerner, 2005). This was later also empirically supported in longitudinal research (Jelicic et al., 2007). When an adolescent boy or girl manifests these Cs over time, he or she is theoretically thought to be on a trajectory towards an ‘ideal adulthood’, understood as integrated and mutually reinforcing contributions to the self (e.g. maintaining one’s health and thus remaining an active agent in one’s own development) and to family, community and civil society institutions (e.g. families, neighbourhoods, schools, or religious groups) (Lerner, 2005; Lerner et al., 2010).

Furthermore, in the PYD theory, thriving has been hypothesized to be inversely associated with health-risk or delinquent behaviours (Lerner, 2005; Lerner et al., 2010). This implies that the best way of risk prevention is to focus on individual strengths and promotion of PYD through contextual assets. This was, however, later documented only partially, with some adolescents showing evidence for both positive and negative indicators of youth development, i.e. the ‘six Cs’, as well as substance and delinquency at the same time (Jelicic et al., 2007; Lewin-Bizan et al., 2010).

Last, but certainly not least, the PYD theory also assumes that community-based programs represent a crucial source of developmental assets (Lerner, 2005). In other words, organized leisure-time activities are one of the contexts offering the alignment of adolescents’ strengths with appropriate contextual resources, thus allowing adolescents to get on the ‘trajectory towards an ideal adulthood’ and to thrive (Larson, 2000; Mahoney et al., 2005; Roth & Brooks-Gunn, 2003).

Figure 1.1 The model of prerequisites and outcomes of Positive Youth Development proposed by the PYD theory (adapted from Bowers et al., 2014)



### 1.3 Organized leisure-time activities as a context for adolescents' development

Organized leisure-time activities (OLTA), as denoted in the present thesis, refer to activities that adolescents do in a club or another kind of organized framework (e.g. association or organized movement) in their waking, out-of-school hours. Alternatively, these sorts of activities are sometimes called extracurricular, after-school or out-of-school-time activities. In general, these activities take place outside the regular school curriculum and are typified by adult-supervision, the presence of a structure and defined rules and goals, a regular schedule and putting emphasis on skill-building (Larson, 2000; Roth & Brooks-Gunn, 2003). They comprise various categories of activities ranging from organized sports and artistic pursuits to attending religious meetings (Hansen et al., 2010). The following sections will provide insight into developmental outcomes reportedly associated with participation in OLTA and variations in these associations by basic characteristics of OLTA, as well as differences in OLTA participation by adolescents' sociodemographic factors. Moreover, mechanisms explaining why particularly OLTA are supposed to lead to healthy development are presented.

#### 1.3.1 Organized leisure-time activities and positive developmental outcomes

Evidence is strong that various ways of spending leisure time are linked to a wide array of developmental and behavioural outcomes. OLTA in particular, as a means to promote healthy development, have been at the centre of researchers' attention, although they account for just a fairly small portion of adolescents' time, about 5-6 hrs a week on average (Fredricks, 2012; Mahoney & Vest, 2012). The available research found that adolescents involved in OLTA report higher life satisfaction (Leversen et al., 2012; Zambon et al., 2010) and show better psychological adjustment (Fredricks & Eccles, 2006b), school performance (Fredricks, 2012), a higher sense of belonging at school (Knifsend & Graham, 2012), higher educational aspirations (Chesters & Smith, 2015) and also attainment (Martin et al., 2015). Conversely, participants in OLTA are less likely to be engaged in health-risk behaviours, including substance or drug use (Darling, 2005; Takakura, 2015), and to get involved in antisocial (Mahoney & Stattin, 2000) or delinquent behaviours (Fleming et al., 2008). Some of the studies even measured these associations longitudinally and showed that participation in OLTA might serve as a predictor of, for example, success in the educational system (Fredricks & Eccles, 2006b) or prevention of school dropout, particularly among at-risk youth (Mahoney & Cairns, 1997; Neely & Vaquera, 2017).

A comprehensive systematic review by Farb and Matjasko (2012) provided an overview of youth developmental outcomes in the main fields of research on participation in OLTA, i.e. its relations with school performance, substance use, sexual activity, psychological adjustment and delinquency. The authors concluded that the relationships between OLTA participation and developmental outcomes were mixed, with some studies supporting the existence of links with indicators of healthy development and some failing to do so (Farb & Matjasko, 2012). This inconsistency seems unlikely to be explained just by the different methodological approaches of the studies included. In other words, mere participation in any organized leisure-time activity is perhaps not the sole factor behind the associations with developmental outcomes.

#### 1.3.2 Role of types of organized leisure-time activities and patterns of participation

OLTA concern a wide array of activities, including e.g. sports, art pursuits, scouts and religious clubs. As evident from the examples given, the particular activity types represent very different environments in terms of setting, purpose of activities and the assumed characteristics of adult leaders and co-participating peers. It seems only logical that outcomes associated with participation thus vary by type of OLTA.

Different types (or more broadly, categories) of activities have been shown to provide adolescents with different learning/developmental experiences (Hansen et al., 2010; Larson et al., 2006). In a study of Larson et al. (2006), for instance, sport club members reported higher rates of initiative or teamwork experiences but also more frequent stress, compared with the average. In contrast, youth in community-oriented activities (e.g. scouts) scored higher on building of adult networks and social capital, and membership in a faith-based group was associated with significant identity-formation experiences and the building of positive relationships (Larson et al., 2006). This means that the actual type of the activity certainly plays its role, as it might lead to different outcomes (Agans & Geldhof, 2012; Zarrett et al., 2009). For example, one study found religious activities to be unrelated to school grades, while other types of activities were associated with better school

performance (Himelfarb et al., 2014). There were even some indications that particular types of activities might be linked with negative outcomes, too. For instance, members of sport clubs were reported to be more prone to drink alcohol (Darling et al., 2005; Hoffmann, 2006) or act violently (Kreager, 2007) than those participating in other types of activities and even than non-participants.

Nonetheless, many adolescents participate in more than just one activity, which leads to combining various activity types and, in turn, also sources of developmental experiences. Such patterns of OLTA participation were shown to be uniquely linked to developmental outcomes (Linver et al., 2009; Metzger et al., 2009; Zarrett et al., 2009). For instance, concurrent participation in sports and youth development programs (e.g. YMCA) predicted PYD, while this relationship diminished for the combination of sports and religion after controlling for quantity of participation (Zarrett et al., 2009). As single variables or individual behaviours do not explain so much variance in the data, the focus on patterns of activity involvement seems to be reasonable when researching adolescents' OLTA participation (Ferrar et al., 2013; Metzger et al., 2009). This so-called person-centred analytical approach (Farb & Matjasko, 2012) is suitable for capturing a more comprehensive view of adolescents' leisure-time use (Bartko & Eccles, 2003; Zarrett et al., 2009) and allows patterns of leisure-time involvement, i.e. combinations of specific activities or activity types, to be studied. As a consequence, it yields information that better reflects the reality of adolescents' lives, because it enables the grouping of adolescents based on their shared participation in particular activity types (Linver et al., 2009).

### 1.3.3 Unique dimensions of participation in organized leisure-time activities

Potential developmental outcomes of OLTA also depend on fundamental dimensions of participation itself, and not only on the type of activity or pattern of participation. These dimensions have been summarized and described in detail by Bohnert et al. (2010). They regard *breadth* (number of different activity types, which is based on the premise that e.g. participation in sports and arts is more beneficial than participation in only one of these activities – (Cabane et al., 2016), *intensity* (alternatively dosage – amount of exposure, e.g. number of hours spent in activity per week), *engagement* (based on the premise that merely attending the activity is hardly to be considered developmental and an adolescent needs to get immersed in the activity, i.e. experience 'flow' (Csikszentmihalyi, 1990)) and *duration* (or consistency – the number of years a youth has participated in a given activity).

Thus far, research has focused largely on *breadth* (somewhat related to the pattern of participation mentioned above), which has often been discussed as a key factor between OLTA participation and healthy development. This was based on the hypothesis that adolescents who are involved in several distinct types of activities have access to more developmental opportunities (Bohnert et al., 2010; Farb & Matjasko, 2012; Linver et al., 2009) and that drawbacks of one sort of activity can be compensated for by participating in another sort of activity. The breadth of participation has indeed been found to be linked with academic adjustment (Fredricks & Eccles, 2010), psychological functioning and behavioural outcomes (Sharp et al., 2015) or building positive values towards society (Denault & Poulin, 2009). *Intensity* (or dosage) should also be taken into account, because it was assumed that the longer time youth spend on an activity, the more they are exposed to developmental experiences (Hansen & Larson, 2007). However, Rose-Krasnor et al. (2006) observed that only breadth had these unique relations with developmental outcomes, if intensity and breadth of participation were examined simultaneously. In contrast, Denault and Poulin (2009) documented that both breadth and intensity of participation influence later outcomes. Similarly, both the breadth and intensity of OLTA participation were associated with lower odds for school dropout (Neely & Vaquera, 2017). Logically, these two participation dimensions are to a certain extent interconnected, though not unconditionally, and an increase in breadth is likely to lead also to an increase in intensity. Nonetheless, they seemingly constitute distinct features of OLTA participation, as described by Bohnert et al. (2010).

With regard to the breadth and intensity dimensions, the existence of the 'over-scheduling hypothesis' should be acknowledged (Mahoney et al., 2006). This hypothesis expresses worries that adolescents' schedules are filled with too many organized activities at the expense of time spent in joint family activities, their well-being, putting them under excessive pressure, etc. Only a handful of studies show any effects of over-scheduling, however. Moreover, if so, such effects were observed especially in specific sub-populations. Luthar et al. (2006), for instance, observed high rates of internalizing symptoms in girls intensely involved in OLTA. However, this applied particularly to girls from affluent families who, at the same time, perceived their parents to be overly critical and

achievement-oriented. High intensity OLTA participation was also recently reported to be associated with increased risk-taking but only in adolescents with low coping efficacy; high coping efficacy was conversely associated with lower risk-taking (Heaslip & Barber, 2017). In summary, this hypothesis remains rather weakly supported by evidence (Farb & Matjasko, 2012; Mahoney & Vest, 2012). Nonetheless, it should be noted that a few studies actually documented a certain threshold effect, i.e. a plateau or slight decline of positive influence on academic (Fredricks, 2012; Knifsend & Graham, 2012) and psychosocial outcomes (Randall & Bohnert, 2012), and less social time spent with parents (Mahoney et al., 2006) when the breadth or intensity of participation was too high.

Out of the four OLTA dimensions, *engagement* has in particular received increased interest among researchers lately (Lynch et al., 2016). It has been found that a greater level of engagement leads to improvements in the moral and performance side of an adolescent's character, and, in turn, also predicts OLTA participation itself (Denault & Poulin, 2016). This supports Larson's (2000) argument that engagement in activity is crucial for OLTA participation to have effect on youth development. *Duration* of participation has, in general, received less attention (Bohnert et al., 2010). Nonetheless, it has been shown that the longer the OLTA participation lasts, the more positive school-related outcomes (Fredricks & Eccles, 2006a; Metsäpelto & Pulkkinen, 2012) or higher civic engagement (Gardner et al., 2008) is associated with it. The reason for this is likely to be that it takes several years to practice and master OLTA-specific skills or to build supportive relationships with non-familial adults and peers.

#### 1.3.4 Gender, age and family-related differences in the rates participation in organized leisure-time activities and its outcomes

Participation in OLTA is affected by characteristics of adolescents themselves and their family context. First, levels of participation generally decline with increasing age regarding both intensity and breadth (Denault & Poulin, 2009; Eisman et al., 2017). Second, it has been shown that the amount of leisure is gender-specific, and boys have more leisure time than girls do (Hilbrecht et al., 2008). Furthermore, boys spend more time in organized activities or less time doing family chores (Wolf et al., 2015). In this sense, the developmental outcomes of participation seem to vary by gender, as indicated by the results of Bradley and Inglis (2012) that social leisure predicted adjustment more in females. Also, the associations between OLTA involvement and risk behaviours tend to differ by gender, and the majority of previous research reports boys benefiting more from such involvement (Fredricks & Eccles, 2006b; Metzger et al., 2011) in terms of lower exposure to risk behaviours.

Moreover, participation in OLTA varies by factors of family environment, too. Adolescents from families with lower income and parental education are less likely to participate in organized forms of leisure (Holloway & Pimlott-Wilson, 2014; Mahoney et al., 2006; Weininger et al., 2015), as are as those from incomplete or reconstituted families (Chesters & Smith, 2015; McMillan et al., 2016). In addition to family structure and socioeconomic status, parents care about their children's leisure and seem to value especially organized activities (Kleiber & Powell, 2005). They perceive them as an 'investment in the future' (Holloway & Pimlott-Wilson, 2014). This is in line with appreciated purposeful nature of some leisure activities, which parents perceive as a means for their children to adopt healthy habits and values (Shaw & Dawson, 2001). This is underscored by the fact that rates of participation have been found to be higher in families with good parent-adolescent relationships, in which parents ensure emotional support to their children (Bohnert et al., 2007; Simpkins et al., 2005).

#### 1.3.5 Why are organized leisure-time activities thought to be beneficial?

While PYD theory, as a developmental/psychological concept, provides a broader framework of healthy development through resources of the context, some authors have focused on more in-depth mechanisms that contributed to the supposed beneficial effects of OLTA participation. Larson and his colleagues (Hansen et al., 2003; Larson, 2000; Larson et al., 2006) proposed some possible explanations for the assumed beneficial effects of the participation and ascribed them especially to the development of initiative. Consequently, they studied the prerequisites for initiative development in three important contexts in which youth spend their time – school, unstructured leisure and OLTA (Hansen et al., 2003).

The school is considered to be an essential developmental context in children and adolescents and to be closely linked both to future success (Deary et al., 2005; Strenze, 2007) and health and well-being (Bradley & Greene, 2013; Suhrcke & de Paz Nieves, 2011). However, adolescents experience

relatively high levels of challenge and concentration in the school setting (in spite of difficulties in concentrating) but only low levels of intrinsic motivation. Conversely, the domain of unstructured leisure (e.g. time spent with friends or TV watching) is characterized by higher levels of intrinsic motivation but low level of challenge and concentration. In contrast, organized leisure-time activities provide adolescents with both high levels of challenge and concentration and intrinsic motivation. This is believed to foster initiative – labelled as a driving force for healthy development and a key prerequisite for a successful future (Larson, 2000). This assumption has also been supported empirically by comparing learning experiences in organized activities with learning experiences in academic classes and in socializing with friends (Hansen et al., 2003). The authors found that OLTA provided youth with important developmental experiences significantly more frequently than in the other two contexts. These experiences concerned development initiative, identity exploration, emotional learning, building of team-work skills and social capital (Hansen et al., 2003).

Other possible mechanisms linking OLTA to healthy development include gaining non-cognitive skills (Covay & Carbonaro, 2010), learning goal orientation (Fischer & Theis, 2014) and the channelling of stress-reduction efforts (Darling, 2005) or formation of supportive social networks with peers and adults (Crean, 2012; Schaefer et al., 2011). These attributes can then be transferred to other domains of adolescents' lives and help them better cope with e.g. school obligations or avoid risk behaviours in order to stabilize their social position (Viau et al., 2015).

#### 1.4 Unstructured activities

In contrast to participation in OLTA, excessive engagement in unsupervised and unstructured activities, in particular with peers, is frequently associated with problematic outcomes (Osgood et al., 2005; Weerman et al., 2015). These are often labelled as risky, because youth who spend a lot of time in activities with no or low structure have been shown to engage in more problem behaviours and antisocial behaviours (Mahoney & Stattin, 2000; Osgood et al., 2005). Youth engaging in such activities have been reported to have higher rates of delinquency (Hoeben & Weerman, 2016; Persson et al., 2007; Weerman et al., 2015), substance use (Kiesner et al., 2010) or poorer psychological adjustment (Trainor et al., 2010).

However, two notions must be raised when speaking about unstructured leisure. First, unstructured leisure does not automatically mean risky or negative for development (Osgood et al., 2005; Sharp et al., 2015). There are various opportunities for things to do in unsupervised time and perhaps nobody would label, for instance, reading a book as a meaningless, not to say, a negative activity. Similarly, Bradley (2010) concluded that skate parks can offer a considerable potential for positive youth development. The unstructured activities that actually receive a label of being risky/problematic are characterized by: socializing with peers, being adult-unsupervised, a lack of skill-building aims or taking place in public (Mahoney et al., 2004; Osgood et al., 2005; Weerman et al., 2015).

Second, organized (highly structured) and unstructured activities obviously are not mutually exclusive categories of leisure time. Some studies observed that a notable portion of those participating in organized activities were concurrently involved in a range of unstructured activities, yet showing better psychological and behavioural functioning (Sharp et al., 2015). The issue of structured and unstructured leisure is obviously a more complex phenomenon and as suggested by Persson et al. (2007), adolescents' positive social context (family and peers) might have a protective role both in choice of activities and the later behavioural outcomes.

#### 1.5 The scientific niche for the present thesis

A number of as yet unsolved scientific questions will be addressed in this thesis. First, most of the research thus far focusing on adolescents' participation in OLTA and various developmental outcomes has been conducted in the U.S. (alternatively also in Canada - e.g. Denault and colleagues, Australia - e.g. Barber and colleagues, or South Africa - e.g. Caldwell and colleagues). European research on this topic is scarce. Unlike in the field of organized sport or physical activity, no European research to the best of our knowledge has dealt systematically with general organized leisure-time activities. Although some authors from Europe have reported on adolescents' OLTA participation (e.g. Fischer & Theis, 2014; Leversen et al., 2012; Metsäpelto & Pulkkinen, 2012; Zambon et al., 2010), this 'only' regarded

findings on specific outcomes, such as life satisfaction, substance use or school achievement. A more comprehensive picture of European adolescents' participation in OLTA therefore is mostly still lacking. Moreover, studies on Central Europe (or more precisely, the Visegrad countries) are unavailable, except for the Polish data, which was included in the cross-national study of Zambon et al. (2010). Taking differences between the U.S. and Europe regarding culture, as well as leisure-time contexts into account, as briefly outlined by Metsäpelto and Pulkkinen (2012), this field offers quite significant research gaps to be filled using data from Europe.

Moreover, some of the associations between organized activity participation and its outcomes (e.g. bullying, non-familial support or self-rated health) or determinants (e.g. joint family leisure), as addressed in the further chapters of this thesis, have been seldom researched before. Similarly, the extent to which developmental outcomes differ for those involved only in OLTA and those involved in unstructured activities at the same time remains mostly unknown.

## 1.6 Aims of the thesis and research questions

The main aim of the present thesis is to examine the associations of adolescents' participation in organized leisure-time activities with health- and school-related outcomes in the context of the family environment. The thesis further aims to investigate if participation in OLTA can 'buffer' the negative outcomes of involvement in unstructured activities. Finally, we also assess whether gender, age and particularly the pattern of involvement in organized leisure-time activities modify the associations with health- and school-related outcomes in adolescents.

These aims were translated into five research questions (RQ):

### RQ1

Do family environment factors relate to adolescents' participation in organized leisure-time activities?

### RQ2

Is participation in organized leisure-time activities associated with adolescents' physical and mental health?

### RQ3

Is participation in organized leisure-time activities associated with adolescents' substance use, violent behaviours and injuries?

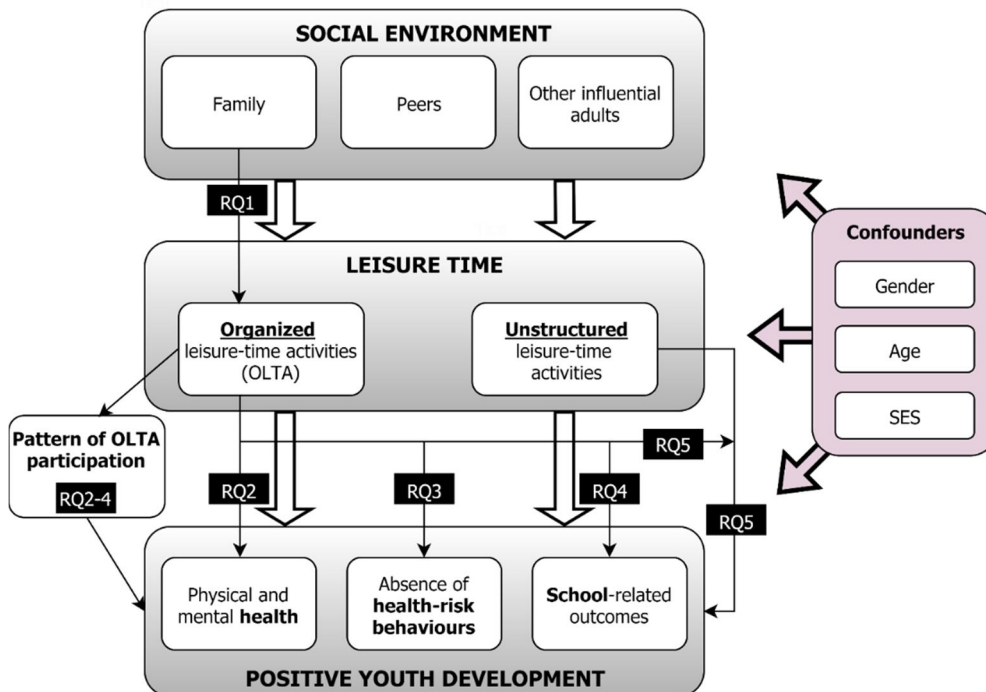
### RQ4

Is participation in organized leisure-time activities associated with adolescents' school functioning?

### RQ5

Is involvement in unstructured activities associated with health-risk behaviours and school performance, and to what extent does participation in organized leisure-time activities modify these associations?

Figure 1.2 Model of the associations assessed in the thesis



OLTA – organized leisure-time activities; RQ – research question; SES – socioeconomic status  
 → research question; ⇨ assumed causal relationship



## 1.7 Outline of the thesis

Chapter 1 presents the general information and theoretical rationale regarding the fundamental constructs of the thesis, including leisure time, organized and unstructured leisure-time activities. This chapter also contains the aims of the thesis, related research questions and theoretical model of the associations explored.

Chapter 2 describes the research sample used in the thesis, the measures used and the methods of statistical analyses applied to answer the research questions.

Chapter 3 examines the associations between three factors of the family environment and participation in organized leisure-time activities.

Chapter 4 presents the gender and age differences in rates of participations in organized leisure-time activities per activity type, as well as number of activities done concurrently. It then explores the patterns of organized leisure-time activity participation and assesses the associations with self-rated indicators of physical and mental health.

Chapter 5 assesses the associations of organized leisure-time activity participation with substance use, violent behaviours, injuries and truancy.

Chapter 6 investigates the associations of organized leisure-time activity participation with school engagement, academic achievement, school-related stress and acquisition of non-familial support with schoolwork.

Chapter 7 examines the associations of involvement in unstructured leisure-time activities with health-risk behaviours and school performance. Furthermore, it assesses the degree to which concurrent participation in organized leisure-time activities modifies these associations.

Chapter 8 summarises the key findings of the Chapters 3-7, which are discussed in the context of contemporary scientific research. The chapter also highlights the strengths and limitations of the thesis, as well as implications for practice, policy and future research.

The second chapter presents information regarding the study sample (2.1), measures (2.2) and methods of statistical analyses (2.3) used in the thesis.

## 2.1 Study samples and procedures

The design of the study is cross-sectional, with the study sample for the present thesis coming from a single source surveyed at a single point in time. The data for Chapters 3-7 was derived from the Health Behaviour in School-aged Children (HBSC) study conducted in the Czech Republic between April and June 2014. The HBSC is a large cross-national study collecting data on health and health-related behaviours and their social determinants among 11-, 13- and 15-year-old adolescents (Inchley et al., 2016). The first survey was conducted in England, Finland, Norway, Denmark and Austria in 1983/84, and since 1985/86 it has been repeated periodically in 4-year intervals. Currently, the network involves 48 member countries/regions from Europe, North America and Asia ([www.hbsc.org](http://www.hbsc.org)).

To enable cross-national comparison of data, all the member states are obliged to comply with the international research protocol. This, apart from e.g. joint instructions on data collection procedures, means they must administer the identical set of *mandatory standardized questions* and can also select questions from the pool of so-called '*optional packages*'. Furthermore, individual countries are allowed to include '*national questions*' investigating research topics of particular national interest.

In the Czech 2013/2014 wave of HBSC data collection, schools were the primary sampling unit. They were randomly selected from the database of the Ministry of Education, Youth and Sports of the Czech Republic. The selection was stratified by 14 administrative regions of the Czech Republic to be nationally representative. Moreover, the ratio of primary schools and secondary grammar schools was taken into account. Out of the 243 schools that were addressed to participate in the study, one school refused to get involved and was replaced by another one located in its proximity. The school-level response rate was 99.6%. At each of these schools one class from the 5<sup>th</sup>, 7<sup>th</sup> and 9<sup>th</sup> grades (and respective grades at secondary schools) was then again chosen at random. These grades are, in general, attended by pupils aged 11, 13, and 15 years.

In total, 16,298 pupils were registered in the selected classes and 14,569 of them were present in the schools at the time of the pen-and-paper questionnaire survey. Thirty pupils refused to complete the questionnaire. The final response rate was 89.2%. After cleaning the data (e.g. excluding those with missing responses on gender and age or with missing data regarding the key variable – organized leisure-time activity participation) and selecting only those aged eleven (11.0-11.99 years), thirteen (13.0-13.99 years) and fifteen (15.0-15.99 years), the basic sample for the thesis concerned 10,503 adolescents.<sup>1</sup> More detailed information regarding the sampling procedure is presented in Figure 2.1. The basic demographic characteristics of the sample are shown in Table 2.1. The design of the studies in Chapters 3-7 was approved by the Ethics Committee of Palacký University Olomouc (reg. no. 17/2013 and 57/2014).

Data collection was carried out during regular school time during a single lesson (45 minutes) in the absence of a teacher. Participation was voluntary and anonymous, with no incentives offered to the respondents. The parents or legal guardians of the adolescents were notified about the study, its content and purpose via school management and could withdraw their child, if they disagreed.

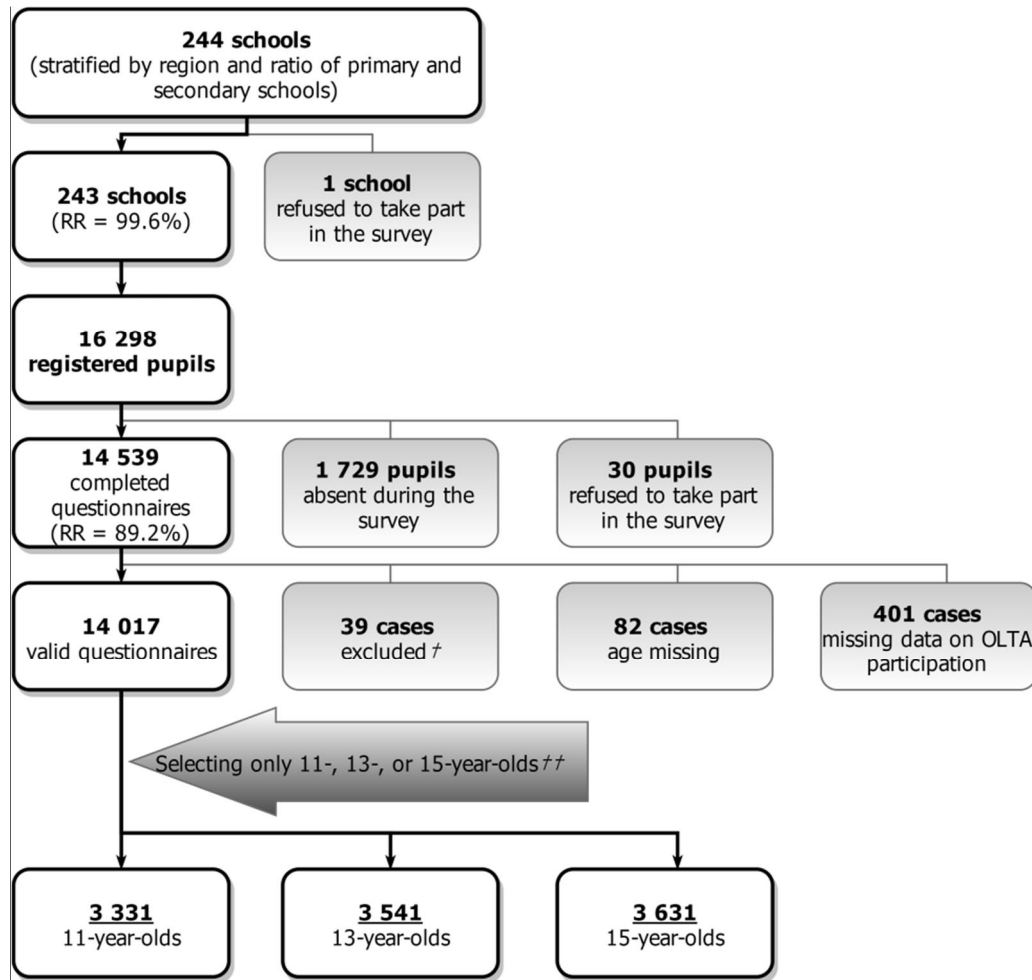
The Czech 2013/2014 HBSC questionnaire had five versions – one for 11-year-olds, two for 13-year-olds and two for 15-year-olds. All versions contained an identical set of mandatory questions and varied only regarding the optional and national items. The versions for 13-year-olds comprised more

---

<sup>1</sup> Please note that the samples presented in chapters 3, 5, 6 and 7 slightly differ from the overall sample. This is due to missing data regarding dependent (e.g. school-related outcomes in the Chapter 6), or independent variables (e.g. family environment factors in the Chapter 3), or the presence of the particular measures only in some questionnaire versions.

questions than the one for 11-year-olds, and the version for 15-year-olds even more. The two distinct versions for 13- and 15-year-olds, respectively, were used to cover as many research topics as possible while bearing in mind the age-appropriate length of the questionnaire. This design caused some of the measures used in the thesis to not be present in all the questionnaire versions (see Table 2.2).

Figure 2.1 Flowchart of the research sample selection for the present thesis (2013/2014 HBSC study in the Czech Republic)



OLTA – organized leisure-time activities; RR – response rate.

† 39 questionnaires were excluded during their visual checking prior to their transformation to the electronic dataset.

†† 5 respondents were excluded because of reporting an age outside the valid range for a given grade, e.g. a 15-year-old completing the version for 11-year-olds.

Table 2.1 Demographic characteristics of the study sample (2013/2014 HBSC study in the Czech Republic)

	Boys		Girls		Age (years)	
	n	%	n	%	M	SD
11-year-olds	1626	48.8	1705	51.2	11.42	0.27
13-year-olds	1741	49.2	1800	50.8	13.42	0.26
15-year-olds	1804	49.7	1827	50.3	15.42	0.27
TOTAL	5171	49.2	5332	50.8	13.48	1.65

## 2.2 Measures

The section provides readers with information regarding the specific measures used in the thesis and the role they played in the analyses of the associations explored. A brief description of the measures is presented in Table 2.2.

## 2.3 Statistical analyses

Several methods of statistical analysis were used across the present thesis. All analyses were carried out using IBM SPSS v22.0 for Windows (IMB Corp. Released 2013), except for the multilevel analyses in Chapter 5, which were done in the MLwiN Version 2.02 (Centre for Multilevel Modelling, University of Bristol). A detailed description of the particular methods is presented in each of Chapters 3-7.

In general, we firstly described the prevalence rates of the respective dependent and independent variables, usually overall and stratified by gender and age category. The statistical significance of the gender and age differences per variable of interest was determined using the chi-square tests. Next, to give an answer to each of the research questions, we assessed the associations between dependent and independent variables by logistic regression models – crude and also adjusted for confounders (gender, age category and family affluence indicating socioeconomic status). To assess, whether the associations varied by gender and/or age category, the interactions of gender and age category, respectively, with selected independent variables were tested. To retrieve adolescents' patterns of involvement in organized leisure-time activity, which were supposed to modify the associations, a cluster analysis was performed (see Methods in Chapter 4).

Table 2.2 Measures used in the thesis

Measure	Role in analyses	Variable type	Chapter(s)	Indicator of:
Organized leisure-time activities	Independent	Dichotomous/Categorical	4, 5, 6	leisure-time activities
	Dependent	Dichotomous	3	
	Interaction term	Dichotomous	7	
Family support	Independent	Dichotomous	3	family functioning
Joint family activities	Independent	Dichotomous	3	family functioning
Presence of screen-time rules	Independent	Dichotomous	3	family functioning
Self-rated health	Dependent	Dichotomous	4	health
Life satisfaction	Dependent	Dichotomous	4	health
Health complaints	Dependent	Dichotomous	4	health
School engagement	Dependent	Dichotomous	6	school functioning
Academic achievement	Dependent	Dichotomous	6, 7	school functioning
School-related stress	Dependent	Dichotomous	6	school functioning
Non-familial school support††	Dependent	Dichotomous	6	school-related social capital
Smoking status	Dependent	Dichotomous	5, 7	substance use
Alcohol consumption	Dependent	Dichotomous	5	substance use
Drunkenness	Dependent	Dichotomous	5, 7	substance use
Bullying	Dependent	Categorical	5	violent behaviour
Physical fighting	Dependent	Dichotomous	5	violent behaviour
Injuries	Dependent	Dichotomous	5	violent behaviour
Truancy	Dependent	Dichotomous	5	norm-breaking behaviour
Sexual intercourse††	Dependent	Dichotomous	7	health-risk behaviour
'Risky' unstructured activities†	Independent	Composite/Dichotomous	7	leisure-time activities
Family affluence	Confounder	Categorical/Continuous	3, 5, 6, 7	socioeconomic status

† the questions were asked only to approximately half of the 13- and 15-year-olds; †† the item on sexual intercourse was present only for 15-year-olds

## Do family environment factors play a role in adolescents' involvement in organized activities?

Petr Badura, Andrea Madarasova Geckova, Dagmar Sigmundova, Erik Sigmund, Jitse P. van Dijk, & Sijmen A. Reijneveld

*Published as: Journal of Adolescence, August 2017, Volume 59, pp 59-66*

### Abstract

The study assessed the association of family environment factors with adolescents' participation in organized leisure-time activities (OLTA). We used data on 10,472 Czech adolescents aged 11-15 years (49.2% boys) from the 2013/2014 Health Behaviour in School-aged Children study. The associations of family support, the presence of parental screen-time rules and joint family activities with participation in at least one OLTA were assessed using logistic regression. High family support and the presence of parental screen-time rules were associated with higher odds of OLTA participation. Moreover, adolescents playing sports, indoor games and going for walks with their families at least weekly were more likely to participate in OLTA. Conversely, those spending time in joint family TV/video watching on most days were less likely to do so. A supportive family environment and direct parental involvement in their adolescent children's leisure are associated with OLTA participation in early to middle adolescence.

### Keywords:

Adolescence, Extracurricular activities, Parental control, Family support, Joint family activities, Sports

## Introduction

When adolescents attempt to explore their own identity and gain more independence from their parents (Koepeke & Denissen, 2012), the parent-child interaction starts to change. Youth tend to spend more time with peers and start to form cliques (Gifford-Smith & Brownell, 2003; Larson & Verma, 1999). This happens at the expense of shared family time, which becomes rarer with increasing age (Vokacova et al., 2016; Zaborskis et al., 2007). Consequently, parental control and knowledge about their children's friends and activities decreases, and adolescents might disclose less to their parents (Keijsers & Poulin, 2013).

Parents, however, continue to be essential for healthy adolescent development (Viner et al., 2012), despite the natural process of children separating from parents. Parents influence most aspects of an adolescent's life, including the content of their leisure time. They seem especially to value organized leisure-time activities (OLTA) as a meaningful way of their children's spending their after-school hours (Weininger et al., 2015). Parents across social strata, besides appreciating that participation in OLTA yields instant benefits (being fun and healthy for their children), perceive them as an 'investment in future' (Holloway & Pimlott-Wilson, 2014).

Indeed, OLTA have been both theoretically and empirically linked to healthy youth development (Lerner, 2005). Adolescents participating in OLTA report having better physical and mental health (Badura et al., 2015; Zambon et al., 2010), performing better at school (Badura et al., 2016; Fredricks, 2012), and having higher educational aspirations (Beal & Crockett, 2010; Chesters & Smith, 2015). They also engage less in risky behaviours (Takakura, 2015; Zambon et al., 2010). Parents' beliefs in the positive long-term effects of structured leisure time are also supported by studies showing that participation in OLTA leads to better later educational attainment (Beal & Crockett, 2010; Martin et al., 2015).

Excessive engagement in unstructured and unsupervised leisure activities, in contrast, is often associated with problematic outcomes. Unstructured peer-oriented activities might be related to higher rates of delinquency (Weerman et al., 2015), substance use (Kiesner et al., 2010) or poor psychosocial adjustment (Trainor et al., 2010). This applies especially to adolescents from families with low levels of parental monitoring (Kiesner et al., 2010; Kristjansson et al., 2010). In addition, positive feeling about adolescents' own family decreases the likelihood of joining such activities, or buffers the potential risks of joining them (Persson et al., 2007).

Rates of participation in OLTA vary certainly depending on several features of the family environment. Youth from incomplete or reconstituted families are less likely to participate in OLTA (Chesters & Smith, 2015; McMillan et al., 2016), while those from families with higher income and parental education are more likely to do so (Holloway & Pimlott-Wilson, 2014; Mahoney et al., 2006; Weininger et al., 2015). However, family functioning and climate appear to play their roles too, besides family structure and socioeconomic status. The quality of parent-adolescent relationships has been shown to promote adolescents' OLTA participation (Bohnert et al., 2007). Similarly, rates of OLTA participation are higher in families in which parents provide emotional support and encourage their children to participate (Mahoney & Eccles, 2005; Simpkins et al., 2005). It has been suggested that the family environment enhances OLTA participation through multiple mechanisms, ranging from affecting adolescents' cognitions (Bohnert et al., 2007) over parents' own involvement in leisure-time activities to simple material support (Simpkins et al., 2005). This indicates that the role of parents in adolescents' leisure-time choices is very complex and distinct factors of the family environment act as important determinants of adolescents' involvement in OLTA.

Since OLTA participation is linked with a range of healthy developmental outcomes (Bohnert et al., 2010), it is of interest to better understand what particular parental actions could potentially promote such participation. However, studies on the topic are rare. To the best of our knowledge, none of the studies thus far has also focused on shared family time – particular joint family activities – in combination with OLTA participation in adolescents. In the present study we assessed whether there is an association of family support, presence of parental rules and joint family activities with adolescents' OLTA participation. Based on the existing evidence, we assumed that adolescents whose parents are supportive of them, regularly spend time in joint leisure-time activities with them, and impose rules limiting time spent at the screen, would be more likely to participate in OLTA. Moreover, given the reported gender and age differences in both adolescents' relationships with parents (Kenny

et al., 2013; McGue et al., 2005) and their OLTA participation (Badura et al., 2015; Mahoney et al., 2006), we also assessed whether gender and age moderated these associations.

## Methods

### *Sample and procedure*

The data for this study were collected between April and June 2014 within the Health Behaviour in School-Aged Children (HBSC) study in the Czech Republic. After stratification by region and type of school (the ratio of primary vs. secondary schools), 244 schools were selected at random from the database of Ministry of Education, Youth and Sports of the Czech Republic, and 243 out of them agreed to take part in the survey (response rate 99.6%). One class from the 5<sup>th</sup>, 7<sup>th</sup> and 9<sup>th</sup> grades was then randomly selected at each of the schools. Trained research assistants administered the questionnaires during regular class time. The teacher was absent from the classroom at the time of the survey in order to reduce response bias. Participation in the study was voluntary and anonymous and respondents were not offered any incentives to participate. Prior to administration of the questionnaires they were informed about the opportunity to opt out. The study design was approved by the Ethics Committee of the Faculty of Physical Culture, Palacky University, Olomouc (No. 57/2014).

Out of 16 298 students registered in the classes enrolled in the survey, we collected questionnaires from 14,539 (response rate 89.2%); 1 732 were absent from school at the time of the survey (mostly due to illness) and 30 pupils declined to participate. Then, according to the HBSC protocol, only the 11-, 13-, and 15-year old adolescents were selected (n=10 795). Finally, we excluded respondents who failed to report data on gender, all six OLTA items and all family environment variables, and those who provided several unlikely responses throughout the HBSC questionnaire (such as contradictory responses on substance use in the past month versus lifetime). Moreover, we excluded those whose age did not correspond with the grade they attended (e.g. a 15-year-old completing the questionnaire version for 11-year-olds). This led to the final sample of 10 472 adolescents (49.2% boys).

### *Measures*

We investigated participation in six types of OLTA (team sports, individual sports, art school, youth organizations, leisure centres or after-school clubs, and church meeting/singing) with a dichotomous response of *yes/no* (Bosakova et al., 2016). The participants were then categorised as *active* (involved in at least one OLTA) or *inactive* (not involved in any OLTA).

Items on the family environment represented independent variables in the analyses. We used the family support subscale from the Multidimensional Scale of Perceived Social Support (Zimet et al., 1988). The subscale consists of four items, with seven response categories ranging from *Strongly disagree* (1) to *Strongly agree* (7). The responses were summed up, divided by four and then dichotomized as those perceiving *high support* (5.1-7.0) vs. the remaining respondents, i.e. those perceiving *moderate* (3.0-5.0) or *low support* (1.0 – 2.9) as proposed by the developer of the scale (Zimet, 2016). The family support subscale showed an internal consistency in our sample with a Cronbach's  $\alpha$  of 0.90.

Joint family activities were measured using a list of eight activities that adolescents do with their parents in their leisure time (Sweeting et al., 1998), with five response categories (*everyday, most days, about once a week, less often, never*). These activities were dichotomized according to the trend studies on the topic (Vokacova et al., 2016; Zaborskis et al., 2007) as *about once a week or more often* vs. *lower frequency*, except for joint TV watching and eating a meal together (*most days or more often* vs. *lower frequency*).

Finally, we assessed parental rules regarding screen-time of their children using 3 items. The participants were offered four response categories (*never, rarely, usually, always*) to report how often their parents limit the time spent (a) *watching TV*, (b) *playing PC games*, and (c) *on the Internet (except for schoolwork)*. The participants were then split into two groups – those having at least one of the rules applied usually or always vs. those with such rules applied only rarely or never.

The Family Affluence Scale (FAS), as a covariate, was used to measure socioeconomic status of the respondents' families (Currie et al., 2014). The scale examines the *number of cars owned by the family, having one's own bedroom, number of computers in the household, number of foreign family*



*holidays, number of bathrooms, and dishwasher ownership*. The summary score (0-13) was converted into a fractional rank (ridit) score, in line with a recent large-scale cross-national study on socioeconomic inequalities (Elgar et al., 2017). This scoring effectively transforms ordinal data to an interval scale with a normalised range (from 0 to 1, with higher score indicating higher socioeconomic position) and distribution. The use of the ridit scoring was recommended within the HBSC network because it facilitates cross-national comparison of findings.

### *Statistical analysis*

First, we described the composition of the sample, its OLTA participation, self-reported family support, frequency of joint family activities and parental rules. Gender- and age-differences in these family environment variables were assessed using chi-square tests. Next, we analysed the associations between the family environment variables and adolescents' OLTA participation using multiple logistic regression models. We first assessed the crude associations of perceived family support, a set of eight joint family activities, and the presence of at least one parental rule, with OLTA participation as a dependent variable. Second, the analyses were adjusted for gender, age categories and socioeconomic status, as indicated by FAS.

To assess the stability of our results, we ran the analyses again using number of OLTA in which adolescents participated concurrently and also the pattern of OLTA involvement, i.e. the combination of distinct types of OLTA they were involved in, derived by cluster analysis (Badura et al., 2015), as outcomes. This led to very similar results. For the sake of brevity, we decided to use the simple dichotomised measure of OLTA participation in line with Persson et al. (2007). Similarly, we assessed the impact of dichotomisation for the independent variables. We did factor analyses for joint family activities (8 items) and parental screen-time rules (3 items). In both cases, we obtained a single factor, and the latent factors were associated with a higher rate of OLTA participation in the same manner as the dichotomous measures. Next, we also repeated the analyses using alternative categorizations of FAS (categorised fractional rank score and categorised summary score), which again yielded virtually the same findings.

Last, we checked the interaction effects of gender and age on these associations. The interaction terms of gender with all the family environment variables were entered into the multiple regression model simultaneously. Next, the same was done for categorised age. IBM SPSS 22 for Windows (IBM Corp. Released 2013. Armonk, NY) was used for statistical analyses.

## Results

About 20% of the adolescents (n=1 965) were not involved in any OLTA. Prevalence rates of self-reported family support, joint family activities and parental rules by gender and age are shown in Table 3.1. The vast majority of the respondents perceived high support from their families. Eating a meal and watching TV/video were the most frequent activities done together with parents, while playing sports and going places were the least frequent activities. Approximately 55% of adolescents had at least one screen-time rule imposed by their parents, with rules restricting the time spent on the PC being reported as the most common. The number of adolescents reporting high family support, regularly spending time in joint family activities and restricted by one or more parental rules was, in general, higher in boys and decreased with age.

Table 3.1 Adolescents' OLTA participation, family support, joint family leisure-time activities and parental rule setting: rates by gender and age

	Gender				Age*						no. of missing values
	Boy		Girl		11		13		15		
	n	%	n	%	n	%	N	%	n	%	
OLTA participation											
at least one activity	4225	82.0	4282	80.5	2886	87.1	2954	83.6	2667	73.6	0
Perceived family support											
high family support	4279	83.9	4205	79.4	2894	88.1	2851	81.2	2739	76.0	70
Joint family activities (about once a week)											
watch TV/video †	2935	57.2	2967	55.9	2141	64.9	2011	57.1	1750	48.4	39
play indoor games	2126	41.6	1894	35.8	1840	55.9	1386	39.4	794	22.0	61
eat a meal †	3261	63.8	3077	58.3	2374	72.3	2213	63.2	1751	48.6	82
go for a walk	2468	48.4	2624	49.6	2129	65.0	1763	50.3	1200	33.2	87
go places	1855	36.4	1782	33.8	1399	42.8	1292	36.8	946	26.3	93
visit friends/relatives	3316	64.9	3399	64.2	2332	71.0	2329	66.3	2054	57.0	72
play sports	1896	37.2	1805	34.1	1502	45.8	1262	36.0	937	26.0	81
sit & talk together	3275	64.0	3487	65.8	2324	70.7	2245	63.8	2193	60.7	54
Parental rules (always or usually)											
limited TV	2000	39.0	1832	34.5	1730	52.6	1406	39.9	696	19.3	43
limited PC gaming	2669	52.3	2103	39.9	2057	62.9	1743	49.6	972	27.0	92
limited Internet	1992	39.0	1909	36.2	1741	53.2	1380	39.4	780	21.7	98
at least one rule	3010	59.3	2611	49.9	2352	72.6	2057	58.9	1212	33.9	158

Statistically significant ( $p < 0.05$ ) differences by gender are indicated in bold – based on  $\chi^2$  tests.

\*all differences both between 11-year-olds and 13-year-olds, as well as 13-year-olds and 15-year-olds were statistically significant ( $p < 0.05$ ) regarding all the variables in the Table – based on  $\chi^2$  tests.

† the relative number of adolescents engaged in 'watching TV/video' and 'eating a meal' on most days or more often is presented, unlike in other joint family activities.

Table 3.2 shows odds ratios (OR) and 95% confidence intervals (CI) for the associations of all family environment factors simultaneously with OLTA participation by multiple logistic regression. In the crude analyses, we observed six out of the eight joint family activities to be significantly associated with adolescents' OLTA participation in the case of high family support and the presence of at least one screen-time rule. Adjustment for gender, age and FAS resulted in rather minor changes of the ORs of the explored associations. Accordingly, changes in statistical significances were also small; only the associations of joint eating of meals and visiting friends/relatives with OLTA participation became non-significant, as compared with the crude model. We found that adolescents involved in sports, playing indoor games and going for walks with their families at least weekly were more likely to participate in OLTA, with joint sports showing the strongest association (OR 1.81, 95% CI 1.57-2.07). Additionally, when having one or more screen-time rules and perceiving high support from their family, they had higher odds of participating in OLTA, as well. In contrast, youth who engaged in joint family TV/video watching on most days were less likely to be OLTA participants (OR 0.84, 95% CI 0.75-0.94).

Table 3.2 Associations of family environment factors with organized leisure-time activities participation: odds ratios (OR) and 95% confidence intervals (CI) for being involved in organized leisure-time activities resulting from multiple logistic regression analyses

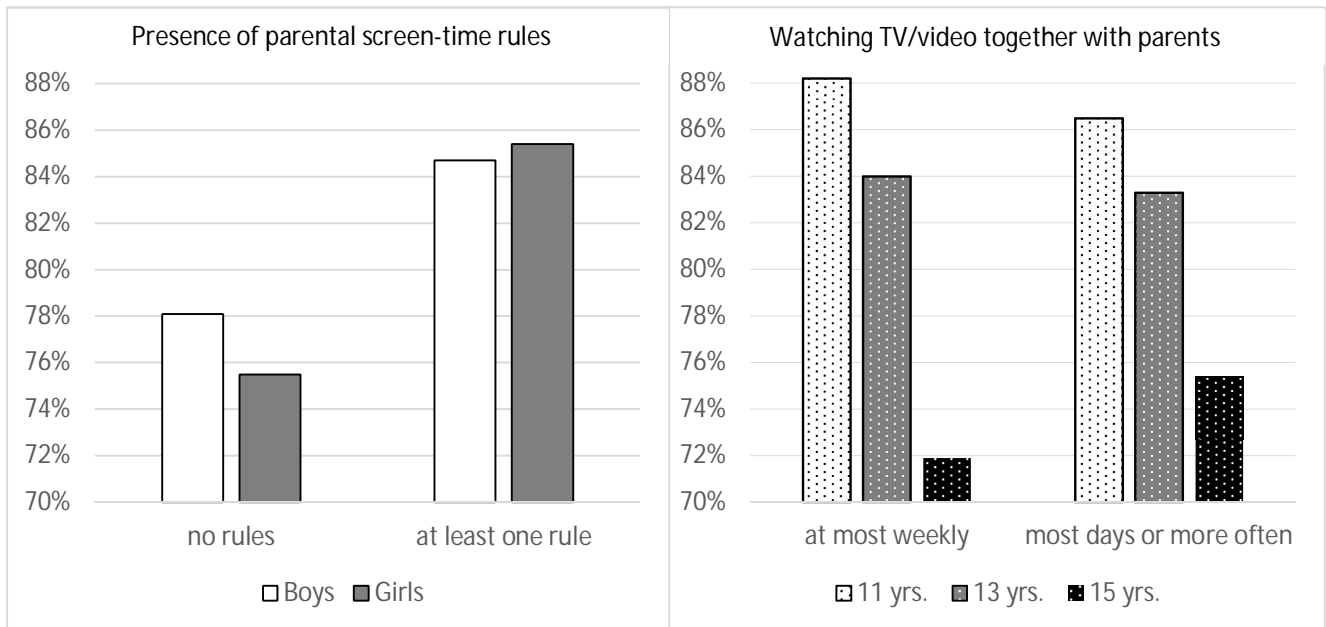
	OR	Crude 95% CI	Adjusted for gender, age and FAS OR	Adjusted for gender, age and FAS 95% CI
Perceived family support				
high family support	1.25***	1.10-1.42	1.19**	1.04-1.36
Joint family activities				
watch TV/video (most days or more often)	0.83***	0.74-0.92	0.84**	0.75-0.94
play indoor games (at least once a week)	1.31***	1.15-1.49	1.23**	1.08-1.41
eat a meal (most days or more often)	1.18**	1.05-1.32	1.08	0.97-1.22
go for a walk (at least once a week)	1.23**	1.09-1.40	1.21**	1.06-1.37
go places (at least once a week)	1.08	0.94-1.23	1.01	0.88-1.15
visit friends/relatives (at least once a week)	1.13*	1.01-1.26	1.11	0.99-1.24
play sports (at least once a week)	1.98***	1.72-2.26	1.81***	1.57-2.07
sit & talk together (at least once a week)	1.00	0.89-1.12	1.05	0.94-1.19
Parental rules				
at least one parental rule	1.43***	1.28-1.59	1.34***	1.20-1.50

Statistically significant odds ratios are indicated in bold and by asterisks (\*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ ); FAS - Family Affluence Scale; 622 cases missing in the model adjusted for gender, age and FAS.

Last, we assessed the interactions of gender and age on the associations between family environment variables and OLTA participation in the fully adjusted model. We observed only one interaction with gender and only one with age. The other interactions were not statistically significant. Regarding the model on screen-time rules that included an interaction with gender, the ORs for main effects were 1.07 (95% CI 0.82-1.40) for girls vs. boys, and 1.20 (95% CI 1.02-1.41) for having at least one screen-time rule vs. none. The OR for the interaction of gender and screen-time rules was 1.25 (95% CI 1.01-1.56), for girls in families with screen-time rules. This indicates that the odds for OLTA participation of both girls and boys were higher in families with parental rules on screen time anyhow, but even more so for participation of girls.

Regarding the interactions of age categories with family environment variables, we found an interaction of age with watching TV/video with their parents. In particular, 11-year olds who did so at least weekly had higher odds for involvement in OLTA than those who did so more frequently (OR 1.47, 95% CI 1.10-1.98), unlike their 15-year-old counterparts. In this model, the OR for the main effect of age category (15-year-olds vs. 11-year-olds) was 0.51 (95% CI 0.34-0.77) and for the main effect of joint TV/video watching was 0.67 (95% CI 0.53-0.85). Figure 3.1 shows percentages of adolescents in cases where interactions of family environment factors with gender or age were statistically significant.

Figure 3.1 Rates of adolescents who reported participating in at least one organized leisure-time activity per family environment variables regarding family factors which had a significant interaction with gender (left) or age (right).



Note: The overall Wald test for the interaction term Age categorical \* joint TV/video watching was statistically significant ( $p=0.027$ ).

## Discussion

The present study was aimed at assessing the associations of family support, joint family activities and parental control of their children's screen-time with adolescents' involvement in OLTA. All three mentioned family environment factors were associated with adolescents' participation in at least one OLTA, mostly regardless of gender or age and with positive associations. Only regarding screen-time rules and frequent TV/video watching with parents did associations vary by gender and age, respectively.

We found that adolescents in general are more likely to be involved in OLTA when their parents pay more attention to the content of their leisure, are more supportive of them and share more time with them. This confirms what Jacobs and Eccles (2000) suggested, i.e. that parenting styles and socio-emotional environment created by parents may influence adolescents' OLTA participation. Our finding is also in line with previous research showing that parents' behaviours, including parental warmth and openness, encouragement and own activity involvement, promote the participation of adolescents in activities ranging from sports or extracurricular academic activities to volunteering (Denault & Poulin, 2008; Mahoney et al., 2006; Martin et al., 2015; Simpkins et al., 2005; Yao & Rhodes, 2015). A possible explanation for this might be that parents who are more interested and engaged in the content of their children's leisure also realise the opportunity to boost their cultural, as well as social capital through involvement in OLTA, as sometimes conceptualised in research (Jaeger & Breen, 2016) and also empirically supported (Covay & Carbonaro, 2010; Larson et al., 2006). Parents also appraise OLTA as 'safe places' because they are adult-supervised (Carver et al., 2010) and, thus, caring parents might see OLTA not only as developmental context, but also as a way to ensure the safety of their children.

Higher rates of OLTA participants were observed in families regularly spending time in joint activities. The joint family activities associated with adolescents' OLTA participation included playing sports, indoor games and going for walks, i.e. all the activities requiring a proactive attitude from parents. This finding extends those of Lam and McHale (2015). They found that parent-youth involvement in joint physical activities was associated with more time spent in such activities by adolescents. Parents seem to recognize shared family time as 'purposive leisure', as described by Shaw and Dawson (2001). Apart from valuing its enjoyable nature and facilitating effects on family interactions, parents engage in joint family activities to teach their children about healthy habits or values (Shaw & Dawson, 2001). Moreover, the skill-building character is also important for them,

although this factor gets more pronounced with higher socioeconomic status (Harrington, 2015). Therefore, our findings indicate that parents who perceive joint family leisure time as beneficial for their children's future also wish them to profit from the contents of further leisure time, i.e. through OLTA participation.

We found that frequent joint TV watching and the absence of screen-time rules was associated with lower odds for OLTA participation, which is, to a certain extent, complementary to the previously discussed finding. Parents intentionally discouraging their children from spending too much time in front of the screen (either PC or TV) might be more aware of the strong link between excessive screen time and subsequent health risks, such as unhealthy dietary habits (Pearson & Biddle, 2011), increased risk of overweight/obesity, decreased fitness and socio-cognitive abilities (Tremblay et al., 2011) or lower life satisfaction (Boniel-Nissim et al., 2015). As a consequence, such parents might guide their children towards a healthy and active lifestyle (Lawman & Wilson, 2012), with OLTA as an integral part of it. Moreover, it fits in the picture that parental monitoring in combination with OLTA is associated with a lower occurrence of risk behaviours (Kristjansson et al., 2010).

Lastly, we observed the interaction effects of gender and age on the association of screen-time behaviour and rules with OLTA participation, respectively. Compared with boys, girls were significantly less likely to be involved in OLTA when having no screen-time rules applied by parents. The rate of participation in OLTA grew more in girls than in boys when they had at least one such rule. It is known that beliefs in the legitimacy of parental authority decline more in boys than in girls during adolescence (Kuhn & Laird, 2011). Thus, girls might be more willing to accept both the rules limiting their screen-time and potential stimuli to participate in OLTA. In addition, the association between joint family TV/video watching and OLTA participation diminished from age 11 to 15 years, indicating that with increasing age some aspects of the family environment affect adolescents' lives to a lesser degree. Alternatively, it could also be that adolescents who are both active by themselves and together with parents, share common interests with them. Thus, they might still find more suitable programs to watch with their parents even when they get older, compared with inactive adolescents.

None of the other interactions of the independent variables with gender and categorised age was statistically significant, indicating that family environment factors are associated with OLTA participation relatively independently of adolescents' gender and age. Given the number of tests, the interactions as found could easily be due to chance. Likewise, Simpkins et al. (2005) reported relations between parental behaviour and their children's participation in academic extracurricular activities similar for boys and girls. Moreover, a lack of age variance in the associations is complementary to the results of Persson et al. (2007). They found that positive feelings about the family environment predicted a lower dropout from OLTA regardless of adolescents' age. It therefore seems that the creation of a supportive and cohesive family environment may help keep both adolescent boys and girls involved in OLTA even in this life period, in which rates of OLTA participation decrease (Badura et al., 2015). It also fits the picture that supporting the participation of one's children in OLTA is a common part of 'good parenting practices' (Trussell & Shaw, 2012).

### *Strengths and limitations*

The main strength of the present study lies in its large and representative sample. Moreover, we analysed data from the well-established and recognized HBSC study, which unconditionally complies with the international study protocol in terms of using a standardized questionnaire and data collection procedures.

However, our findings should also be interpreted in the light of some limitations. First, we cannot draw any definite conclusions on causality, as we worked with cross-sectional data. Second, all the measures were self-reported, which can be more prone to a respondents' bias (e.g. social desirability). However, the validity and reliability of the items used in the present study have, in general, been shown to be good (Bosakova et al., 2016; Zimet et al., 1988), or they have been used in previous research (Brindova et al., 2014; Zaborskis et al., 2007). Third, we used only a binary measure of OLTA participation (i.e. active vs. inactive), without information on the unique dimensions of OLTA (breadth, intensity, or engagement). These could have affected the associations observed. However, we repeated the analyses with OLTA as a total number of activities or pattern of involvement (the combination of distinct types of OLTA) and these analyses yielded results that were very similar to those using OLTA participation as a binary measure.

### *Implications*

Generally, the findings of the present study demonstrate associations between family environment factors and adolescents' OLTA participation. A supportive family environment and direct involvement of parents in the content of their children's leisure time are therefore not only beneficial by themselves regarding strengthening of family relationships or promotion of healthy habits in adolescents (Shaw & Dawson, 2001). They also seem to promote higher rates of OLTA participation. If causal, promotion of OLTA participation as a potential booster of school performance or a component of interventions against risk behaviours should also take adolescents' family environment into account. The focus should especially be on adolescents from less supportive and cohesive families because they appear to be disadvantaged regarding participation in OLTA.

Further research is needed on the causality between family environment factors and OLTA participation, in particular, with an emphasis on its other dimensions, such as OLTA pattern and intensity. Moreover, given the possibility of occurrence of suppression effects in the multiple regression, it would be also desirable to conduct replication studies that would support or falsify our findings. We would also recommend considering parent-reported data in addition to those of adolescents, as the parents' and adolescents' perception of family environment (e.g. regarding the rule-setting) might differ notably.

### Conclusion

Adolescents perceiving high family support, spending time with their parents on a regular basis in playing sports, indoor games or going for walks, and having at least one parental rule limiting their screen time are more likely to be involved in at least one OLTA. Conversely, those frequently spending time in joint family TV/video watching are less likely to be OLTA participants. This pertained to younger adolescents (11-years old) but not to their older counterparts. Otherwise, adolescents' gender, age and socioeconomic status hardly modified the associations. A supportive family environment and direct parental involvement in the content of their children's leisure time are associated with higher odds for participation in OLTA in early to middle adolescence.



## When children play, they feel better: Organized activity participation and health in adolescents

Petr Badura, Andrea Madarasova Geckova, Dagmar Sigmundova, Jitse P. van Dijk, & Sijmen A. Reijneveld

*Published as: BMC Public Health, October 2015, Volume 15, 1090*

### Abstract

*Background:* Participation in organized leisure-time activities (OLTA) has been linked to healthy youth development. This study aimed to assess whether participation in OLTA is associated with both physical and mental health in adolescents, and whether this association differs by pattern of activity participation, age and gender.

*Methods:* The present study was based on data from the 2013/2014 Health Behaviour in School-aged Children study in the Czech Republic. This data concerned 10,503 adolescents (49.2% boys) aged 11, 13 and 15. A cluster analysis was carried out to obtain patterns of activity participation and yielded five groups (all-rounders, artists, individual sports, team sports, and inactive). The association between participation in types of OLTA and physical and mental health was analysed using logistic regression models adjusted for age and gender. We also assessed interactions between types of OLTA and gender and age.

*Results:* Participation in OLTA was associated with better self-rated health and higher life satisfaction regardless of gender or age. Participation in team or individual sports was associated with better general health and less frequent health complaints in boys, while participation in art activities was associated with lower occurrence of health complaints in girls and 11-year-olds.

*Conclusion:* Participation in OLTA is associated with better physical and mental health in adolescents. The association varies by pattern of activity participation and is partly gender- and age-specific.

### Keywords:

Adolescence, Health, Extracurricular activities, Life satisfaction, Age differences, Gender differences, Sports, Arts



## Introduction

Organized leisure-time activities (OLTA) have been identified as a context allowing the individual strengths of adolescents to be aligned with developmental assets (Bowers et al., 2014; Geldhof et al., 2013; Lerner, 2005), which stimulates adolescents' thriving (Eccles et al., 2003; Larson, 2000; Mahoney et al., 2005; Ramey & Rose-Krasnor, 2012). OLTA represent a wide range of activities taking place during leisure time outside the regular school curriculum (Bohnert et al., 2010). They can be characterized as having a structure with defined rules and goals, being supervised by adults, having a regular schedule and putting emphasis on skill-building (Larson, 2000; Mahoney et al., 2005). Because of these qualities, OLTA are believed to contribute to healthy youth development in contrast to other ways of spending leisure time (Bartko & Eccles, 2003).

The association between health and organized activity participation has been explored as one of the relevant healthy youth development factors in adolescents (Bohnert et al., 2010; Farb & Matjasko, 2012). Evidence on the relation of OLTA with enhanced physical health is rare (Zambon et al., 2010). Research has focused mostly on mental health and several studies have documented that it is positively linked to organized activity involvement (Leversen et al., 2012; Mahoney et al., 2006), thus supporting the position of OLTA in healthy youth development.

The effects of activity involvement have been shown to vary by dimensions of OLTA, such as breadth, intensity, duration, or engagement (Bohnert et al., 2010), as well as by the type of activity (Hansen et al., 2010; Larson et al., 2006; Rose-Krasnor et al., 2006). The results of some of the studies also suggest age-specific (Agans et al., 2014; Arbeit et al., 2014) and gender-specific differences (Bradley & Inglis, 2012; Fredricks & Eccles, 2008) in the association between OLTA and adolescent development. However, evidence on such differences regarding health outcomes is lacking, as none of these studies specifically addresses this issue. Thus, OLTA may deserve a place in health promotion in adolescence, but up to now it has not really been clear if the factors of gender and age modify the health outcomes of activity participation. Resnick et al. (2012) call for evidence-based support of healthy adolescent development and highlight its benefits for future public health. Therefore, revealing the eventual effects of gender and age on association between OLTA and health of adolescents might provide a useful piece of information from a global health perspective. This study aimed to assess whether participation in OLTA is associated with both physical and mental health in 11-, 13-, and 15-year-old adolescents. Further, we aimed to analyse whether these associations differ by a specific pattern of activities, age and gender.

## Methods

### *Participants*

We obtained data on a nationally representative sample of Czech boys and girls aged 11, 13 and 15 years from the 2013/2014 Health Behaviour in School-Aged Children (HBSC) study. This cross-sectional World Health Organization collaborative study focuses on the health, health behaviours and their socioeconomic determinants among 11-, 13-, and 15-year-old children and has been conducted in 4-year intervals since 1983/84. Currently, 44 countries across Europe and North America are members of the HBSC network. More detailed information on the questionnaire used in the last HBSC survey in 2013/2014 can be found in the HBSC International Protocol (Currie et al., 2014), which can be obtained (upon registration) at the HBSC website: <http://www.hbsc.org/methods/>.

Schools were selected randomly after stratification by region and type of school (primary schools vs. secondary schools). Out of 244 contacted schools 243 schools agreed to participate (response rate 99.6%). Then, classes from the 5<sup>th</sup>, 7<sup>th</sup>, and 9<sup>th</sup> grades, in general corresponding to the age categories of 11-, 13-, and 15-year-olds, were selected at random, one from each grade per school.

Data from 14,539 pupils were obtained (response rate 89.2%). The majority of non-response was due to illness or other reasons, e.g. sports or academic competitions (10.6%), and 30 children refused to participate in the survey (0.2%). Because of some unlikely responses, an excess of missing values throughout the questionnaire, or missing information on age, gender or all the responses on OLTA items, 531 questionnaires were excluded. Lastly, according to the HBSC-protocol only adolescents aged 11, 13, and 15 were selected, leading to a final sample of 10,503 respondents.

### Procedure

The data were collected between April and June 2014. The questionnaires were distributed by trained administrators, while the teacher was not present in the classroom to reduce the response bias. Respondents had one school lesson (45 minutes) dedicated to completing the questionnaire. Participation in the survey was anonymous and voluntary. The data used in this study is not publicly available. Permission to use it was obtained from the Czech HBSC Principal Investigator.

The Czech HBSC study was conducted under auspices of Ministry of Education, Youth and Sports of the Czech Republic and the World Health Organization Country Office in the Czech Republic. The Czech legislation does not require written informed consent for participation in questionnaire surveys. The option to opt out of the study was emphasized to the respondents prior to administration of the questionnaires. The study design was approved by the Ethics Committee of the Faculty of Physical Culture, Palacky University in Olomouc.

### Measures

Life satisfaction as a dimension of mental health was measured by the item '*Here is a picture of a ladder. The top of the ladder '10' is the best possible life for you and the bottom '0' is the worst possible life for you. In general, where on the ladder do you feel you stand at the moment?*' (Cantril, 1965). The 11 response categories were dichotomized using a cut-off of 9 to capture the top quartile

Health complaints were assessed by 4 items (feeling low, irritability or bad temper, feeling nervous, sleeping difficulties) and preceded by the question '*In the last 6 months: how often have you had the following...?*' with 5 response categories ranging from *about every day* to *rarely or never*. All four questions were dichotomized using a generally accepted cut-off set to *at least once a week* (Brindova et al., 2015; Currie et al., 2012).

Physical health was assessed by the self-rated health measure '*Would you say your health is ...?*' (Idler & Benyamini, 1997) with 4 response categories *Excellent / Good / Fair / Poor*. Responses were dichotomized using a cut-off point *Excellent* in order to capture the top quartile.

OLTA participation was measured by 6 items dealing with individual types of organized leisure-time activities (team sports, individual sports, art school, youth organizations, recreation/leisure centres, church meeting/singing – including country-specific examples) (Bosakova et al., 2016). The dichotomous question '*In your free time, do you do any of these organized activities?*' with response categories *yes/no* was followed by the explanatory text: '*We mean activities you do in sports or other club or organization*'. Missing answers were considered to represent 'no' unless all six OLTA items were missing. Then the respondent was excluded ( $n=252$ ).

### Statistical analyses

First, we described the composition of the sample and its participation in specific activities and the breadth of the activities. Next, we reduced the amount of possible combinations of particular activity involvement patterns using cluster analysis. Searching for the smallest number of clusters, yet having a reasonable structure, i.e. a value of the average silhouette width exceeding 0.5 (Kaufman & Rousseeuw, 1990), we obtained five clusters, which were used in the subsequent analyses. We used chi-square tests to assess the statistical significance of gender and age differences in particular activities, number of concurrent activities, and clusters of OLTA and we used one-way ANOVA with a Tukey's HSD post hoc test to assess the statistical significance of differences in average number of activities with increasing age. Third, we analysed the associations of the binary overall OLTA variable (at least one activity vs. none) and of the clusters of OLTA with the selected health indicators, using logistic regression analyses. We assessed crude associations per health indicator (Model 1). Next, we adjusted for age and gender (Model 2). To assess the moderating effects of gender and age on the associations with health indicators the interactions between gender and OLTA, as well as between age and OLTA, were assessed in the Models 3 and 4. Finally, logistic regressions were run again. All the data were analysed using IBM SPSS 22 for Windows (IBM Corp. Released 2013).

## Results

The characteristics of the sample are presented in Table 4.1. A vast majority (roughly 4 of 5) of the adolescents was involved in at least one of the six types of organized activities and the average number of activities youth were involved in was 1.52 ( $SD = 1.17$ ). The rate of participation declined with increasing age, regardless of gender, both in terms of the average number (breadth) of activities ( $p < 0.001$ ) and their individual types. Accordingly, the number of inactive adolescents grew as they got older, especially in girls. Over 60% of adolescents participated in 1 or 2 activities and only about 6% were engaged in 4 or more activities concurrently. Team sports were the favourite organized activity in boys, while girls preferred artistic pursuits.

The cluster analysis yielded five groups having a reasonable structure. Members of the clusters '*inactive*' and '*team sports*' were inactive or only doing a team sport, respectively. Within the cluster '*individual sports*' approximately half of adolescents participated also in team sports and, similarly, approximately half of the members of the cluster '*artists*' engaged in an individual and/or a team sport in addition to the arts. The cluster '*all-rounders*' comprised all the remaining adolescents and 85% of its members participated in at least 2 activities.

Table 4.1 Description of the study population: frequencies of respondents participating in various separate organized leisure-time activities (top half) and clusters of activity patterns (bottom half) by gender and age

	Gender		Age						Total			
	Boy		11		13		15		Total			
	n	%	n	%	n	%	n	%	n	%		
Participation on each OLTA separately												
Team sports	3067	59.3	1960	36.8	1709	51.3	1773	50.1	1545	42.6	5027	47.9
Individual sports	1468	28.4	1710	32.1	1119	33.6	1088	30.7	971	26.7	3178	30.3
Art school	1012	19.6	2416	45.3	1350	40.5	1175	33.2	903	24.9	3428	32.6
Youth org.	733	14.2	640	12.0	547	16.4	495	14.0	331	9.1	1373	13.1
Recr./Leisure centre	975	18.9	1050	19.7	838	25.2	727	20.5	460	12.7	2025	19.3
Church	370	7.2	427	8.0	316	9.5	262	7.4	219	6.0	797	7.6
OLTA clusters												
Active*	4238	82.0	4292	80.5	2899	87.0	2960	83.6	2671	73.6	8530	81.2
All-rounders	1578	30.5	1696	31.8	1322	39.7	1143	32.3	809	22.3	3274	31.2
Artists	506	9.8	1447	27.1	700	21.0	677	19.1	576	15.9	1953	18.6
Individual sports	738	14.3	634	11.9	358	10.7	467	13.2	547	15.1	1372	13.1
Team sports	1416	27.4	515	9.7	519	15.6	673	19.0	739	20.4	1931	18.4
Inactive	932	18.0	1041	19.5	433	13.0	581	16.4	959	26.4	1973	18.8
Number of activities												
1 activity	2142	41.4	1818	34.1	1129	33.9	1365	38.5	1466	40.4	3960	37.7
2 activities	1245	24.1	1447	27.1	959	28.8	917	25.9	816	22.5	2692	25.6
3 activities	551	10.7	730	13.7	519	15.6	483	13.6	279	7.7	1281	12.2
4 activities	198	3.8	207	3.9	205	6.2	127	3.6	73	2.0	405	3.9
5 activities	64	1.2	67	1.3	67	2.0	44	1.2	20	0.6	131	1.2
6 activities	38	0.7	23	0.4	20	0.6	24	0.7	17	0.5	61	0.6

ns – not significant

% represents the percentage of respondents within the column concerned (gender, age, total) who participated in the given activity or belonged to the particular cluster.

\* the 'Active' category in the middle section of the Table represents all the adolescents participating in at least one organized leisure-time activity and is, thus, equal to a sum of the four clusters - All-rounders, Artists, Individual sports, and Team sports.

Table 4.2 shows odds ratios and 95% confidence intervals for the associations of the binary participation variables with the health indicators. Being involved in at least one activity was found to be significantly associated with higher life satisfaction, self-rated health, and the likelihood of feeling low less than once a week also after adjustment for age and gender (Model 2). The strongest association with participation in OLTA was found for self-rated health resulting in active adolescents being almost twice as likely to perceive their health as excellent. Moreover, they had 1.35 times higher odds of feeling very satisfied. Interactions of participation in OLTA with gender and age were tested next. None of these interactions was statistically significant (not shown).

Table 4.2 Association of binary participation variables with health indicators: odds ratios and 95% confidence intervals for active vs. inactive adolescents (reference category)

	High life satisfaction (Q1)	Infrequently feeling low ( <i>&lt; once a week</i> )	Infrequently irritated/bad tempered ( <i>&lt; once a week</i> )	Infrequently feeling nervous ( <i>&lt; once a week</i> )	Infrequent sleeping difficulties ( <i>&lt; once a week</i> )	Excellent self-rated health (excellent)
Model 1 (univariable)						
≥1 activity vs. inactive	1.51*** (1.35-1.70)	1.33*** (1.17-1.51)	1.12* (1.00-1.25)	1.12* (1.00-1.24)	1.03 (0.91-1.16)	1.94*** (1.70-2.21)
Model 2 (adjusted for age and gender)						
≥1 activity vs. inactive	1.35*** (1.20-1.52)	1.20** (1.06-1.37)	1.08 (0.96-1.20)	1.09 (0.97-1.21)	1.01 (0.90-1.14)	1.93*** (1.69-2.20)

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ ; Q1 – top quartile

Table 4.3 presents the results of the logistic regressions using the clusters of OLTA as independent variables. The inactive cluster was selected as the reference category for all subsequent analyses. Model 1 shows the crude odd ratios. Except for life satisfaction the interactions with age and/or gender were statistically significant for all other health indicators. Therefore, we do not present results of the age and gender adjusted logistic models regarding the clusters of OLTA without these interactions (Model 2). The members of all four active clusters were more likely to report excellent health compared with the inactive cluster, the strongest association being with the individual sports cluster. Adolescents from all active clusters were also more satisfied with their own lives than the inactive ones. The odds ratios ranged from 1.26 for artists to 1.61 for those in individual sports.

The interactions of gender with clusters of OLTA (Model 3) regarding its association with health indicators were statistically significant. We found gender differences for three types of health complaints and for self-rated health in team sports and for sleeping difficulties in individual sports. The membership in team sports cluster was found to be more strongly associated with better self-rated health in boys than in girls. Likewise, we observed a stronger association between participation in team and/or individual sports and less frequent health complaints in boys compared with girls. Reversely, girls attending art schools were less likely to face recurrent sleeping difficulties and feel low than boys attending art schools.

Model 4 assessed the interaction effects of age with cluster of OLTA. A stronger association between participation in art pursuits and a lower occurrence of health complaints (feeling low, irritability/bad temper, and feeling nervous) was found in 11-year-olds compared with 15-year-olds. Furthermore, the relationship between self-rated health and involvement in team sports was stronger for the oldest age category of adolescents than for those aged 13. None of the other interactions between age and clusters of activity patterns was statistically significant. As mentioned above, the interaction effects of age and gender were not statistically significant for life satisfaction; therefore the results for this indicator are not presented in Models 3 and 4.

Table 4.3 Associations with health indicators of participation in clusters of organized leisure-time activities compared to inactive: odds ratios and 95% confidence intervals for the various clusters vs. inactive adolescents

	High life satisfaction (Q1)	Infrequently feeling low (< once a week)	Infrequently irritated/bad tempered (< once a week)	Infrequently feeling nervous (< once a week)	Infrequent sleeping difficulties (< once a week)	Excellent self-rated health (excellent)
<b>Model 1 (univariable)</b>						
Inactive	1 (reference)	1 (reference)	1 (reference)	1 (reference)	1 (reference)	1 (reference)
All-rounders	1.50 (1.32-1.71)***	1.28 (1.10-1.48)**	1.10 (0.97-1.25)	1.08 (0.96-1.23)	0.96 (0.84-1.09)	1.70 (1.47-1.96)***
Artists	1.39 (1.21-1.61)***	1.05 (0.90-1.24)	1.03 (0.90-1.19)	1.03 (0.90-1.19)	0.94 (0.81-1.09)	1.74 (1.49-2.04)***
Individual sports	1.69 (1.45-1.97)***	1.29 (1.07-1.55)***	1.13 (0.97-1.33)	1.15 (0.99-1.34)	1.01 (0.85-1.19)	2.50 (2.11-2.95)***
Team sports	1.52 (1.32-1.75)***	1.95 (1.63-2.35)***	1.26 (1.09-1.46)**	1.24 (1.08-1.43)**	1.31 (1.12-1.54)**	2.21 (1.89-2.58)***
<b>Model 2 (adjusted for gender and age)</b>						
Inactive	1 (reference)					
All-rounders	1.27 (1.11-1.45)***					
Artists	1.26 (1.08-1.46)**					
Individual sports	1.61 (1.38-1.88)***					
Team sports	1.39 (1.20-1.62)***					
<b>Model 3 (adjusted for gender and age, including interaction with gender)</b>						
Inactive	1 (reference)	1 (reference)	1 (reference)	1 (reference)	1 (reference)	1 (reference)
All-rounders	1.19 (0.98-1.43)	1.19 (0.98-1.43)	1.03 (0.87-1.22)	1.08 (0.91-1.27)	0.96 (0.80-1.15)	1.53 (1.24-1.89)***
Artists	1.21 (1.00-1.48)	1.21 (1.00-1.48)	1.08 (0.90-1.29)	1.05 (0.88-1.24)	1.09 (0.90-1.31)	1.84 (1.49-2.28)***
Individual sports	1.13 (0.89-1.43)	1.13 (0.89-1.43)	0.98 (0.79-1.21)	0.98 (0.79-1.21)	0.81 (0.65-1.02)	2.14 (1.67-2.74)***
Team sports	1.16 (0.90-1.50)	1.16 (0.90-1.50)	0.85 (0.67-1.06)	0.87 (0.70-1.09)	1.05 (0.82-1.34)	1.40 (1.05-1.85)*
Gender M vs. F	2.25 (1.77-2.86)***	2.25 (1.77-2.86)***	1.41 (1.15-1.73)**	1.42 (1.17-1.73)***	1.47 (1.18-1.82)**	1.27 (1.00-1.62)
Artists M vs. F	0.66 (0.45-0.95)*	0.66 (0.45-0.95)*			0.72 (0.52-1.00)*	
Ind. sports M vs. F					1.51 (1.07-2.12)*	
Team sports M vs. F	1.64 (1.12-2.41)*	1.64 (1.12-2.41)*	1.54 (1.14-2.09)**	1.46 (1.09-1.95)*		1.66 (1.18-2.35)**
<b>Model 4 (adjusted for gender and age, including interaction with age)</b>						
Inactive	1 (reference)	1 (reference)	1 (reference)	1 (reference)	1 (reference)	1 (reference)
All-rounders	1.17 (0.92-1.49)	1.17 (0.92-1.49)	1.02 (0.83-1.26)	1.04 (0.84-1.28)	1.03 (0.82-1.28)	1.68 (1.32-2.15)***
Artists	0.92 (0.72-1.18)	0.92 (0.72-1.18)	0.91 (0.73-1.14)	0.99 (0.79-1.24)	0.91 (0.71-1.15)	1.74 (1.33-2.27)***
Individual sports	1.01 (0.77-1.31)	1.01 (0.77-1.31)	0.99 (0.78-1.26)	1.05 (0.83-1.33)	1.09 (0.84-1.41)	2.67 (2.07-3.44)***
Team sports	1.31 (1.00-1.70)*	1.31 (1.00-1.70)*	1.03 (0.82-1.28)	1.08 (0.87-1.34)	1.36 (1.06-1.74)*	2.30 (1.81-2.92)***
Age 11- vs. 15-yrs.	1.68 (1.21-2.32)**	1.68 (1.21-2.32)**	1.18 (0.91-1.54)	1.10 (0.85-1.42)	1.16 (0.87-1.53)	0.90 (0.65-1.25)
Age 13 vs. 15-yrs.	1.01 (0.78-1.30)	1.01 (0.78-1.30)	0.91 (0.73-1.15)	0.87 (0.69-1.09)	1.10 (0.86-1.42)	1.30 (0.99-1.71)
Artists 11- vs. 15-yrs.	1.59 (1.02-2.49)*	1.59 (1.02-2.49)*	1.50 (1.04-2.17)*	1.48 (1.04-2.12)*		
Team sports 13- vs. 15-yrs.						0.68 (0.48-0.98)*

\* p &lt; 0.05, \*\* p &lt; 0.01, \*\*\* p &lt; 0.001; only statistically significant odds ratios for interaction effects of gender and age are presented; M - males; F - females; yrs. - years old, Q1 - top quartile

## Discussion

Participation in OLTA was associated with enhanced physical and mental health among all adolescents independently of the type of OLTA. The associations between particular clusters of OLTA and less frequent occurrence of specific health complaints varied by gender and age.

As expected, we found that being engaged in one or more OLTA, regardless of their type, age or gender, was associated with higher life satisfaction and better self-rated health. This is in line with the evidence that states that in general any level of involvement is better than no involvement (Fredricks, 2012; Mahoney & Vest, 2012). However, the associations between particular clusters of OLTA and lower prevalence of health complaints were observed to differ by gender and age. This indicates that the actual type of activity matters, as previously pinpointed by Agans and Geldhof (2012).

Unlike other studies (Linver et al., 2009; Zarrett et al., 2009) we observed the strongest associations with healthy development indicators in adolescents engaged solely in sports and not in those having different patterns of activity involvement, i.e. 'all-rounders' and 'artists' clusters. This contradicts the broadly recognized premise that the more contexts children are involved in, the more developmental opportunities they have (Forneris et al., 2015; Hansen et al., 2003; Mahoney et al., 2006; Sharp et al., 2015). Physical activity may be a significant element underlying this finding as it offers undisputable benefits for physical and mental health (Biddle & Asare, 2011; Hallal et al., 2006; Janssen & LeBlanc, 2010). Those participating only in sports perhaps engage in physical activities more frequently and intensely than those who are involved in different types of OLTA, thus, enhancing their health-promoting effects. The link of other leisure pursuits and health in adolescents appears to be weaker, which accords with the results of Zambon et al. (2010).

Next, we found participation in individual and team sports to be associated with fewer health complaints only in boys. Physical activity has been documented to reduce symptoms of nervousness, irritability and sadness more in females than in males (Gaetz & Iverson, 2009). Therefore, we believe the weaker association between organized sports and health complaints in adolescent girls might be attributable mostly to motivational and social factors. First, compared with boys, European girls do not consider competition/achievement in physical activity to be as important (Iannotti et al., 2013; Kopcakova et al., 2015). This is actually in conflict with primary goal of sports (to win) as a performance- and success-centred setting. Second, boys consider conflict, which often arises in a competitive environment, to be a more natural part of their sport friendship than girls, who rather appreciate companionship, intimacy or pleasant play (Weiss & Smith, 2002). These discrepancies might lead to higher irritability or nervousness in girls, which could explain the relatively stronger association with a lower frequency of these health complaints in boys. Based on our results, it may be useful, especially in girls, to treat individual and team sports as separate contexts of healthy youth development, with each having specific advantages as has already been suggested by Hansen et al. (2010).

Regarding the interaction effect of age, the most prominent differences in the associations between participation in OLTA and the occurrence of health complaints were observed in the artist cluster. The associations with less frequently feeling low, nervousness and irritability were found in 11-year-old artists but not in those aged 15. In their systematic review, Bungay & Vella-Burrows (2013) reported that interventions using creative activities were supportive of well-being in youth without mentioning any age-specific data. Nevertheless, art performers have in general been shown to be more prone to irritability, anxiety (Lolich et al., 2015), neuroticism (Haller & Courvoisier, 2010) and mood disorders (Andreasen & Glick, 1988). Since we observed a noteworthy decline of participation in art activities with increasing age, it is possible that only the "genuine" artists, who are more apt to suffer from the above-mentioned symptoms, maintain their involvement. This could subsequently result in the diminishing of the associations for the oldest age category.

*Strengths and limitations*

The present study has several strengths. The most important are its sample size and the representativeness of the adolescent sample. Moreover, it uses the well-established HBSC methodology that is being developed by expert groups on a continuous basis. To the best of our knowledge it is also the first study in Europe using such a systematic classification of OLTA and dealing with age and gender differences in more detail.

Our findings also need to be interpreted in light of some limitations. First, we did not explore other dimensions of OLTA, such as frequency, duration, intensity and quality. These have been shown to affect the developmental outcomes (Bohnert et al., 2010); therefore the associations found in the present study might have been partly attributable to some of these characteristics. Second, the cross-sectional design does not allow us to draw any conclusions on causal relationships. It might be that being healthy and satisfied is a prerequisite for entering an organized activity and not its consequence (Trainor et al., 2010). Third, all the analyses were based on self-reported data, which is more susceptible to recall bias, though measures have in general been well-validated (Currie et al., 2014). Fourth, we found sports participation to be strongly associated with health but we could not adjust for physical activity. We could thus not determine to which degree this association was due to physical activity in itself, or due to the organisational aspect of sports participation.

*Implications*

In general, the results of our study support the contribution of OLTA to adolescents' health. However, the gender- and age-related differences in particular patterns of activities suggest that sports participation may reduce the prevalence of health complaints primarily in boys. On the other hand, girls and younger adolescents seem to benefit more from art activities.

Future research should concentrate on differences in relationship between particular types of OLTA and relevant developmental indicators. It should be also focused on unveiling the causal pathways between participation in organized-leisure time activities and health.

*Conclusions*

Organized activities done in leisure time are associated with better physical and mental health among adolescents, and this association is partly gender- and age-specific. While boys and older kids might benefit more from participating in team or individual sports, participation in art schools was associated with better health outcomes in girls and younger kids.





## Participation in organized leisure-time activities and risk behaviors in Czech adolescents

Petr Badura, Dagmar Sigmundova, Erik Sigmund, Andrea Madarasova Geckova, Jitse P. van Dijk, & Sijmen A. Reijneveld

*Published as: International Journal of Public Health, April 2017, Volume 62, Issue 3, pp 387-396*

### Abstract

*Objectives* The study aimed to assess the associations between participation in organized leisure-time activities (OLTA) and risk behaviors, and whether the associations differed by gender, age and pattern of OLTA involvement.

*Methods* Data from the 2013/2014 Health Behaviour in School-aged Children study on 10,279 11-, 13- and 15-year-old Czech adolescents (49.2% boys) were used. We assessed the associations between OLTA participation and risk behaviors, and modification by gender and age.

*Results* OLTA participants were less likely to smoke, get drunk repeatedly or skip school and, in contrast, more likely to get injured and fight repeatedly. The associations with lower occurrence of risk behaviors were the strongest for artists, while none was significant for adolescents participating only in team sports. Girls participating in OLTA had lower odds to smoke, get drunk or skip school than boys, and these boys had higher odds to get injured or fight.

*Conclusion* OLTA participation is associated with lower occurrence of repeated substance use and truancy and inversely with higher odds for physical fights and injuries. Girls, in general, are at lower risk when participating in OLTA than boys.

Keywords:

Adolescents, Extracurricular activities, Substance use, Violence, Bullying, Truancy

## Introduction

Historically, adolescence has been perceived as a turbulent period typified by an inclination towards problematic behaviors, with the fundamental goal of overcoming this time period with least harm possible inflicted on an individual (Hall, 1904). Lerner (2005) provided a detailed overview of the huge paradigm shift that has taken place since then. Today, young people are no longer considered only as 'problems to be managed' (Roth & Brooks-Gunn, 2003). Contemporary science has instead adopted the perspective of developmental assets – youth individual strengths that need to be fostered through contextual resources (Bowers et al., 2014; Roth & Brooks-Gunn, 2003). However, this approach does not omit the necessity of avoiding risk behaviors, and it has been hypothesized that such types of behaviors are negatively linked to healthy adolescent development (Lerner, 2005).

There is solid evidence on the detrimental effects on health and well-being of various forms of risk behaviors, ranging from smoking tobacco (WHO, 2012) and consuming alcohol (WHO, 2014) to injuries as a consequence of risk-taking (Pickett et al., 2006) or acts of violence (Walsh et al., 2013). These health-compromising behaviors are often established in adolescence and persist into adulthood (Cook et al., 2015).

However, involvement in these behaviors is to a certain extent understood as typical for young people and may even have some positive consequences for youth development, such as learning experiences, integration into a clique and stabilization of the social position acquired (Brady et al., 2008; Hurrelmann & Richter, 2006). We should thus distinguish experimenting from serious risk-taking (Moffitt, 1993). This was somewhat confirmed by Lewin-Bizan et al. (2010), who found that many adolescents labeled as developing healthily were also engaged in substance use or delinquency.

Although they account for only a small portion of time (Mahoney & Vest, 2012), organized leisure-time activities (OLTA) seem to protect against risk behaviors (Farb & Matjasko, 2012). OLTA participants are in general less likely to be involved in substance abuse, delinquency or bullying others (Farb & Matjasko, 2012; Riese et al., 2015). Time spent in OLTA might channel some stress-reduction efforts (Darling, 2005), and affiliation to a certain club might negate the need for stabilization of one's social position through risk behaviors (Viau et al., 2015).

Nonetheless, mere participation in OLTA obviously is not the only factor contributing to its association with a lower occurrence of risk behaviors. The type of OLTA seems to be important, too, with associations varying by type of OLTA. For instance, members of sport clubs, especially in regard to team sports, were observed to be more prone to drink alcohol (Linver et al., 2009) and act violently (Kreager, 2007). This supports the notion that different types of activities provide adolescents with different developmental experiences, such as distinct opportunities for identity-related exploration or reliance in teamwork. This is attributable to fundamental nature (e.g. normative systems, goals, tasks or performance conditions) of particular OLTA setting (Hansen et al., 2010). Also Takakura (2015) suggested that some types of OLTA (e.g. youth associations) could lead to a so-called dark side of social capital and consequently rather to adverse health-related outcomes, while from others the youth may benefit. Moreover, the associations between OLTA involvement and risk behaviors tend to differ by gender, as the majority of previous research reports boys benefiting more from such involvement (Fredricks & Eccles, 2006b; Metzger et al., 2011). Finally, OLTA have been shown to vary by socioeconomic status (Linver et al., 2009), and health-related behaviors as well (Currie et al., 2014).

Research on this topic has thus far been conducted mostly in the USA; therefore, we tried to verify if the associations would also be observed in a European context. The present study aimed to assess the associations of participation in OLTA with repeated substance use, violent behaviors, truancy and injuries among Czech adolescents aged 11, 13, and 15 years. Moreover, we examined whether the associations differ by gender, age and pattern of OLTA involvement.

## Methods

### *Sample and procedure*

We used data from the Health Behaviour in School-Aged Children (HBSC) study conducted between April and June 2014 in the Czech Republic. Schools were the primary sampling unit. They were selected randomly from the database of the Czech Ministry of Education, Youth and Sports, after being stratified by region and type of school (primary vs. secondary schools). Out of 244 contacted schools, 243 granted consent (response rate 99.6%) to carry out the survey. One class per 5<sup>th</sup>, 7<sup>th</sup>, and 9<sup>th</sup> grade, which in general correspond to the age categories of 11, 13, and 15 years old in the Czech Republic, was then selected at random at each of the participating schools. Questionnaires were administered during regular class time by trained research assistants in the absence of a teacher. Participation in the study was voluntary and anonymous, with no incentives offered to the participants. Parents or legal guardians of the adolescents were notified of the study and its purpose by the school management in advance and could withdraw their child if they disagreed. Prior to administration of the questionnaires, respondents were also given the opportunity to opt out of the study or skip questions that made them uncomfortable. The study design was approved by the Ethics Committee of the Faculty of Physical Culture, Palacky University, Olomouc (No. 17/2013).

We obtained data from 14,539 respondents (response rate 89.2%). Approximately ten percent of the children were not present at school during the survey. Thirty children refused to fill in the questionnaire (0.2%). First, in line with the HBSC protocol, we selected only adolescents aged 11, 13 and 15 years old ( $n=10,795$ ). Next, we excluded 516 cases due to missing data on all OLTA items ( $n=287$ ), more than half (i.e. 5 or more) of risk behaviors ( $n=4$ ), contradictory responses on reported prevalence of risk behaviors in lifetime versus the last 30 days ( $n=170$ ), or other unlikely responses throughout the questionnaire ( $n=55$ ). For instance, a respondent who indicated drinking alcohol (get drunk or smoke cigarettes) more than 3 times in the past month but never during his or her lifetime was excluded from the analyses. The final sample comprised 10,279 adolescents.

### *Measures*

Participation in OLTA was assessed using the question: *In your free time, do you do any of these organized activities?*, which was proven to have a good reliability (Bosakova et al., 2016). We investigated participation in the following six activities: *team sports, individual sports, art school, youth organizations, recreation/leisure centers or after-school clubs and church meeting/singing*. Missing answers were considered to represent a 'no' unless all six OLTA items were missing. Then the respondent was excluded ( $n=287$ ). First, the OLTA participation was investigated using a dichotomous variable (participation in *at least one OLTA* vs. in *no OLTA*). Next, the respondents were split into five groups of OLTA participation patterns (Table 5.1) based on a cluster analysis (Badura et al., 2015).

Table 5.1 Description of the respondents' patterns (clusters) of the organized leisure-time activity participation; 2013/2014 Health Behaviour in School-aged Children study in the Czech Republic

		Patterns of OLTA derived by the cluster analysis				
		All-rounders (n=3,183)	Artists (n=1,921)	Ind. sports (n=1,344)	Team sports (n=1,896)	Inactive (n=1,935)
<i>Gender</i>	Boys	1,539 (48.4%)	495 (25.8%)	720 (53.6%)	1,389 (73.3%)	913 (47.2%)
	Girls	1,644 (51.6%)	1,426 (74.2%)	624 (46.4%)	507 (26.7%)	1,022 (52.8%)
<i>Age</i>	11-year-olds	1,280 (40.2%)	689 (35.9%)	347 (25.8%)	507 (26.7%)	419 (21.7%)
	13-year-olds	1,108 (34.8%)	664 (34.6%)	462 (34.4%)	657 (34.7%)	569 (29.4%)
	15-year-olds	795 (25.0%)	568 (29.6%)	535 (39.8%)	732 (38.6%)	947 (48.9%)
<i>FAS</i>	Low	849 (27.1%)	514 (27.1%)	334 (25.2%)	496 (26.5%)	533 (27.9%)
	Medium	1,002 (32.0%)	578 (30.4%)	469 (35.3%)	627 (33.5%)	582 (30.5%)
	High	1,285 (41.0%)	811 (42.6%)	525 (39.5%)	747 (39.9%)	769 (41.7%)
<i>Types of activities</i>						
	Team sports	1,584 (49.8%)	748 (38.9%)	685 (51.0%)	1,896 (100%)	0
	Individual sports	1,134 (35.6%)	618 (32.2%)	1,344 (100%)	0	0
	Arts	1,434 (45.1%)	1,921 (100%)	0	0	0
	Youth organizations	1,342 (42.2%)	0	0	0	0
	Leisure centers*	1,962 (61.6%)	0	0	0	0
	Church meetings	781 (24.5%)	0	0	0	0
<i>Number of activities done concurrently</i>						
	1 activity	493 (15.5%)	836 (43.5%)	659 (49.0%)	1,896 (100%)	0
	2 activities	1,153 (36.2%)	804 (41.9%)	685 (51.0%)	0	0
	3 activities	957 (30.1%)	281 (14.6%)	0	0	0
	4 or more activities	580 (18.2%)	0	0	0	0

% represents percentage in particular OLTA cluster; FAS – Family Affluence Scale; OLTA - organized leisure-time activities; there were no missing values for OLTA in the final dataset.

\* this type of OLTA includes recreation or leisure centers and after-school clubs.

As indicators of risk behaviors, we selected eight distinct phenomena with the following cut-off points: *current smoking* (at least once a week), *alcohol consumption* (at least 3 days in the last 30 days), *drunkenness* (at least twice in the last 30 days), *injuries* (at least twice in the past 12 months), *physical fighting* (at least twice in the past 12 months), *truancy* (at least once in the past 12 months), and *bullying others – perpetration and being bullied – victimization* (at least twice a month). Using the last two items, as Solberg et al. (Solberg et al., 2007) recommended to distinguish between bullies and bully-victims (i.e. those being both bully perpetrators and victims), we derived a categorical variable of youth involved in bullying others (*bully and bully-victim vs. those not involved in bullying others*). Cut-off points regarding substance use and fighting were set in order to capture only more severe (recurrent, i.e. more than once) forms and to avoid undesired inclusion of their occasional occurrence. Items were part of the HBSC mandatory questionnaire, except for truancy. This was assessed as 'During the past 12 months, did you skip school without a proper excuse for at least a whole day?' The detailed description and scientific rationale of the other items can be found in the HBSC International Protocol (Currie et al., 2014).

Socioeconomic status of adolescents' families, as a confounder, was measured by the Family Affluence Scale (FAS) developed for the purposes of the HBSC study (Currie et al., 2014). The responses on six items exploring various indicators of family socioeconomic status (car ownership, holidays abroad, having one's own bedroom, number of computers in the household, number of bathrooms and dishwasher ownership) were summed up and transformed to a fractional rank score ranging from 0 to 1. The score was then trichotomized to classify respondents into groups of low (0-0.333), medium, (0.334-0.666) and high (0.667-1) socioeconomic status.

### Statistical analyses

First, we described the composition of the sample and its involvement in various risk behaviors. Second, using binary logistic regressions, we assessed the associations of the dichotomized overall OLTA variable (at least one activity vs. none) with cigarette smoking, alcohol use, drunkenness, involvement in physical fights, truancy, and injuries. The association of OLTA participation with bullying perpetration was analyzed using multinomial logistic regression. In the first step, we assessed crude

associations per risk behavior and bullying categories, respectively (Model 1). Next, we adjusted for age and gender (Model 2), and then also for FAS (Model 3). Last, we tested interaction effects of gender (Model 4) and age (Model 5) on these associations. Then, using a Two Step cluster analysis, we derived five distinct clusters of adolescents based on their pattern of OLTA participation. This number of clusters was the smallest possible that led to a reasonably high homogeneity within the clusters and reasonably high differences between particular clusters, shown by an average silhouette width over the value of 0.5 (Badura et al., 2015). All the regression analyses were then run again for each separate cluster of OLTA as an independent variable. The data were analyzed using ordinary single-level regression, because multilevel analyses yielded no indication of clustering by school. Prior to conducting the regression analyses, we assessed the random variance of specific risk behaviors at the level of schools and for none of them it was statistically significant. The statistical analyses were carried out using IBM SPSS 22 for Windows (IBM Corp. Released 2013) and MLwiN Version 2.02 (Centre for Multilevel Modelling, University of Bristol).

## Results

As is apparent from Table 5.2, relatively few adolescents engaged in recurrent substance use and were involved bullying – either as a bully or bully-victim. The overall prevalence was the highest for fighting, with nearly one in four getting into a fight at least twice in the last year.

Table 5.2 Description of the study population: rate of respondents' involvement in risk behaviors and number of missing values per variable; 2013/2014 Health Behaviour in School-aged Children study in the Czech Republic

		n	%	missing values
Gender	Boys	5,056	49.2	0
	Girls	5,223	50.8	
Age	11-year-olds	3,242	31.5	0
	13-year-olds	3,460	33.7	
	15-year-olds	3,577	34.8	
FAS	Low	2,726	26.9	131
	Medium	3,258	32.1	
	High	4,164	41.0	
Risk behaviors				
Smoking	≥1×/weekly	681	6.6	57
Alcohol	≥3×/last 30 days	926	9.0	241
Drunkenness	≥2×/last 30 days	257	2.5	245
Injuries	≥2×/last year	1,764	17.2	23
Fighting	≥2×/last year	2,273	22.1	46
Truancy	≥1×/last year	1,507	14.7	42
Bully	≥2×/monthly	225	2.2	151
Bully-victim	≥2×/monthly	90	0.9	151

% - valid percent in the total sample (n=10,279); FAS – Family Affluence Scale

Table 5.3 presents the odds ratios (OR) and 95% confidence intervals (CI) for the associations of the dichotomized OLTA participation variables with the risk behaviors. Adolescents participating in at least one OLTA were less likely to smoke, get drunk or skip school than their inactive peers, both crude (Model 1) and also after adjustment for differences in gender and age (Model 2), as well as FAS (Model 3). On the other hand, we observed higher odds for fighting and getting injured among those involved in OLTA. No association was found with either of the bullying categories (not shown).

The interaction effects with gender on the association of participation in OLTA with risk behaviors were tested next. Apart from drunkenness, all of them were significant. The associations between OLTA participation and less frequent smoking, alcohol consumption and truancy were stronger in girls (Model 4, see also Figure 5.1), showing that girls participating in at least one OLTA are less likely to be engaged in a risk behavior, whereas this participation does not make a difference in boys. On the other hand, boys participating in at least one OLTA are more likely to get injured or

involved in physical fights than girls participating in OLTA compared with their nonparticipating counterparts. No OLTA-gender interactions were found concerning the bullying categories. We did not observe any interactions with age either (Model 5 not shown). The only exception was that 13-year-old OLTA participants were significantly less likely to be bully than those aged 15 (OR=0.35, 95% CI=0.17-0.73).

Table 5.3 Association of dichotomized participation variables with risk behaviors: odds ratios (OR) and 95% confidence intervals (CI) for active vs. inactive adolescents (reference category, with OR=1), 2013/2014 Health Behaviour in School-aged Children study in the Czech Republic

	Model 1 (univariable)		Model 2 (adjusted for gender and age)		Model 3 (adjusted for gender, age and FAS)		Model 4 (interaction of OLTA participation with gender, adjusted for age and FAS)						
	OR	95% CI	OR	95% CI	OR	95% CI	main effect of (≥1 activity vs. inactive)	main effect of gender (B vs. G)	interaction of OLTA and gender (OLTA participants B vs. G)	OR	95% CI	P-value	
Smoking (≥1×/weekly)	0.51	0.43-0.60	0.70	0.59-0.84	0.70	0.59-0.84	0.54	0.43-0.68	0.52	0.38-0.71	1.91	1.32-2.76	<.001
Alcohol (≥3×/last 30 days)	0.73	0.62-0.86	0.94	0.80-1.11	0.94	0.80-1.11	0.77	0.61-0.97	1.14	0.86-1.53	1.48	1.06-2.07	.021
Drunkenness (≥2×/last 30 days)	0.50	0.38-0.65	0.68	0.51-0.89	0.68	0.52-0.89							
Injuries (≥2×/last year)	1.78	1.53-2.07	1.87	1.60-2.18	1.87	1.60-2.18	1.54	1.25-1.89	0.80	0.60-1.06	1.51	1.11-2.06	.009
Fighting (≥2×/last year)	1.27	1.12-1.45	1.17	1.03-1.34	1.18	1.03-1.34	0.95	0.76-1.19	3.27	2.55-4.20	1.37	1.04-1.81	.026
Truancy (≥1×/last year)	0.85	0.75-0.98	0.84	0.73-0.96	0.84	0.73-0.96	0.72	0.60-0.87	0.85	0.67-1.09	1.37	1.04-1.79	.028

B - boys; G - girls; OR - odds ratio; CI - confidence interval; OLTA - organized leisure-time activities; FAS - Family Affluence Scale

P-values based on logistic regression analyses

ORs and 95% CIs for Model 4 are presented only when the interaction effect of gender with OLTA participation was statistically significant.



Figure 5.1 Percentages of adolescents active in organized leisure-time activities and those inactive who reported being involved in specific risk behaviours by gender (total sample, n=10,279); 2013/2014 Health Behaviour in School-aged Children study in the Czech Republic

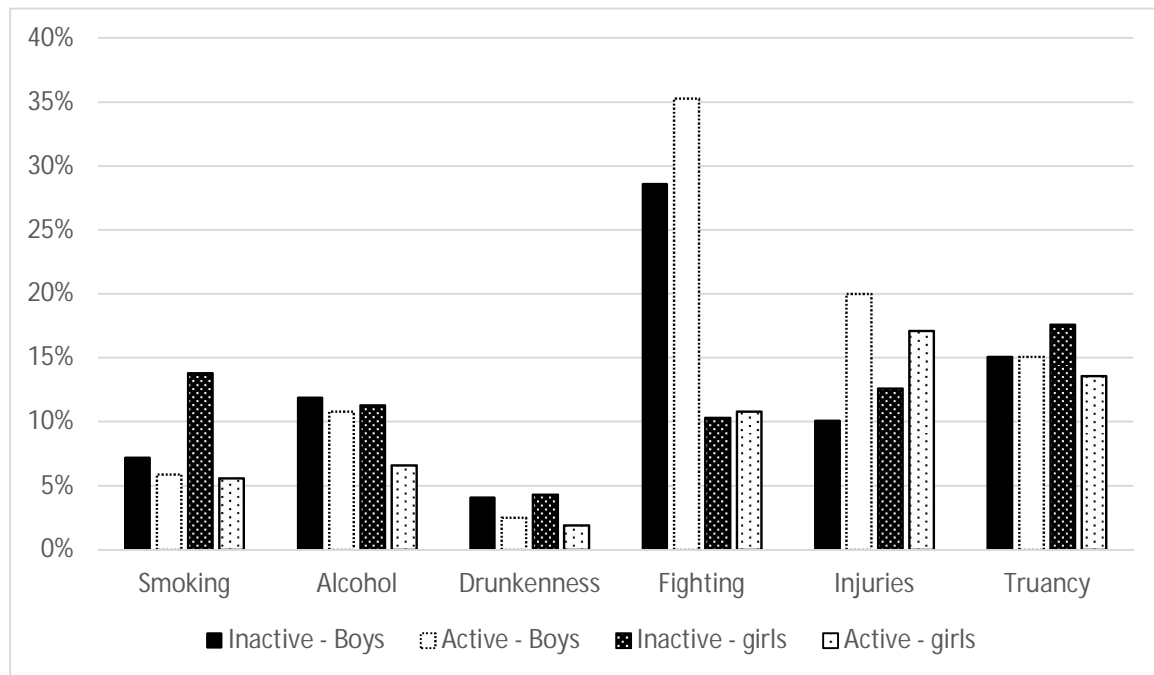


Table 5.4 presents the results of the logistic regressions using clusters of OLTA as independent variables, with the inactive cluster as the reference category. After adjustment for age, gender and FAS (Model 3), the all-rounders, artists and individual sports clusters, but not team sports, had lower odds for regular smoking and repeated drunkenness in the last 30 days. No association was observed between OLTA clusters and recent alcohol consumption, except in the crude model. In all clusters active adolescents were significantly more likely to get injured. The all-rounders and team sports cluster members had also higher odds of getting involved in physical fights more than once in the last year. Regarding bullying, we found no significant association with being a bully (perpetrator) after adjusting for gender, age and FAS (Model 3). However, artists had significantly lower odds of being a bully-victim.

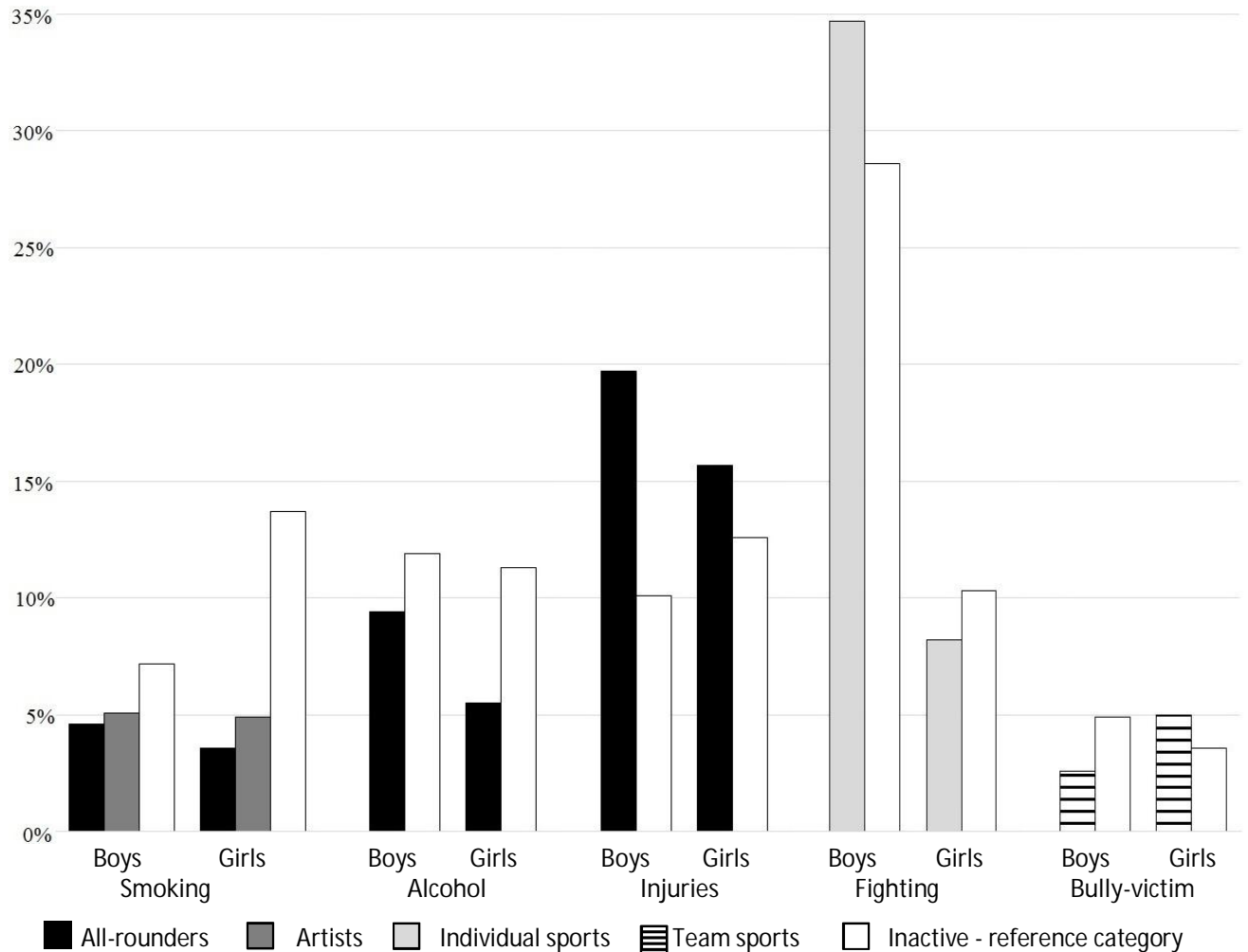
Only a few of the interactions of gender with the associations between OLTA clusters and risk behaviors were statistically significant. Membership of the all-rounder (OR=2.55, 95% CI=1.58-4.13) and artists (OR=2.00, 95% CI=1.12-3.57) clusters was associated with significantly higher odds for smoking in boys than in girls. Although the interaction effects with gender regarding the remaining risk behaviors were not statistically significant in terms of the overall variable p-value for all OLTA categories combined, we did observe interactions of gender after splitting the OLTA participants into separate clusters. Compared with the inactive cluster, boys in the all-rounders cluster had higher odds of drinking alcohol than all-rounder girls (OR=1.65, 95% CI=1.10-2.48) and, likewise, of fighting when in the individual sports cluster (OR=1.92, 95% CI=1.26-2.92). Affiliation to the all-rounder cluster was furthermore associated with higher risk of injuries, especially in boys (OR=1.67, 95% CI=1.19-2.35). Selected gender-stratified percentages of adolescents involved in risk behaviors per OLTA cluster are shown in Figure 5.2. The interactions of OLTA clusters with age categories were not statistically significant (Model 5, not shown).

Table 5.4 Association of participation in organized leisure-time activities (clusters of activity pattern) with risk behaviors: odds ratios and 95% confidence intervals for active vs. inactive adolescents (inactive cluster is the reference category): 2013/2014 Health Behaviour in School-aged Children study in the Czech Republic

	Smoking ≥1×/weekly	Alcohol ≥3×/last 30 days	Drunkenness ≥2×/last 30 days	Injuries ≥2×/last year	Fighting ≥2×/last year	Truancy ≥1×/last year	Bully ≥2×/monthly	Bully-victim ≥2×/monthly
<b>Model 1 (univariable)</b>								
Inactive	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
All-rounders	0.36*** (0.28-0.45)	0.62*** (0.51-0.75)	0.40*** (0.28-0.57)	1.69*** (1.43-2.00)	1.43*** (1.24-1.65)	0.89 (0.76-1.04)	0.90 (0.61-1.31)	1.03 (0.60-1.75)
Artists	0.43*** (0.33-0.55)	0.61*** (0.49-0.76)	0.33*** (0.21-0.51)	1.52*** (1.26-1.83)	0.75*** (0.64-0.90)	0.67*** (0.56-0.81)	0.62* (0.38-0.99)	0.22** (0.09-0.59)
Individual sports	0.60*** (0.46-0.77)	0.83 (0.66-1.04)	0.42*** (0.27-0.67)	2.00*** (1.64-2.42)	1.21* (1.02-1.45)	0.88 (0.73-1.07)	1.15 (0.74-1.80)	0.46 (0.20-1.08)
Team sports	0.78* (0.63-0.97)	1.00 (0.82-1.22)	0.91 (0.66-1.26)	2.04*** (1.71-2.45)	1.67*** (1.43-1.95)	0.97 (0.81-1.15)	1.14 (0.76-1.71)	0.88 (0.48-1.64)
<b>Model 2 (adjusted for gender and age)</b>								
Inactive	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
All-rounders	0.58*** (0.45-0.73)	0.90 (0.74-1.11)	0.64* (0.45-0.92)	1.82*** (1.53-2.16)	1.32*** (1.14-1.53)	0.87 (0.74-1.01)	1.03 (0.70-1.52)	0.91 (0.53-1.56)
Artists	0.58*** (0.44-0.75)	0.89 (0.71-1.12)	0.47*** (0.30-0.74)	1.63*** (1.35-1.98)	0.96 (0.80-1.15)	0.66*** (0.55-0.80)	0.80 (0.49-1.29)	0.23** (0.09-0.61)
Individual sports	0.70** (0.53-0.91)	0.91 (0.72-1.15)	0.48** (0.30-0.77)	2.03*** (1.67-2.47)	1.10 (0.91-1.31)	0.88 (0.72-1.07)	1.15 (0.74-1.80)	0.43 (0.18-1.01)
Team sports	1.00 (0.80-1.26)	1.05 (0.85-1.29)	1.06 (0.76-1.49)	2.05*** (1.71-2.46)	1.19* (1.01-1.40)	0.96 (0.80-1.14)	1.01 (0.68-1.55)	0.75 (0.40-1.40)
<b>Model 3 (adjusted for gender, age and FAS)</b>								
Inactive	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)	1 (ref)
All-rounders	0.58*** (0.46-0.73)	0.91 (0.74-1.11)	0.64* (0.45-0.91)	1.82*** (1.53-2.16)	1.32*** (1.14-1.54)	0.87 (0.74-1.02)	1.05 (0.71-1.56)	0.91 (0.53-1.57)
Artists	0.58*** (0.44-0.75)	0.89 (0.70-1.12)	0.47*** (0.30-0.74)	1.63*** (1.35-1.97)	0.96 (0.80-1.15)	0.66*** (0.55-0.80)	0.81 (0.50-1.31)	0.23** (0.09-0.61)
Individual sports	0.70** (0.54-0.92)	0.91 (0.72-1.16)	0.48** (0.30-0.77)	2.03*** (1.67-2.47)	1.09 (0.91-1.31)	0.88 (0.73-1.07)	1.15 (0.73-1.81)	0.43 (0.18-1.02)
Team sports	1.01 (0.80-1.27)	1.05 (0.85-1.30)	1.07 (0.76-1.50)	2.05*** (1.71-2.46)	1.19* (1.01-1.40)	0.96 (0.80-1.14)	1.05 (0.69-1.59)	0.75 (0.40-1.41)

\* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001 – P-values based on the logistic and multinomial regression analyses; FAS – Family Affluence Scale

Figure 5.2 Percentages of adolescents per organized leisure-time activity cluster who reported being involved in specific risk behaviors, in cases where the interactions of the cluster with gender were statistically significant (total sample, n=10,279); 2013/2014 Health Behaviour in School-aged Children study in the Czech Republic.



## Discussion

Participation in OLTA was associated with lower odds for regular smoking, recurrent drunkenness and truancy. In contrast, OLTA participants were more likely to get injured and to fight repeatedly. Associations for reduced alcohol consumption were less consistent and non-significant after adjustment for age, gender and FAS. However, the associations slightly varied by specific OLTA clusters, with artists (involved only in art activities or combining arts and sports) being the least prone to individual risk behaviors and at less risk of getting injured. In contrast, membership to the team sports cluster (those involved only in team sports) was not significantly associated with reduced risk occurrence. These findings in general are in accord with the previous research conducted mostly in the USA. However, we found a relatively consistent effect of gender on the associations between OLTA and risk behaviors. Unlike previous US studies (Fredricks and Eccles 2006; Metzger et al. 2011), we rather observed girls profiting from OLTA participation in terms of being exposed to a lower chance of getting involved in one of the examined risk behaviors.

We found that adolescents involved in OLTA were in general less likely to be engaged in risk behaviors than their uninvolved peers. This finding is in agreement with previous studies linking OLTA to less health-compromising behaviors (Bohnert & Garber, 2007; Farb & Matjasko, 2012). This could be explained by the fact that adolescents tend to engage in risk behaviors less often because they spend a considerable amount of time under influential adult supervision (Bohnert & Garber, 2007). Moreover, the positive identity-related experiences and goal-directed behaviors as a consequence of OLTA participation are thought to protect against risk behaviors (Palen & Coatsworth, 2007). It seems

that the structured content of OLTA and guidance of adult leaders make adolescents less prone to get involved in risk behaviors.

We also observed lower odds for truancy in adolescents participating in OLTA, which complements the finding that youth with mostly unstructured leisure time reach the highest levels of truancy (Nelson & Gastic, 2009). There is evidence of higher attachment to school and better general school performance among OLTA participants (Fredricks, 2012). They are also able to maintain healthier relationships both with their peers and non-familial adults (Crean, 2012; Schaefer et al., 2011). As a consequence, they perhaps try to avoid school duties less often (Palen & Coatsworth, 2007) and feel better in the social context of school, which could in turn lead to the lower rate of active adolescents skipping school.

On the other hand, the odds of getting injured and being involved in physical fights were higher in those participating in OLTA, particularly in boys. All the active clusters contained adolescents participating in sports, and this finding would fit quite well the picture of sports as an environment in which various conflicts frequently arise (Martin et al., 2014). Although in sports adolescents also learn to cope with conflicts, they are still focused on efforts of physical domination over the opponent and present opportunities to 'compare muscles'. This, in combination with eventual conflicts, might partly underlie our finding on higher odds of fighting when involved in OLTA. The higher rate of injuries seems to be logical as well, as sports markedly increase the risk of medically attended injuries (Maffulli et al., 2011).

Our consistent finding that girls are less engaged in risk behaviors when participating in OLTA is, to the best of our knowledge, unprecedented. Previous research found OLTA participation associated either with reduced risk behaviors in boys (Fredricks & Eccles, 2006b; Metzger et al., 2011) or, oppositely, increased risk in girls (Linville & Huebner, 2005). It has been shown that girls in adolescence believe more in the legitimacy of an adult authority (Kuhn & Laird, 2011). This may decrease their involvement in risk behaviors when supervised by an adult, such as a coach or leader.

As in a recent study (Takakura, 2015), we observed differences by OLTA participation patterns. The artist cluster yielded the strongest associations with less substance use and none with fighting. The team sports cluster members, in contrast, showed no significant association with reduced risk behaviors and were only more likely to get injured or fight. Some young athletes, especially those involved in team sports, were indeed shown to be more prone to aggressive conduct (Kreager, 2007) or higher rates of alcohol consumption (Farb & Matjasko, 2012). In contrast, Denault et al. (Denault et al., 2009) observed the intensity of participation in art activities to be predictive of lower alcohol consumption, and Sharp et al. (2015) found that children taking part in multiple activities reported significantly lower levels of substance use. This is in line with our findings and only underpins the assumption that the actual type (pattern in our case) of activity matters (Badura et al., 2015).

### *Strengths and limitations*

The large and representative sample is the most important strength of this study. Furthermore, it was based on the well-established and recognized HBSC study, with a strong methodological background regarding data collection procedures and construction of the questionnaire, which is being developed by an international expert team on a continuous basis.

The present study also has some limitations. First, due to its cross-sectional design it is impossible to determine causality of the associations. Second, the use of self-reported data is in general more susceptible to being biased. However, the HBSC mandatory items on substance use, injuries and violent behaviors have been shown to have validity and reliability (Currie et al., 2014). Third, we lacked more detailed information on specific types of OLTA, as it has been proven that, e.g. there is a difference between American football and baseball in aggressive behaviors (Kreager, 2007), while our measures did not allow capturing such differences. Last, we also did not have data on other dimensions of OLTA, such as intensity, duration and engagement, which might play unique roles and could have affected the associations found.

### *Implications*

Generally, the findings of the present study demonstrate the associations between OLTA participation and lower occurrence of regular substance use and truancy. This indicates that conclusions drawn previously in the US context might be applicable to the European context as well. The structured content of OLTA could, therefore, serve as one of the options to address these issues, especially in

girls, who seem to profit more from their participation in terms of lower occurrence of risk behaviors. In particular, art activities, either alone or in combination with sports, appear to be the most beneficial OLTA context. Future research should concentrate on revealing the causal pathways between OLTA participation and risk behaviors.

### Conclusions

OLTA participants are less likely to smoke regularly, get drunk repeatedly and skip school. On the other hand, OLTA involvement is associated with higher risk of physical fighting and injuries. Girls in general seem to be at lower risk of risk behaviors when participating in OLTA than boys. However, the specific OLTA pattern is important, because we found no significant association with reduced occurrence of risk behaviors among adolescents involved only in team sports.

## Is participation in organized leisure-time activities associated with school performance in adolescence?

Petr Badura, Erik Sigmund, Andrea Madarasova Geckova, Dagmar Sigmundova, Jan Sirucek, Jitse P. van Dijk, & Sijmen A. Reijneveld

*Published as: PLoS One, April 2017, Volume 11, Issue 4, e0153276*

### Abstract

*Background:* Organized leisure-time activities (OLTA) have been identified as a context suitable for improvement of school performance. This study aimed to assess the associations between participation in OLTA and school engagement, school-related stress, academic achievement and whether these associations differ by specific pattern of OLTA participation, gender and age. Furthermore, it assessed whether OLTA participants are more likely to acquire support for schoolwork from outside the family.

*Methods:* The sample concerned 10,483 adolescents (49.2% boys) aged 11, 13 and 15 from the Health Behaviour in School-aged Children data collection in 2014 in the Czech Republic. Logistic regressions adjusted for gender and age were used to analyse the associations between participation in OLTA and four education-related outcomes.

*Results:* Participation in OLTA was associated with higher school engagement, lower levels of school-related stress and better academic achievement regardless of gender and age. The strongest associations were observed for adolescents involved in various types of OLTA concurrently, with odds ratios ranging from 1.34 (95% confidence interval (CI) 1.17-1.54) for lower school-related stress to 1.97 (95% CI 1.73-2.25) for above-average academic achievement. OLTA participants were also more likely to have a non-familial person to help them with schoolwork, though this association was weaker in 15-year-olds.

*Conclusion:* Youth involvement in OLTA is linked to general better school performance and attachment to school. Adolescents participating in more activities at the same time have the best school performance.

### Keywords:

Adolescents, Extracurricular activities, School, Academic achievement, Social support, Stress

## Introduction

School is an essential developmental context during adolescence (Eccles & Roeser, 2011) and closely relates to health of young people. On the one hand, better school performance and higher school attachment are predictive not only of school completion (Appleton et al., 2008) and future socioeconomic success (Strenze, 2007), but there is also a link to enhanced health and well-being in adolescents (Newland et al., 2015; Ravens-Sieberer et al., 2004; Suhrcke & de Paz Nieves, 2011). Greater levels of school-related stress, on the other hand, are detrimental to health (Ottova et al., 2012).

Organized leisure-time activities (OLTA) have been proposed as a potential “booster” of education-related outcomes (Eccles et al., 2003; Mahoney & Cairns, 1997). Numerous studies have confirmed that participation in OLTA is associated with improved academic achievement (Fredricks, 2012; Guevremont et al., 2014; Himelfarb et al., 2014) or higher school engagement (Dotterer et al., 2007; Eccles et al., 2003; Knifsend & Graham, 2012) and have documented the stress-buffering effects of OLTA (Darling, 2005). It is assumed that OLTA fosters initiative (Larson, 2000), non-cognitive skills (Covay & Carbonaro, 2010), learning goal orientation (Fischer & Theis, 2014) and the formation of supportive social networks (Eccles & Roeser, 2011). This can in turn lead to better achievement and attachment to school. Moreover, those who participate in OLTA can form and maintain stronger relationships both with their peers and adults outside their family (Crean, 2012; Schaefer et al., 2011). These can then assist them in overcoming a potential lack of ‘educational resources’ within their own family.

As distinct OLTA are unique in their contents and the developmental assets they offer to youth, they may also yield different education-related effects (Covay & Carbonaro, 2010; Guevremont et al., 2014; Metzger et al., 2009). For instance, Himelfarb et al. (2014) have observed improved school performance in adolescents attending art activities, clubs or sports, while membership to religious groups was unrelated to grades. In addition to the activity type itself, it has also been suggested that involvement of adolescents in more contexts (i.e. various activities at the same time) is better for their development (Dworkin et al., 2003; Fredricks & Eccles, 2006b; Mahoney & Cairns, 1997; Sharp et al., 2015). However, a certain saturation effect may occur, i.e. a plateau or even a slight decline in positive education-related outcomes when the number of activities is too high (Fredricks, 2012; Fredricks & Eccles, 2010; Knifsend & Graham, 2012).

Hitherto, research on this topic has been conducted only scarcely in Europe and has mostly originated from the USA. Considering the differences of educational and OLTA systems across cultures it is desirable to focus on this issue in the European context as well. The present study, therefore, aims to assess whether participation in OLTA is associated with improved school performance in Czech adolescents and whether the associations differ by specific pattern of OLTA participation, gender and age. Furthermore, it aims to explore whether OLTA participants are more likely to acquire support for schoolwork outside the family.

## Methods

### *Participants*

Data analysed in the present study were drawn from the 2013/2014 Health Behaviour in School-Aged Children (HBSC) study in the Czech Republic. The HBSC study is a large-scale cross-national study carried out in four-year intervals in 43 countries in Europe and North America. It investigates health behaviours and their determinants and consequences in 11-, 13-, and 15-year-olds (Currie et al., 2009).

Schools were the primary sampling unit and were selected randomly, after stratification by region and type of school (primary vs. secondary schools), from the database of the Czech Ministry of Education, Youth and Sports. We received consent to carry out the survey in 243 out of 244 contacted schools (response rate 99.6 %). Then, one class from each of the 5<sup>th</sup>, 7<sup>th</sup>, and 9<sup>th</sup> grades, which in general correspond to the age categories of 11, 13, and 15 years in the Czech education system, was selected at random per school.

Out of 16,298 pupils registered in the classes selected for the survey, we obtained questionnaires from 14,539 respondents (response rate 89.2%); 1,729 pupils were not present in school during the survey (10.6%), with the most common cause of absence being an illness and sports

or academic competitions. Thirty pupils refused to fill in the questionnaire (0.2%). Next, in line with the HBSC protocol, we selected only 11-, 13- and 15-year-old adolescents from this sample ( $n=10,795$ ). Finally, we excluded 312 cases due to missing data on age, gender, all OLTA or education-related items, an excessive number of missing values on all items, or several unlikely responses throughout the questionnaire. The final sample concerned 10,483 respondents.

### *Procedure*

The survey was conducted between April and June 2014. The questionnaires were distributed by trained administrators. Teachers were not present in the classrooms in order to minimize the response bias. One school lesson (45 minutes) was dedicated to completing the questionnaire. The Czech HBSC study was conducted under auspices of Ministry of Education, Youth and Sports of the Czech Republic and the World Health Organization Country Office in the Czech Republic. The Czech legislation does not require written informed consent for participation in questionnaire surveys. The consent to carry out the study was obtained through school management at all the schools involved in the survey. Participation in the survey was anonymous and voluntary. Parents of the pupils were informed about the survey, its content and purpose via the school management in advance and could withdraw their child if they wished. Moreover, schools in the Czech Republic usually collect a so-called "general consent" from the pupils' parents/legal guardians at the beginning of each school year. This covers consent to take photographs or audio/video footage of pupils, provision of school counsellor's or psychologist's services, and participation in anonymous questionnaire surveys. The final decision is therefore, in principle, taken by the school administration (the school principal or employees on behalf of him/her). Prior to administration of the questionnaires the respondents were notified of the option to opt out of the study. The study design was approved by the Ethics Committee of the Faculty of Physical Culture, Palacky University in Olomouc (No. 17/2013).

There were five versions of the questionnaire – one for 11-year-olds, two for 13-year-olds, and two for 15-year-olds. The versions for 13-year-olds contained more questions than the one for 11-year-olds, and the versions for 15-year-olds still more. Versions for all ages comprised an identical set of mandatory questions, but they differed regarding the optional items, with two different versions for the two oldest age categories. The two distinct versions of questionnaires for both the older age categories were used with the intent to include as many areas of interest as possible while bearing in mind the age-appropriate length of the questionnaire. The item on school support outside the family was offered only to half of the 13-year-olds and 15-year-olds, with a total of 3,563 respondents.

### *Measures*

Participation in OLTA was measured using the question '*In your free time, do you do any of these organized activities?*' with dichotomous response *yes/no* (Bosakova et al., 2016). We investigated six particular types of organized leisure-time activities. The activities included *team sports* (e.g. football, basketball, volleyball), *individual sports* (e.g. tennis, gymnastics, karate), *art school* (e.g. music instruments, singing, dance, drama), *youth organizations* (e.g. Scouts, Sokol), *leisure centres or after-school clubs* (e.g. chess, model building, debate clubs), and *church meeting/singing* (e.g. Salesian choir). These were selected based on four most common groups of activities suggested by Lerner (Lerner, 2005) and supplemented by church meeting/singing given the previously shown importance of religiosity in this part of Europe (Pitel et al., 2012). In addition, we used two categories of sports (team and individual sports) as they offer different developmental experiences to youth (Hansen et al., 2010). Missing answers were considered to represent 'no' unless all six OLTA items were missing. Then the respondent was excluded, as indicated above ( $n=252$ ).

Next, the respondents were split into five groups of OLTA participation patterns based on the cluster analysis, which was carried out using the similar procedure as in the previous study on OLTA (Badura et al., 2015). 'Inactive' adolescents ( $n=1,967$ ) did not participate in any OLTA. 'Team sports' participants ( $n=1,929$ ) were engaged only in team sports. The cluster 'individual sports' ( $n=1,371$ ) comprised adolescents doing individual sports and slightly more than a half of them participated at the same time in team sports. Over half of the 'artists' ( $n=1,949$ ) engaged in an individual and/or a team sport together with arts. 'All-rounders' ( $n=3,267$ ) included the remaining respondents, with 85% of them being involved in two or more OLTA.

School performance was assessed using three school-related items from the HBSC mandatory questionnaire (Currie et al., 2014). School engagement was measured using the item '*How do you feel*



*about school at present?* We dichotomized four response categories as *I like it a lot* and *I like it a bit* vs. *I don't like it very much* and *I don't like it at all*.

School-related stress was assessed by the item '*How pressured do you feel by the schoolwork you have to do?*' The four responses were dichotomized as not being stressed (*Not at all / A little*) vs. being stressed (*Some / A lot*).

Academic achievement was measured using the item '*In your opinion, what does your class teacher think about your performance compared to your classmates?*' The four response categories were dichotomized as above-average achievement (*Very good / Good*) vs. the remainder (*Average / Below average*).

The Family Affluence Scale (FAS) was used to measure the socioeconomic status of participants. The scale consists of six items investigating *car ownership, having one's own bedroom, number of computers in the household, number of foreign family holidays, number of bathrooms, and dishwasher ownership* (Currie et al., 2014). The FAS summary score was converted to a final score, which has a consistent, normal distribution ranging from 0 to 1. Then, we created tertile groups of low (0 to .333), middle (.334 to .666), and high (.667 to 1) socioeconomic status (Elgar et al., 2015). This categorised variable was used as a control variable in the logistic regression models. The validity of the FAS has been tested both at the individual level (against the parents' reported wealth) and at the national level (against Gross Domestic Product), indicating a good validity (Currie et al., 2008). The scale also showed a good stability over time (Boyce et al., 2006).

Last, we assessed whether adolescents had someone outside their family to help them with school duties using the question '*Does anyone support you / help you with schoolwork?*' with two items: *An adult outside my family* or *One of my friends*. The respondents were considered to be supported or helped with schoolwork by a person outside their family, if they answered *yes* to at least one of the items. This question was not present in the version for 11-year-olds, and we obtained 3,374 valid responses.

More detailed information on the questionnaire used in the last HBSC survey in 2013/2014 can be found in the HBSC International Protocol (Currie et al., 2014), which can be obtained at the HBSC website: <http://www.hbsc.org/methods/>.

### *Statistical analyses*

First, we described the composition of the sample, its participation in OLTA and its education-related outcomes. The statistical significance of gender and age differences with regard to participation in particular types of OLTA and education-related outcomes was assessed by chi-square tests. Second, we split the participants on the basis of the pattern of their OLTA involvement, by using cluster analysis. We obtained five distinct clusters, which was the smallest number possible, yet having high intra-cluster similarity and at the same time low inter-cluster similarity. Third, we analysed the associations of the dichotomized overall OLTA variable (at least one activity vs. none) with school engagement, school-related stress, academic achievement and school support outside family using logistic regression analyses. For this, we assessed crude associations per education-related outcome (Model 1). Next, we adjusted for age and gender (Model 2). Last, we tested interaction effects of gender and age on the associations between participation in OLTA and the four education-related outcomes. We then repeated these analyses for the separate clusters of OLTA. Additional adjustment for socioeconomic status as measured by the FAS (Currie et al., 2014) did hardly affect findings (data not shown). The data were analysed using routine regression because multilevel analysis found no indication for clustering by school (Sigmundova et al., 2014). The statistical analyses were carried out using IBM SPSS 22 for Windows (IBM Corp. Released 2013).

## Results

The characteristics of the sample are presented in Table 6.1. In all, 81% of respondents participated in one or more OLTA ( $M = 1.51$ ,  $SD = 1.17$ ). Younger adolescents of both genders were involved in all the types of OLTA more often than older adolescents ( $p < 0.001$ ), with the exception of individual sports in boys. The breadth of activities (i.e. number of OLTA in which respondents participated concurrently) also decreased with increasing age, this trend being stronger for girls. Girls aged 11 years participated on average in 1.86 activities and girls aged 15 years in 1.20 activities. In boys the decrease was milder, from 1.67 activities at age 11 years to 1.24 activities at the age of 15.

Independently of the affiliation to an OLTA cluster, the youngest age category and girls reported higher school engagement ( $p<0.001$ ), lower levels of school-related stress ( $p=0.018$  for gender and  $p<0.001$  for age difference) and better academic achievement ( $p<0.001$ ) than the two older categories and boys, respectively. Nearly every other girl also had a non-familial person to help her with schoolwork, while in boys this was only one of three. The prevalence rates of school engagement, school-related stress and academic achievement – the three HBSC mandatory education-related items – in separate OLTA clusters are shown in Figure 6.1.

Table 6.1 Description of the study population: rate of respondents' participation in organized leisure-time activities (top part) and education-related outcomes (bottom part) by gender and age

	Gender				Age						Total	
	Boy		Girl		11		13		15		(n=10483)	
	(n=5161)		(n=5322)		(n=3324)		(n=3534)		(n=3625)		(n=10483)	
	n	%	n	%	n	%	n	%	n	%	n	%
≥1 activity	4233	82.0	4283	80.5	2895	87.1	2953	83.6	2668	73.6	8516	81.2
No activity	928	18.0	1039	19.5	429	12.9	581	16.4	957	26.4	1967	18.8
Higher school engagement	3555	69.0	4070	76.6	2591	78.0	2559	72.5	2475	68.4	7625	72.8
Low school-related stress	3649	70.8	3653	68.7	2513	75.8	2347	66.5	2442	67.4	7302	69.7
Above-average academic achievement	2754	53.5	3171	60.0	1972	59.7	1952	55.5	2001	55.4	5925	56.8
School support outside the family	542	32.5	833	48.9	N/A		660	40.1	715	41.3	1375	40.8

% represents the percentage of respondents within the column concerned (gender, age, total).

The item on school support outside family was asked for only in one of both questionnaire versions for 13-year-olds and for 15-year-olds (total n = 3,374).

Figure 6.1 Percentages of adolescents, per OLTA cluster, who liked school, felt no or only a little pressure from schoolwork and rated their achievement as above-average (total sample, n=10,483)

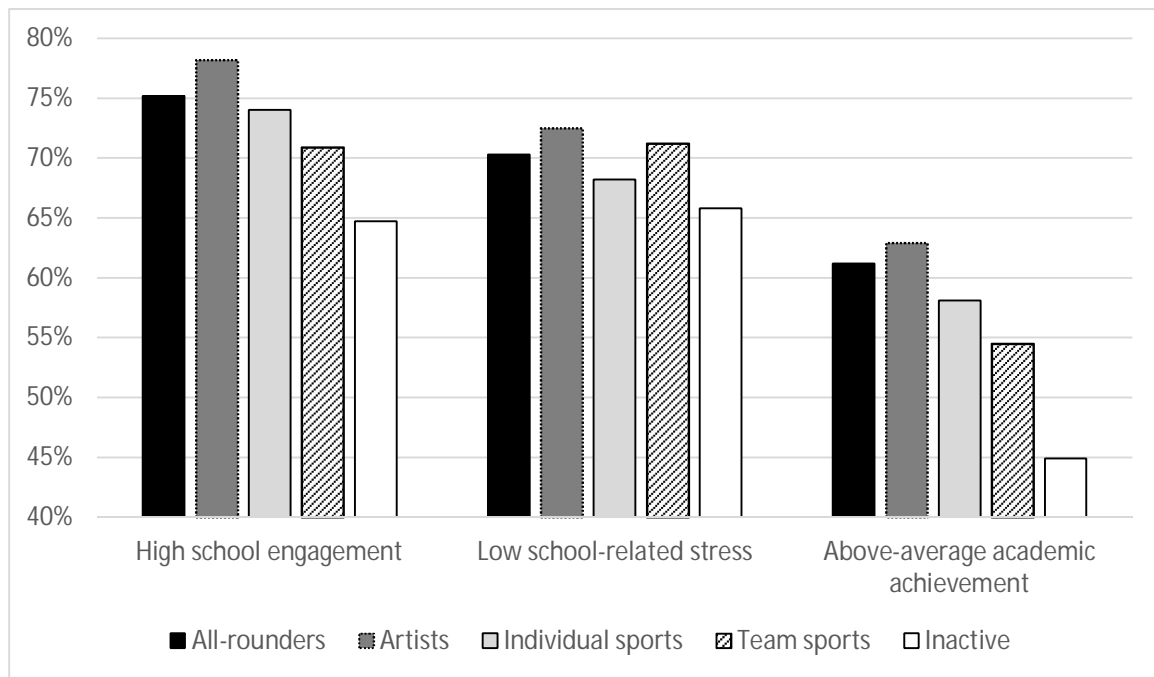


Table 6.2 presents odds ratios (OR) and 95% confidence intervals (CI) for the associations of the dichotomized participation variables with the school engagement, school-related stress, academic achievement and school support outside the family. Involvement in any OLTA was found to be significantly associated with all four explored education-related outcomes, even after adjustment for gender and age (Model 2). The strongest association was observed for academic achievement. Active adolescents had 1.81-times higher odds to self-report their achievement as good or very good. Last, we tested the interaction effects of gender and age. No interaction by gender was found to be statistically significant (data not shown). We observed a statistically significant interaction of participating in OLTA with age for getting support outside the family, with 13-year-olds being more likely to get such support when involved in at least one OLTA than 15-year-olds (OR = 1.67, CI = 1.16-2.41). This question was not asked to 11-year-olds.

Table 6.2 Association of dichotomized participation variables with education-related outcomes: odds ratios and 95% confidence intervals for active vs. inactive adolescents (reference category)

	High school engagement (a lot/a bit)	Low school-related stress (not at all/little)	Above-average academic achievement (good/very good)	School support outside family (peer and/or adult)
Model 1 (univariable)				
≥1 activity vs. inactive	1.61 (1.45-1.79)**	1.25 (1.13-1.39)**	1.81 (1.64-2.00)**	1.29 (1.09-1.53)*
Model 2 (adjusted for age and gender)				
≥1 activity vs. inactive	1.55 (1.39-1.72)**	1.20 (1.08-1.36)*	1.81 (1.64-2.00)**	1.38 (1.16-1.65)**

\*  $p < 0.01$ , \*\*  $p < 0.001$

The item on school support outside family was present only in one questionnaire version for 13-year-olds and one version for 15-year-olds (n = 3,374).

Table 6.3 shows the results of the logistic regressions using clusters of OLTA as independent variables, with the inactive cluster as the reference category. Members of all active clusters were more likely to like school and rate their academic achievement as good or very good. The strongest associations with both outcomes were observed for ‘artists’, and the weakest for those participating only in team sports. An association with lower levels of school-related stress was observed in all active clusters of OLTA, except for the ‘individual sports’ cluster. Likewise, apart from the ‘team sports’ cluster the three remaining active clusters were more likely to acquire someone outside family to help them with schoolwork than inactive adolescents.

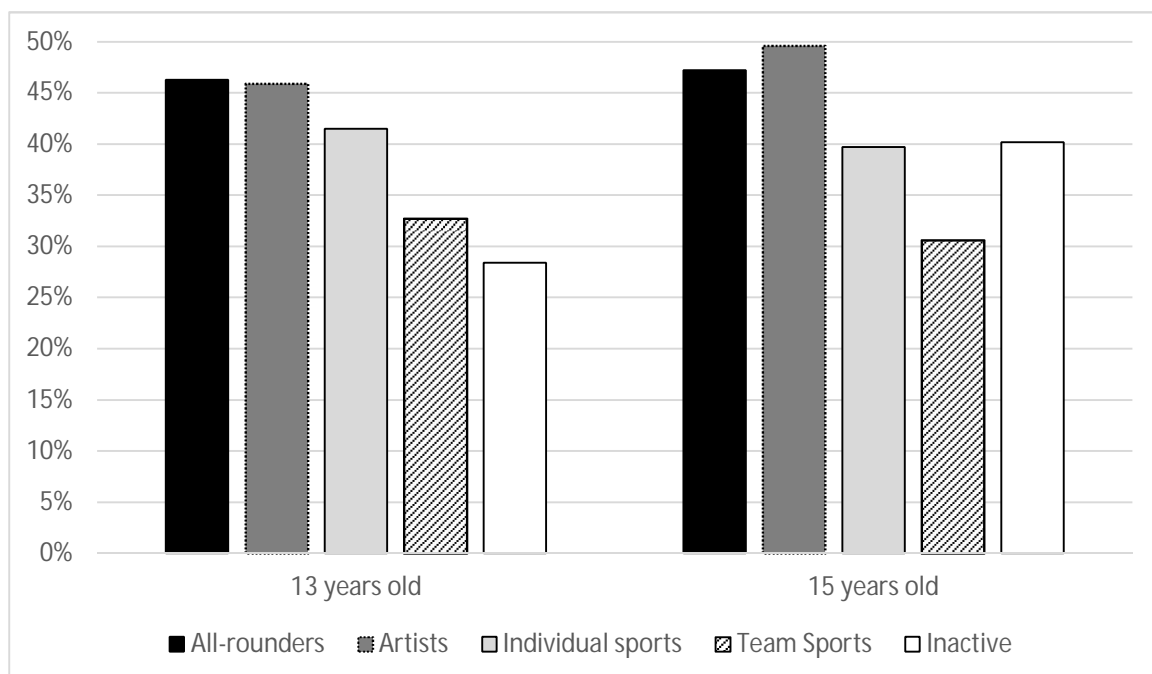
The interactions of OLTA clusters with gender were not significant (data not shown). The interaction effects of the OLTA clusters with age were not statistically significant in terms of the overall variable p-value. However, after splitting the active participants into separate clusters, we found an interaction of age with 'all-rounders' (OR = 1.58, CI = 1.03-2.41), 'individual sports' (OR = 1.78, CI = 1.08-2.93) and 'team sports' (OR = 1.83, CI = 1.15-2.93) regarding support with schoolwork outside the family (data not shown). Compared with their inactive counterparts, in all three mentioned clusters the respondents aged 13 were more likely to be supported with schoolwork by someone outside the family than those aged 15 (Figure 6.2).

Table 6.3 Association of participation in organized leisure-time activities (clusters of activity pattern) with education-related outcomes: odds ratios and 95% confidence intervals for active vs. inactive adolescents (inactive cluster is the reference category)

	High school engagement (a lot/a bit)	Low school-related stress (not at all/little)	Above-average academic achievement (good/very good)	School support outside family (peer and/or adult)
<b>Model 1 (univariable)</b>				
All-rounders	1.65 (1.46-1.87)***	1.23 (1.09-1.39)**	1.94 (1.73-2.17)***	1.55 (1.27-1.90)***
Artists	1.96 (1.70-2.26)***	1.37 (1.20-1.57)***	2.08 (1.83-2.37)***	1.62 (1.30-2.02)***
Individual sports	1.56 (1.34-1.81)***	1.12 (0.96-1.29)	1.70 (1.48-1.95)***	1.21 (0.96-1.54)
Team sports	1.33 (1.16-1.52)***	1.29 (1.13-1.78)***	1.47 (1.29-1.66)***	0.82 (0.66-1.03)
<b>Model 2 (adjusted for gender and age)</b>				
All-rounders	1.53 (1.35-1.73)***	1.15 (1.02-1.30)*	1.93 (1.72-2.17)***	1.66 (1.35-2.04)***
Artists	1.71 (1.48-1.98)***	1.34 (1.17-1.54)***	1.97 (1.73-2.25)***	1.50 (1.20-1.88)***
Individual sports	1.57 (1.34-1.82)***	1.09 (0.94-1.27)	1.73 (1.50-1.99)***	1.31 (1.03-1.67)*
Team sports	1.42 (1.24-1.63)***	1.23 (1.07-1.42)**	1.56 (1.37-1.78)***	0.99 (0.79-1.25)

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ ; The item on school support outside family was present only in one questionnaire version for 13-year-olds and one version for 15-year-olds ( $n = 3,374$ ).

Figure 6.2 Percentages of 13- and 15-year old adolescents, per OLTA cluster, having someone outside their family to support them with schoolwork ( $n=3,374$ ); the question was not asked to 11-year-olds.



## Discussion

We found that participation in OLTA was associated with higher school engagement, lower levels of school-related stress and better academic achievement. Nevertheless, the associations partly differed by specific OLTA patterns. Adolescents involved in more activities at the same time showed, in general, more positive school-related outcomes than non-involved adolescents and also than those involved only in sports, though this difference was not statistically significant. Moreover, OLTA participants were more likely to have someone outside the family to help them with schoolwork, with this association being weaker in 15-year-olds.

Adolescents involved in any type of OLTA reported better than their inactive peers on all four education-related outcomes included in this study. This finding is in line with previous research, predominantly from the USA, linking OLTA to students' improved school performance and higher bonding to school (Fredricks, 2012; Knifsend & Graham, 2012). It might thus be inferred that the mechanism underlying participation in OLTA, as suggested for the US setting, i.e. utilizing contextual developmental assets to nurture individual strengths (Lerner et al., 2012; Mueller et al., 2011), might also be applicable to the European school and leisure environment.

We also found that different patterns of OLTA participation (clusters of OLTA) had varying associations with school performance and school engagement. Adolescents participating only in sports, either team and/or individual ones, reported performing better on all the analysed education-related outcomes than the inactive adolescents. This is in agreement with the recent findings linking moderate physical activity throughout adolescence to better cognitive performance at young adulthood (Esteban-Cornejo et al., 2015) and, more specifically, sports participation to better mathematic performance (Domazet et al., 2016). Moreover, the adolescents participating in more than just in sports, i.e. members of 'artists' or 'all-rounders' clusters reported even better outcomes than those participating only in sports. This accords with the results of one of the few European studies on this topic, by Metsäpelto & Pulkkinen (2012), who observed stronger association between performing arts and higher academic working skills and academic attainments compared with sportsmen.

Considering that over a half of artists and a vast majority of all-rounders participated in two or more activities, our findings support the assumption that the more activities adolescents are involved in, the better it is for them (Dworkin et al., 2003; Fredricks & Eccles, 2006b; Mahoney & Cairns, 1997). Involvement in a variety of distinct out-of-school contexts exposes adolescents to a range of different situations, challenges and diverse persons, which both enriches their social networks and lets them adopt skills helpful for coping with their school life (Hansen et al., 2003). The finding is also remarkable in light of previous research on OLTA and health (Badura et al., 2015), which contrarily showed the strongest association with physical and mental health in youth participation only in sports. This clearly underlines the hypothesised uniqueness of the link between different activities (pattern of activities in our case) and various youth developmental indicators (Hansen et al., 2010; Larson et al., 2006; Rose-Krasnor et al., 2006).

All-rounders, artists and individual sports participants were also more likely to acquire non-familial support for schoolwork. However, we observed an interaction effect of age on this outcome, with 13-year-olds being more likely to get such support than 15-year-olds when affiliated to one of the OLTA clusters (except for the artists, in which the association did not differ by age). This was probably due to the noticeable increase in the number of inactive adolescents with such support between 13 and 15 years of age. In the Czech Republic, the 9<sup>th</sup> grade (15-year-olds) is the last one before transition to the secondary school. It appears that inactive youth, who generally do worse in school, try to compensate for their poor performance through receiving extracurricular tutoring in order to increase their chance to get accepted to the desired school. This would be in line with Himelfarb et al. (2014), who found that the frequency of academic tutoring was associated with worse school grades. Moreover, it could be a cause of the weaker associations between OLTA participation and school support outside the family in older adolescents.

*Strengths and limitations*

The most important strength of this study is its large and representative sample. Furthermore, this study was based on the well-established and recognized HBSC study, with a strong methodological background regarding data collection procedures and construction of the questionnaire, which is subject to regular revisions by an international expert team.

Our findings need to be interpreted in light of some limitations, however. First, the cross-sectional design hinders the potential for conclusions on causality between participation in OLTA and enhanced education-related outcomes. Second, we used self-reported data, which might be more prone to be biased. However, the mandatory school-related items have been included in the HBSC study since 1985/1986 (school-related stress since 1993/1994) and widely used (Currie et al., 2014; Haapasalo et al., 2010; Pickett et al., 2006; Torsheim et al., 2001). The academic achievement item has been shown to be a valid and reliable question (Felder-Puig et al., 2012; Vereecken, 2001) and the validation works on the two remaining items were ongoing at the time of the last 2013/2014 HBSC survey (Currie et al., 2014). Last, we did not collect information on other dimensions of OLTA, including intensity, duration and engagement, which are known to have unique links to developmental outcomes (Bohnert et al., 2010) and might have had affected the associations found.

*Implications*

The findings of this study demonstrate the associations between involvement in OLTA and improved education-related outcomes in adolescents in a European context and confirm findings from the USA. The present results highlight the previously proposed benefits of participation in various activities concurrently, which leads to more positive outcomes. The study also shows that OLTA participation provides youth with opportunities to meet new people possibly influential for their school performance. It can serve as a form of 'resource compensation' and reduce the achievement gap between less and more academically successful youth (Morris, 2015), in younger age categories in particular. As a result, participation in OLTA might contribute to a prospective academic career (Gibbs et al., 2015) and subsequently also to the work-career development of current adolescents. Future research should focus on analysing the causal relationship between OLTA and education-related outcomes in Europe, because, to the best of our knowledge, such work has not yet been conducted.

**Conclusion**

The associations between participation in OLTA and better education-related outcomes observed in this study indicate that previously suggested benefits of OLTA for adolescents' education might also apply to the European context. Our findings may serve as a cue that OLTA improve the relationship to school and the school performance in youth.



## Can organized leisure-time activities buffer the negative outcomes of unstructured activities for adolescents' health?

Petr Badura, Andrea Madarasova Geckova, Dagmar Sigmundova, Erik Sigmund, Jitse P. van Dijk, & Sijmen A. Reijneveld

*Published as: International Journal of Public Health, July 2018, Volume 63, Issue 6, pp 743-751*

### Abstract

*Objectives:* We aimed to assess the associations of involvement in selected unstructured activities (UA) with health-risk behaviours and academic achievement, and the degree to which the participation in organized leisure-time activities (OLTA) changes these associations.

*Methods:* Using a sample of 6,935 Czech adolescents aged 13 and 15 years, we investigated adolescents' weekly involvement in hanging out, visiting shopping malls for fun and meeting friends after 8 p.m., OLTA and three health-risk behaviours and academic achievement.

*Results:* Weekly involvement in the selected UA was associated with higher odds for regular smoking, being drunk, having early sexual intercourse and low academic achievement. Concurrent participation in OLTA did not buffer these negative outcomes, except for sexual experience. However, those highly engaged only in UA were more likely to participate in the health-risk behaviours and report worse academic achievement than those participating in any OLTA concurrently.

*Conclusion:* The selected UA are strongly associated with an increased occurrence of adolescents' health-risk behaviours and low academic achievement. Concurrent participation in OLTA does not buffer these negative outcomes significantly, but adolescents engaged only in UA consistently report the least favourable outcomes.

### Keywords:

Adolescence, Extracurricular activities, Unstructured leisure, Substance use, Sexual intercourse, School performance



## Introduction

In western industrialised countries, leisure time comprises approximately half of adolescents' waking hours, with a slightly higher amount of leisure time recorded in North America than in Europe (Larson and Verma 1999; Wight et al. 2009). Unlike school, household chores or personal care (e.g. sleep or hygiene), it offers room for a wide range of activities. Regardless of geographical location, it is therefore typified by more pronounced inter-individual differences in its content, as well as distinct associations with health and developmental indicators. Some sorts of activities (e.g. organized activities) can be considered as health-enhancing and supporting development (Larson 2000; Mahoney et al. 2006). Oppositely, some specific unstructured activities, such as frequent visits to shopping malls for fun or hanging out in public places on a regular basis, might pose a threat to adolescent health (Caldwell and Faulk 2013).

Engagement in unstructured activities (UA) is frequently associated with problematic outcomes, but not all UA can be labelled as risky (Bradley 2010; Sharp et al. 2015). UA that actually expose youth to health risks have the following characteristics: adult-unsupervised, lack of skill-building aims, taking place in public and especially having a strong socializing character (Mahoney et al. 2004; Osgood et al. 2005; Weerman et al. 2015). Data from both Europe and the U.S. support the conclusion that settings with such features offer adolescents space for engagement in risky behaviours (Augustyn and McGloin 2013, Lee and Vandell 2015) and are appealing to adolescents who are generally more vulnerable to these behaviours (Mahoney et al. 2004; Persson et al. 2007). Indeed, youth who spend a lot of time in such activities with little or no structure have been reported to have higher rates of substance use (Kiesner et al. 2010; Pulver et al. 2015), potentially risky sexual activity (Barnes et al. 2007) and to do worse in school, both in terms of grade point average and honours or recognitions earned (Nelson and Gastic 2009).

Organized leisure-time activities (OLTA) are in fact exactly opposite of such UA, as they are characterized by having a certain structure, a regular schedule, clearly defined goals and rules, focusing on skill-building and being adult-supervised (Larson 2000; Mahoney et al. 2006). In contrast to socializing UA, youth in OLTA experience higher levels of intrinsic motivation and challenge at the same time (Hansen et al. 2003). This promotes a development of initiative, identity formation, building of teamwork skills and social capital (Hansen et al. 2003) and links OLTA to healthy developmental outcomes (Farb and Matjasko 2012). Compared to those not participating in OLTA, participants in OLTA report better health (Badura et al. 2015; Leversen et al. 2012) or school performance (Badura et al. 2016; Fredricks 2012) and, oppositely, a lower occurrence of health-risk behaviours (Badura et al. 2017; Takakura 2015), as observed in studies from the U.S., Europe and Japan.

As is apparent from the findings described in the two preceding paragraphs, the developmental outcomes of OLTA (i.e. highly structured) and UA are contradictory. However, OLTA and UA obviously are not mutually exclusive categories of leisure time. A noteworthy group of U.S. adolescents participate in OLTA and, at the same time, are involved in a range of UA (Bartko and Eccles 2003; Sharp et al. 2015). However, little is known if (and how) outcomes for those concurrently involved in risky UA and OLTA are distinct from those involved only in UA. An understanding is needed of how the adolescents cope with combining these two sorts of leisure-time activities with 'conflicting' characteristics and outcomes regarding health-risk behaviours and school performance.

First, our study aimed to assess the associations between three 'risky' UA and indicators of healthy youth development (health-risk behaviours and academic achievement). Given the gender, age, as well as socioeconomic differences both in the leisure time content (Badura et al. 2015; Sharp et al. 2015) and health-risk behaviours (Inchley et al. 2016), we checked if these mentioned confounding factors modified the associations. Last, we also investigated the degree to which participation in OLTA changed these associations and how adolescents differed regarding the above indicators according to their involvement in unstructured and organized leisure-time activities.

## Methods

### *Sample and procedure*

Our data come from the Czech Health Behaviour in School-aged Children (HBSC) study, which was conducted between April and June 2014. The surveyed schools were randomly selected from the database of Ministry of Education, Youth and Sports of the Czech Republic. Out of the 244 schools approached after stratification by region and ratio of primary and secondary schools, 243 gave consent to conduct the survey. At each of the participating schools, one class from the 5<sup>th</sup>, 7<sup>th</sup> and 9<sup>th</sup> grades (corresponding to age categories 11, 13, and 15 years) was then picked up at random. The questionnaires were administered by trained research assistants during regular class time and in the absence of teachers to minimize potential response bias. Participation in the study was voluntary and anonymous, with no incentives offered to respondents. Prior to administration of the questionnaires the respondents were notified about the possibility to opt out. The Ethics Committee of the Faculty of Physical Culture, Palacky University, Olomouc, approved the study design (No. 57/2014).

There were 16,298 pupils registered in the surveyed classes, and 14,539 of them completed the questionnaires. Thirty pupils refused to take part in the survey, and 1,729 pupils were not present at school during the survey, with the most common reason being an illness. Then, we selected only 13- and 15-year old adolescents, because the questions on UA were not asked to those aged 11 years. Finally, we excluded respondents who were classified as age-outliers (e.g. a 15-year-old completing the questionnaire for 7<sup>th</sup> graders/13-year-olds) or failed to provide data on gender, OLTA or UA. Those missing one or two responses out of the three UA items were only included in the analyses if we could unambiguously classify them as highly engaged in UA, i.e. one of their valid responses was *daily* or two of their valid responses were *weekly or more often*. The final sample comprised 6,935 adolescents (49.1% boys).

### *Measures*

We investigated involvement in three various peer-oriented UA. The respondents were asked how often they (a) *met their friends after 8 o'clock*, (b) *visited shopping malls for fun or distraction*, (c) *hung out with their friends in their neighbourhood, park, at playgrounds, etc.* We then categorized them into those doing these activities *weekly or more often* vs. those doing them *less frequently*. We assessed these three activities separately and also derived a composite variable of being involved in *any of the unstructured activities on a daily basis or in at least two such activities at least weekly* as an indicator of high engagement in UA.

Regarding OLTA, the respondents indicated whether they participated in the following six types of activities: *team sports, individual sports, art schools, youth organizations, leisure centres or after-school clubs, and church meeting/singing*. Those involved in at least one OLTA were categorized as *participants*, while the rest as *non-participants*. Last, we split the adolescents into four categories based on their leisure-time activities: (1) involved *neither in OLTA nor UA*, (2) involved *only in OLTA*, (3) involved *both in OLTA and UA*, and (4) involved *only in UA*.

We used four dependent variables in our analyses from the pool of the HBSC mandatory questions (Currie et al. 2014) and dichotomized them according to the most recent HBSC international report (Inchley et al. 2016). Academic achievement was measured using the question: *'In your opinion, what does your class teacher think about your performance compared to your classmates?'* The responses were dichotomized as above-average achievement (*very good / good*) vs. the remainder (*average / below average*).

Current smoking was assessed by the question: *'How often do you smoke tobacco at present?'* Four response categories were dichotomized as *every day* or *at least once a week* vs. *less than once a week* or *I do not smoke*.

Drunkness was assessed by the question: *'In the last 30 days, have you had so much alcohol that you were really drunk?'* The respondents were split into those who indicated being drunk *at least once in the last 30 days* vs. those *not being drunk in the last 30 days*.

Last, we investigated lifetime experience with early sexual intercourse. This was done using the question *'Have you ever had sexual intercourse (sometimes this is called "making love", "having sex", etc.)?'*, with dichotomous response option *yes* vs. *no*. The question was asked only to 15-year-olds.

Socioeconomic status of adolescents' families served as a control variable in our analyses. It was assessed using the Family Affluence Scale (FAS) developed for the purposes of the HBSC study (Currie et al. 2014). The responses on six items (*car ownership, holidays abroad, having one's own bedroom, number of computers in the household, number of bathrooms, and dishwasher ownership*) were summed up. We then transformed the sum into a fractional rank score (0-1) (Elgar et al. 2017), with a higher value indicative of a higher level of affluence.

### *Statistical analyses*

First, we described the sample, its involvement in UA and OLTA, its self-reported academic achievement and engagement in health-risk behaviours. The statistical significance of gender- and age-differences was examined by chi-square tests.

Second, we assessed the associations of specific UA (both the separate activities and the composite variable) with academic achievement and health-risk behaviours using binary logistic regression. This was done in five steps – a crude model (Model 1), adjusted for age and gender (Model 2) and further adjusted for socioeconomic status, as indicated by FAS (Model 3). For the composite variable (at least on UA daily or at least two UA weekly) we also tested the interaction with the association of gender (Model 4) with the association and of age category (Model 5).

Next, we tested the 'buffering effect' of OLTA on the associations of UA (participation in at least two of them weekly) with academic achievement and health-risk behaviours. The OLTA variable was added to the model, and the 'buffering effect' was assessed by the interaction between OLTA and at least two UA. To assess the stability of our results, we also ran the regression analyses using the pattern of OLTA participation, as previously derived by cluster analysis (Badura et al. 2015), which is indicative of the breadth of such participation. The outputs were very similar to those reported in the paper, so for sake of brevity we used the simple dichotomous OLTA variable (at least one OLTA vs. none) in the end.

Lastly, we ran the logistic regression with four categories for the combination of OLTA and UA involvement as independent variables (with those involved only in OLTA and UA concurrently as a reference category) to assess the differences between adolescents involved both in OLTA and UA and the rest of the sample, especially those involved only in UA.

Multilevel analyses of the risk behaviours and school-related outcomes on the Czech 2013/2014 HBSC sample did not indicate the data to cluster by school (Badura et al. 2016; Badura et al. 2017). For this reason, we used ordinary single-level regression models to assess the associations in the present study.

## Results

### *Involvement in unstructured and organized leisure-time activities*

Out of the three investigated UA, hanging out with friends was the most prevalent one (Table 7.1). Approximately half of the respondents indicated doing it several times a week. Around a quarter of them visited shopping malls for fun regularly, and 16% met their friends after 8 o'clock in the evening, with the latter activity being significantly more common among 15-year-olds than among younger adolescents. Slightly over one third of the respondents reported being involved in any of these UA on a daily basis or two or more UA at least weekly. Regarding OLTA, almost 80% of respondents took part in one or more such activity, with slightly higher rates in boys than in girls, and in 13-year-olds than in 15-year-olds.

Table 7.1 Description of the study population: rates of respondents' involvement in unstructured and organized activities, health-risk behaviours and self-reported academic achievement by gender and age category; Health Behaviour in School-aged Children study (HBSC), Czech Republic, 2013–2014.

	Gender		Age		Total (n=6,935)	missing values
	Boy (n=3,408)	Girl (n=3,527)	13 years (n=3,415)	15 years (n=3,520)		
<b>Unstructured activities</b>						
Hanging out (several times a week)	1,548 (45.4%)	1,884 (53.4%)*	1,719 (50.3%)	1,713 (48.7%)	3,432 (49.5%)	2
Visiting shopping malls for fun (several times a week)	818 (24.0%)	1,120 (31.8%)*	1,027 (30.1%)*	911 (25.9%)	1,938 (27.9%)	1
Meeting after 8pm (at least weekly)	626 (18.5%)*	499 (14.2%)	363 (10.7%)	762 (21.8%)*	1,125 (16.3%)	36
High overall UA engagement (at least one UA daily or two at least weekly)	1,044 (30.6%)	1,336 (37.9%)*	1,155 (33.8%)	1,225 (34.8%)	2,380 (34.3%)	0
<b>Organized activities</b>						
Organized activities (at least one)	2,732 (80.2%)*	2,719 (77.1%)	2,857 (83.7%)*	2,594 (73.7%)	5,451 (78.6%)	0
<b>Dependent variables</b>						
Current smoking (weekly)	299 (8.8%)	378 (10.8%)*	149 (4.4%)	528 (15.1%)*	677 (9.8%)	36
Drunkenness in the last 30 days (once or more)	415 (12.5%)	400 (11.6%)	180 (5.4%)	635 (18.5%)*	815 (12.0%)	153
Sexual intercourse † (yes)	359 (21.2%)	423 (24.3%)*	N/A	782 (22.8%)	782 (22.8%)	86
Academic achievement (average or worse)	1,603 (47.2%)*	1,453 (41.5%)	1,511 (44.5%)	1,545 (44.1%)	3,056 (44.3%)	42

† The item was present only in the questionnaire version for 15-year-olds

N/A - not available: % represents relative rate of valid responses

\* Indicates statistically significant ( $p < 0.05$ ) difference in relative rates by gender or age per variable - based on  $\chi^2$  tests

### *Unstructured activities, health-risk behaviours and academic achievement*

Table 7.2 presents odds ratios (OR) and 95% confidence intervals (95% CI) for the associations of the three selected UA with self-reported health-risk behaviours and academic achievement. Involvement in any of these three activities was significantly associated with higher odds for regular smoking, being drunk recently, having sexual intercourse, and low academic achievement. ORs for the univariable model (Model 1 - not shown) and the models adjusted for the gender and age category (Model 2) and additionally FAS (Model 3) hardly differed. Meeting friends after 8 o'clock in the evening showed the strongest associations out of all the dependent variables.

None of the interaction effects of gender on the associations of high engagement in UA was statistically significant. Regarding interaction effects of age category, we observed only 15-year-olds who reported excessive engagement in UA to have higher odds of current smoking than 13-year-olds (Table 7.2; Model 5). The interactions with the other dependent variables were not statistically significant.

Table 7.2 Odds ratios (OR) and 95% confidence intervals (CI) for low self-reported academic achievement, substance use and experience with sexual intercourse for adolescents engaged in unstructured leisure-time activities vs. those not involved in these activities; Health Behaviour in School-aged Children study (HBSC), Czech Republic, 2013–2014.

	Current smoking (at least weekly) OR (95% CI)	Drunkenness last 30 days (once or more) OR (95% CI)	Sexual intercourse † (yes) OR (95% CI)	Academic achievement (average or worse) OR (95% CI)
<i>MODEL 2 adjusted for gender and age</i>				
Hanging out	3.31*** (2.763-3.98)	2.57*** (2.19-3.01)	2.33*** (1.97-2.75)	1.13* (1.03-1.25)
Visiting shopping malls for fun	2.33*** (1.97-2.76)	2.13*** (1.82-2.50)	2.30*** (1.93-2.73)	1.32*** (1.18-1.46)
Meeting friends after 8pm	4.28*** (3.59-5.10)	4.22*** (3.58-4.97)	4.67*** (3.90-5.59)	1.47*** (1.29-1.67)
High UA engagement	4.75*** (3.98-5.65)	3.50*** (3.00-4.09)	3.66*** (3.10-4.33)	1.42*** (1.29-1.57)
<i>MODEL 3 adjusted for gender, age and FAS</i>				
Hanging out	3.30*** (2.75-3.96)	2.57*** (2.19-3.02)	2.35*** (1.99-2.77)	1.13* (1.02-1.24)
Visiting shopping malls for fun	2.35*** (1.99-2.79)	2.13*** (1.82-2.49)	2.29*** (1.93-2.72)	1.33*** (1.19-1.48)
Meeting friends after 8pm	4.36*** (3.65-5.20)	4.22*** (3.58-4.97)	4.66*** (3.89-5.58)	1.49*** (1.31-1.70)
High UA engagement	4.75*** (4.00-5.66)	3.50*** (3.00-4.09)	3.68*** (3.12-4.35)	1.42*** (1.29-1.57)
<i>MODEL 4 interaction with gender, adjusted for age and FAS</i>				
Main effect – Gender (boy vs. girl)	0.79 (0.60-1.04)	1.09 (0.86-1.36)	0.91 (0.72-1.16)	1.36*** (1.20-1.53)
Main effect – High UA engagement	4.31*** (2.84-4.44)	3.23*** (2.59-4.03)	3.68*** (2.92-4.63)	1.49*** (1.29-1.71)
Interaction – Boy * High UA engagement	1.24 (0.87-1.75)	1.17 (0.86-1.59)	1.00 (0.72-1.40)	0.90 (0.74-1.11)
<i>MODEL 5 interaction with age, adjusted for gender and FAS</i>				
Main effect – Age (15 vs. 13 yrs.)	2.95*** (2.17-4.01)	3.71*** (2.84-4.84)	N/A	0.97 (0.86-1.09)
Main effect – High UA engagement	3.27*** (2.33-4.60)	2.99*** (2.20-4.07)	N/A	1.41*** (1.22-1.63)
Interaction – Age 15 * High UA engagement	1.64* (1.11-2.44)	1.23 (0.86-1.76)	N/A	1.02 (0.83-1.24)

\*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ ; FAS – Family Affluence Scale; UA – unstructured activities; N/A – not available

† The question on sexual intercourse was asked only to 15-year-olds.

*'Buffering effect' of organized activities on the negative outcomes of unstructured activities*

Next, we assessed the potential 'buffering effect' of OLTA on the negative outcomes related to high engagement in UA (Table 7.3). We found an interaction effect of OLTA participation with involvement in UA regarding sexual intercourse (OR = 0.64; 95% CI = 0.44-0.93). This indicates that those engaged highly in UA were less likely to have a sexual experience when involved in OLTA, too, compared with those not involved in OLTA. None of the other interactions was statistically significant.

Table 7.3 Odds ratios (OR) and 95% confidence intervals (CI) for, substance use, experience with sexual intercourse and low self-reported academic achievement, including the interaction between involvement in unstructured and organized activities; Health Behaviour in School-aged Children study (HBSC), Czech Republic, 2013–2014.

	Current smoking (at least weekly) OR (95% CI)	Drunkenness last 30 days (once or more) OR (95% CI)	Sexual intercourse † (yes) OR (95% CI)	Academic achievement (average or worse) OR (95% CI)
<i>Main effect</i>				
High UA involvement (at least one UA daily or two at least UA weekly)	5.35*** (3.87-7.40)	4.14*** (3.02-5.68)	5.16*** (3.73-7.14)	1.44** (1.15-1.81)
OLTA (at least one)	0.74* (0.55-1.00)	1.00 (0.77-1.31)	1.01 (0.77-1.32)	0.55*** (0.47-0.63)
<i>Interaction effect</i>				
≥1 OLTA * high UA involvement	0.87 (0.59-1.27)	0.81 (0.56-1.16)	0.64* (0.44-0.93)	1.01 (0.78-1.30)

The model above was adjusted for gender, age and FAS.

\*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$

FAS – Family Affluence Scale; OLTA – organized leisure-time activities; UA – unstructured activities.

† The question on sexual intercourse was asked only to 15-year-olds.

Lastly, we also investigated the effects per combination of UA and OLTA, with adolescents involved in both OLTA and UA as a reference category, as they were of special interest to the present study (Table 7.4). Compared with adolescents highly engaged only in UA, those involved both in UA and OLTA had lower odds regarding all four dependent variables assessed; however, the OR regarding recent drunkenness was not statistically significant. Those involved in UA and OLTA concurrently were, nonetheless, more likely to smoke regularly and have experience with sexual intercourse than adolescents involved only in OLTA or uninvolved in any of the leisure-time activities – organized or unstructured – investigated in the study. On the other hand, and unlike adolescents only in OLTA, the uninvolved group had higher odds of doing worse at school than those involved both in OLTA and UA.

Table 7.4 Odds ratios (OR) and 95% confidence intervals (CI) for above-average self-reported academic achievement, substance use and experience with sexual intercourse for various combinations of leisure-time activities; Health Behaviour in School-aged Children study (HBSC), Czech Republic, 2013–2014.

	Current smoking (at least weekly) OR (95% CI)	Drunkenness last 30 days (once or more) OR (95% CI)	Sexual intercourse † (yes) OR (95% CI)	Academic achievement (average or worse) OR (95% CI)
Both OLTA and UA (n=1,905)	<i>ref</i>	<i>ref</i>	<i>ref</i>	<i>ref</i>
Only OLTA (n=3,546)	0.22*** (0.18-0.27)	0.30*** (0.25-0.36)	0.30*** (0.25-0.37)	0.69*** (0.61-0.77)
Neither OLTA nor UA (n=1,009)	0.29*** (0.22-0.39)	0.30*** (0.23-0.39)	0.30*** (0.23-0.39)	1.26** (1.07-1.47)
Only UA (n=475)	1.56*** (1.22-1.99)	1.24 (0.97-1.59)	1.55** (1.19-2.03)	1.81*** (1.47-2.23)

The model above was adjusted for gender, age and FAS.

\*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$

FAS – Family Affluence Scale; OLTA – organized leisure-time activities; UA – unstructured activities.

† The question on sexual intercourse was asked only to 15-year-olds.

## Discussion

The present study showed that participation in peer-oriented UA, such as regular hanging out, visiting shopping malls for fun and meeting with friends in the evening, was associated with more frequent smoking, getting drunk, having early sexual intercourse and performing worse in school. This was, in general, independent of respondents' gender, age and socioeconomic status. Concurrent participation in OLTA did not buffer these negative outcomes, except for experience with sexual intercourse. However, adolescents involved only in UA indicated less favourable outcomes on regarding smoking, sexual intercourse and academic achievement than those involved concurrently in UA and OLTA.

Adolescents engaged in the selected UA at least weekly were more prone to substance use, sexual intercourse and low academic achievement compared with their unengaged peers. Our findings are in accordance with a significant body of literature that reported these sorts of activities to be predictive of antisocial and norm-breaking behaviours (Augustyn and McGloin 2013; Haynie and Osgood 2005; Hoeben and Weerman 2016) or linked to worse school performance (Bae and Wickrama 2015; Nelson and Gastic 2009) and increased rates of substance use (Lee and Vandell 2015; Spilkova 2015). UA appear to attract adolescents who generally incline towards health-risk and delinquent behaviours (Mahoney et al. 2004; Persson et al. 2007), and exposure to such peers is one of the frequently discussed reasons for the negative outcomes of UA (Haynie and Osgood 2005; Hoeben and Weerman 2016; Svensson and Oberwittler 2010). It is thus possible that risky behaviours and an inclination to UA involvement simply form interrelated features of an underlying personality trait.

However, there is also a complementary explanation for the association of high engagement in UA with health-risk behaviours. It seems that risk-taking in UA is driven mainly by situational motivation and, thus, the root cause lies inherently in the nature of these activities. They provide youth with opportunities for health-risk behaviours (Haynie and Osgood 2005; Hoeben and Weerman 2016; Persson et al. 2007; Siennick and Osgood 2012). This may also explain the fact that adjustment for gender, age and socioeconomic status hardly affected the associations observed. High engagement in unsupervised peer-oriented UA therefore appears to be risky across social strata for both adolescent boys and girls.

The 'buffering effect' of concurrent OLTA participation on negative outcomes of engagement in UA was not statistically significant, except for sexual experience. This is somewhat surprising, given the relatively strong evidence linking OLTA to healthy development (Farb and Matjasko 2012). However, it is in line with some authors who warned against exaggeration of the assumed 'positive' effects of participation in OLTA (Fredricks and Eccles 2006; Larson 2000), which could actually be weaker than previously suggested. Moreover, this finding advocates for studying more general patterns of leisure-time use, including a wider array of structured and unstructured leisure-time activities of adolescents when investigating their developmental outcomes (Nelson and Gastic 2009; Sharp et al. 2015).

However, those involved only in UA were more likely to engage in substance use, have sexual intercourse and have worse academic achievement than those involved in both OLTA and UA. Those with only UA and no OLTA might more often feel bored during leisure time or lack of meaningful leisure opportunities. This has been shown to be associated with increased rates of substance use (Weybright et al. 2015) and sexual activity (Miller et al. 2014). On the other hand, those that are concurrently involved in OLTA, implying being a member of a certain social group, might feel less need to stabilise their position through health-risk behaviours (Viau et al. 2015) and might also have less time and fewer opportunities to engage in such behaviours. Nonetheless, it is apparently not enough to participate in OLTA in order to avoid health-risk behaviours, but one should also avoid major UA involvement.

*Strengths and limitations*

The main strengths of our study are its large nationally representative sample and use of the well-established HBSC methodology. However, our study has also some limitations. First, we used self-report questionnaires, which can be sensitive to bias (e.g. due to social desirability or recall bias). We limited this risk by administering the questionnaire anonymously in the absence of teachers. Moreover, most of the measures we used were well-validated (Currie et al. 2014). Second, no conclusions regarding causality of the observed associations can be drawn due to the cross-sectional design of the study. Third, our dichotomous measure of OLTA participation can be considered somewhat crude. However, repeating the analyses also with a pattern of OLTA participation yielded similar results as those with dichotomized OLTA. Nonetheless, we still missed information regarding frequency, engagement in, or duration of OLTA participation, which could have provided deeper insight into the topic.

*Implications*

Weekly involvement in UA, including hanging out, visiting shopping malls for fun and meeting friends after 8 p.m., was associated with significantly low academic achievement, regular smoking, drunkenness and experience with sexual intercourse. If causal, increase in youth-appealing leisure opportunities could lead to prevention of health-risk behaviours through reduction of UA involvement, because time is a finite resource. This was recently observed by Motamedi et al. (2016), particularly in girls. Next, parental awareness and control of their children's leisure-time activities would perhaps act similarly, as concluded by previous research (Barnes et al. 2007; Kiesner et al. 2010).

Our study provides some hints that participation in OLTA may reduce the occurrence of health-risk behaviours, even though the 'buffering effect' of organized activities on negative outcomes of UA was not significant. More evidence is needed using more detailed measures of OLTA participation, because the measure we used was only dichotomous. Future research should therefore focus on particular dimensions of OLTA participation, such as intensity of participation, engagement or quality of program, with more detailed data on the participation probably providing more cues for understanding and intervening.

**Conclusions**

Involvement in peer-oriented unstructured activities is strongly associated with an increased risk of smoking, getting drunk, experience with sexual intercourse and worse academic achievement in adolescence. Except for sexual experience, concurrent participation in organized activities did not significantly buffer these negative outcomes, but adolescents involved only in unstructured activities were the most at-risk group. They were more likely to smoke, experience sexual intercourse and do worse at school than those involved in organized and unstructured activities concurrently.





## General discussion

The main aim of the present thesis was to examine the associations of adolescents' participation in organized leisure-time activities (OLTA) with health- and school-related outcomes in the context of the family environment. The thesis aimed further to investigate if participation in OLTA could 'buffer' the negative outcomes of involvement in unsupervised unstructured activities (UA). Finally, we also assessed whether gender, age and particularly the pattern of involvement in OLTA modified the associations with health- and school-related outcomes in adolescents.

In this chapter, we summarise the findings reported in Chapters 3 to 7 and discuss them in the context of previous scientific research. Then, the strengths and limitations of the present thesis are considered, as well as implications for practice and potential directions for future research.

### 8.1 Summary of the main findings

The main findings are summarised per each of the five research questions (RQ).

#### *RQ1*

*Do family environment factors relate to adolescents' participation in organized leisure-time activities?*

Perceived family support and the presence of parental screen-time rules were associated with higher odds of OLTA participation. Moreover, adolescents playing sports, indoor games and going for walks with their families at least weekly were more likely to participate in OLTA. Conversely, those spending time in joint family TV/video watching on most days were less likely to do so. A supportive family environment and direct parental involvement in their children's leisure are associated with adolescents' participation in OLTA.

#### *RQ2*

*Is participation in organized leisure-time activities associated with adolescents' physical and mental health?*

OLTA participants were more likely to report excellent self-rated health and high life satisfaction than non-participants, regardless of gender, age and pattern of participation. Participation in team and/or individual sports was, however, associated with even better general health and less frequent health complaints, especially in boys. Girls and 11-year-olds seemed to benefit more from art activities (either alone or in combination with sports) in terms of lower occurrence of health complaints. Thus, OLTA participation was in general associated with better physical and mental health, with some variations per type of OLTA, gender and age.

#### *RQ3*

*Is participation in organized leisure-time activities associated with adolescents' substance use, violent behaviours and injuries?*

Participation in OLTA was associated with lower odds for weekly smoking, getting drunk recurrently and skipping school. In contrast, OLTA participants were more likely to get injured and fight repeatedly. Adolescents involved in art activities (in only arts or in a combination of arts and sports) consistently showed the most favourable outcomes across the dependent variables, while participation in team sports only had no associations with reduced risk-taking. In general, girls had a lower rate of engagement in health-risk behaviours than boys when participating in OLTA.

**RQ4**

*Is participation in organized leisure-time activities associated with adolescents' school functioning?*

OLTA participants were more likely to report liking school, lower levels of school-related stress and above average academic achievement than non-participants, even after adjustment for gender, age and socioeconomic status. Adolescents involved in various types of OLTA concurrently showed generally stronger associations with school-related outcomes than those completely uninvolved and even than those involved only in sports; the latter difference was non-significant though. Moreover, OLTA participants were more likely to gain support from outside the family with schoolwork, an association that was weaker in 15-year-olds.

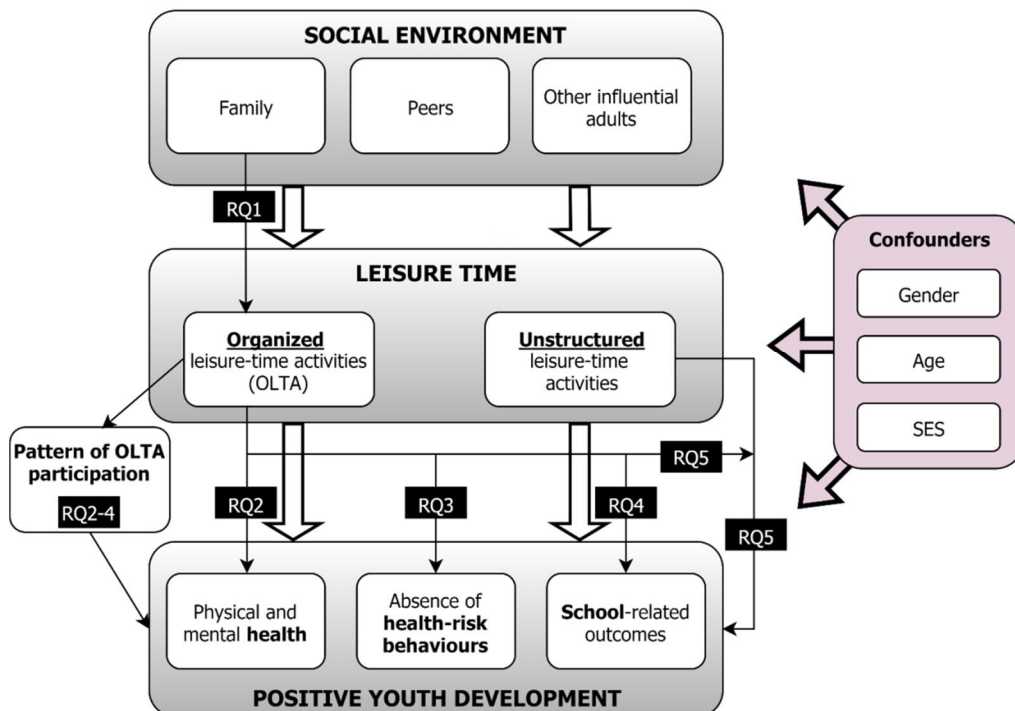
**RQ5**

*Is involvement in unstructured activities associated with health-risk behaviours and school performance, and to what extent does participation in organized leisure-time activities modify these associations?*

UA, such as at least weekly hanging out, shopping for fun or to distract oneself and meeting friends after 8 p.m., were all independently associated with regular smoking, drunkenness, experience with sexual intercourse and poor school performance. Except for sexual intercourse, these negative outcomes were not buffered by concurrent participation in OLTA. Nonetheless, those engaging only in UA were more likely to report higher rates of health-risk behaviours and do worse at school compared with those who participated in at least one OLTA as well.

The studied topics and their mutual relations are depicted in the model in Figure 8.1. The model presents assumed directions of causality between ways of spending adolescents' leisure time and related determinants (family) and outcomes (indicators of PYD). The model also shows the potential confounding effects of gender, age and socioeconomic status, as well as variation by pattern of OLTA participation.

Figure 8.1 Model of the associations assessed in the thesis



Notes: OLTA – organized leisure-time activities; RQ – research question; SES – socioeconomic status  
 → research question; ⇨ assumed causal relationship

## 8.2 Discussion and interpretation of the main findings

The findings from Chapters 3 to 7 are discussed within the framework of the main aims and related research questions (Figure 8.1). Firstly, we discuss overall, gender- and age-specific rates of Czech adolescents' participation in OLTA and compare them with findings of prior studies on this topic from other regions of the world (8.2.1). Further, we consider the role of family environment factors as a part of the social environment in these participation rates (8.2.2). Next, we focus on the associations of OLTA participation with indicators of positive youth development (health- and school-related outcomes) (8.2.3) and the variations observed in these associations by pattern of OLTA participation (8.2.4). Lastly, the potential of OLTA to 'buffer' the negative outcomes of involvement in UA is discussed (8.2.5).

### 8.2.1 Rates of participation in OLTA by gender, age and type of activity in Czech adolescents

In total, slightly over 80% of Czech 11-, 13- and 15-year-old adolescents participated in at least one OLTA. Such a rate of participation in OLTA is higher than in most studies from the U.S., which reported rates from around 65% (Eccles & Barber, 1999; Fredricks, 2012; Mahoney et al., 2006) up to roughly 75% (Eisman et al., 2016; Metzger et al., 2011; Neely & Vaquera, 2017). Similarly, a lower number of adolescents (69% of boys and 59% of girls) were found to participate in OLTA in Japan (Takakura, 2015). In contrast, slightly higher relative numbers (85%) were reported in an Australian study (Fawcett et al., 2009) and repeatedly observed (82-85%) in samples of Canadian adolescents (Forneris et al., 2015; Rose-Krasnor et al., 2006). Rates of OLTA participation in adolescents of the same age (11, 13 and 15 years) from five European countries varied between 67% and 84%, with Poland – a country bordering the Czech Republic – reporting 69% of adolescents participating (Zambon et al., 2010). These variations in the rates of OLTA participation are, to a certain extent, likely to be due to methodological differences. For instance, the above-mentioned studies used different pools of activity types or classified participants on the basis of a different participation dimension, e.g. intensity (Eisman et al., 2016). Moreover, the higher rates observed in Czech adolescents may arise from the restriction of samples in these mentioned studies to only older age categories, such as in the cases of Eisman et al. (2016), who included only those aged 14-15, or Takakura (2015), who included 15-18-year-olds. Nonetheless, the general impression remains clearly that, despite these differences, spending leisure time in an organized setting is a common experience for youth across the developed industrialised countries and non-participation in OLTA is rather unusual.

#### *Gender differences in rates of participation in OLTA*

Overall, OLTA participation rates did not significantly vary between Czech adolescent boys (82.0%) and girls (80.5%), which accords with the findings of Darling et al. (2005) who found also only a negligible difference or those of Fawcett et al. (2009) who did not observe gender differences in either the overall rates of participation or hours of involvement. However, we found differences in participation rates between boys and girls regarding particular types of activities. On the one hand, boys preferred team sports the most, with roughly 60% of them being involved, while this rate was 37% in girls. On the other hand, art activities were the most popular among girls (45%) and much less common among boys (20%). This is in accordance with a large body of previous research that presented very similar gender-related patterns in other countries (Denault & Poulin, 2009; Guevremont et al., 2014; Metzger et al., 2011; Rose-Krasnor et al., 2006; Slater & Tiggemann, 2011). It is also supported by numerous studies observing adolescent boys as being significantly more physically active than girls in most physical activity domains, including organized sports (Olds et al., 2009; Telford et al., 2016). Given that team sports are traditionally a gender-stereotyped environment (Schmalz & Kerstetter, 2006; Vilhjalmsson & Kristjansdottir, 2003), this is rather unsurprising. In contrast, arts are usually perceived to be a more 'feminine' setting (Garlick, 2004). This explanation of the gender-dependent rates can be also supported by the fact that girls have higher competence beliefs in music and the arts, while boys hold higher competence beliefs regarding sports, which is believed to be closely linked to enrolment and staying in these activities (Wigfield et al., 2006). The remaining gender differences by OLTA type were either non-significant (after-school clubs or leisure centres and religious activities) or less distinct (individual sports: 28% for boys vs. 32% for girls; youth organizations: 14% for boys vs. 12% for girls). This indicates that some OLTA might be uniformly appealing both to boys and girls, while others are still gender-specific and attract mostly boys or girls.

*Age differences in rates of participation in OLTA*

Regarding age-related variation, we observed a homogeneous trend of a decline with increasing age for participation in all six types of OLTA, but also for the breadth of participation (i.e. the number of OLTA done concurrently). This has also been observed in the past in the U.S. or Canada (Busseri & Rose-Krasnor, 2009; Eisman et al., 2016). Our finding is in line with the suggestion of Busseri and Rose-Krasnor (2009) that over the period of adolescence the breadth of participation decreases and that with the approaching transition to adulthood, youth may seek higher intensity, but in fewer activities. Furthermore, when focusing on patterns of OLTA participation, represented by clusters (introduced in Chapter 4), we observed a noteworthy exception from this age-related declining trend. The relative number of youth involved only in sports (the team and/or individual sport cluster) increased with age, i.e. was higher in older adolescents than in those aged 11. This provides additional support for the specific role of sports in youths' lives. A very likely explanation for this finding was proposed by Côté (1999), who identified three stages of sports participation: a) sampling (6-13 years) – when children try out a range of activities with an emphasis on fun and excitement in order to become interested in sports; b) specializing (13-15 years) – when youth decrease their involvement and focus on one or two specific disciplines, with fun and excitement still remaining essential; and c) investment (15 years and over) – typified by commitment to achieve an elite (or personal best) level in a single activity, thus mostly focusing on skills and strategic and competitive development. This would logically lead to leaving other activities, thus reducing the breadth of participation. Nonetheless, it does not imperatively result in a general decrease of participation intensity, as leaving one activity might only be due to time demands of a specific sports discipline. A similar principle, of course, also seems to be possibly applicable to playing a musical instrument or participation in Scouts, for instance.

*Participation in OLTA by type of activity and breadth of participation*

The high prevalence rates of sports participation, either team or individual disciplines, underline their prominent position among various types of OLTA. This was further highlighted by the results of cluster analysis that yielded two solely sport-focused patterns of OLTA involvement (see Chapter 4). A similar 'domination' of sport activities was also observed in the U.S. (Hansen et al., 2010; Zarrett et al., 2009) and Canada (McCabe et al., 2016). Furthermore, the uniqueness of sports has also been underpinned in numerous studies on OLTA that applied a 'simple' categorization between sports and non-sport activities (e.g. Forneris et al., 2015; Guevremont et al., 2014; McCabe et al., 2016; Zarrett et al., 2009). The least frequently reported OLTA type was religious activity, with only about 7% of Czech youth involved in church meetings or choirs. Such a rate is half or less than rates presented in studies from the U.S. (Salas-Wright et al., 2014; Smith et al., 2002) or Canada (Michaelson et al., 2014; Perks & Haan, 2011). Low involvement in religious/church activities fits in with the picture of the Czech Republic as one of the most atheist countries worldwide (Cribari-Neto & Souza, 2013; Hamplova & Nespor, 2009). Based on this, the popularity of some types of OLTA may be similar across different cultures, while for other activities it is very likely to be nation-specific, or more broadly, culturally determined.

The information on participation in six distinct OLTA categories allowed us to estimate the breadth of OLTA participation as a one of four key OLTA participation dimensions (Bohnert et al., 2010) described in more detail in the Introduction (Chapter 1). This was represented by the number of activity categories in which youth participated concurrently. Most Czech adolescents participated in one or two activities (with an average number of about 1.5), which is similar to what Zambon et al. (2010) observed in five other European countries. However, it is less than in studies from the U.S. or Canada, which consistently reported a higher average from around 1.9 (Neely & Vaquera, 2017) to over 2.6 (Fredricks, 2012), 2.7 (Busseri et al., 2006) or up to 3 (Sharp et al., 2015). Taking these rates into consideration, a rather low percentage of Czech adolescents (6%) indicated exceptionally broad participation in four or more OLTA, thus attenuating worries regarding the widespread 'overscheduling' of adolescents, in line with U.S. studies (Fredricks, 2012; Mahoney et al., 2006; Mahoney & Vest, 2012). Regardless, our finding also somewhat supports the conclusions that OLTA do not dominate adolescents' leisure time in terms of overall time spent on them. This also fits with previous research indicating that around 30-100 minutes a day in structured activities (Larson & Verma, 1999), or 6 hours a week (Mahoney et al., 2006), would be a probable approximation of weekly time spent when participating in one or two OLTA. To compare, daily screen-time in 30 countries from Europe and North America, as well as Israel was around 5-8 hours (Bucksch et al., 2016). This allows for an estimate

that, on average, adolescents spend roughly 5-7 times more time in front of a screen than in an organised setting.

### 8.2.2 Role of family environment in adolescents' participation in OLTA

We found that the odds for participation in OLTA also depend on a number of factors of adolescents' family environments, in addition to variations by gender and age. As presented in Chapter 3, several family environment factors were uniquely associated with higher odds for OLTA participation. In line with previous studies (Denault & Poulin, 2008; Fawcett et al., 2009; Martin et al., 2015; Simpkins et al., 2005; Simpkins et al., 2011), we found that adolescents who perceived their families to be highly supportive were more likely to participate in OLTA than those perceiving medium or low family support. Most parents wish their children to be healthy and happy and to become functional, competent adults (Dunn et al., 2003). The combination of OLTA and a good quality of familial relationships has indeed been shown to be linked to markedly lower rates of depression in clinical research (Mason et al., 2009). Moreover, parents feel their responsibility for their children to learn the skills needed to be successful in their adulthood (Dunn et al., 2003; Harrington, 2015). They identify the crucial ones as responsibility or commitment, teamwork, confidence and social skills and understand that leisure time, and particularly the OLTA context, provides a suitable space to practice these skills (Dunn et al., 2003; Harrington, 2015). Notably, there is a strong overlap between these parent-appreciated skills and the six Cs (competence, confidence, connection, character and caring, and contribution) of PYD, which are believed to be fostered in the OLTA context (Bowers et al., 2010; Lerner, 2005; Phelps et al., 2009). Parents seem to be aware of OLTA benefits, especially when they have participated themselves in OLTA when younger or are currently involved in OLTA as leaders (Dunn et al., 2003; Simpkins et al., 2011). Such parents then perhaps want to convey these benefits to their children, too. Therefore, it is likely that those who feel 'obliged to prepare' their children for their adult roles, apply parenting practices that include both emotional and other types of support and encourage their children to participate in OLTA. It also fits in the picture that 'good parenting practices' naturally include support for the participation of one's children in OLTA (Trussell & Shaw, 2012).

#### *Joint family activities as 'purposive leisure'*

Adolescents were also more likely to participate in OLTA when also involved at least weekly in joint family sports, going for walks or playing indoor games. In contrast, frequent TV watching with parents was associated with lower odds for OLTA participation. Unlike TV watching, the former three activities have in common that they also require parents to invest efforts (not only in means of physical activity but also in terms of a proactive attitude) in addition to investing their time. Shaw and Dawson (2001) explained the reasons for this 'engaged' style of parenting. They found that parents understand leisure as somewhat purposive time and appreciate options to transfer healthy habits and values to their children, in addition to being enjoyable, which is often an end by itself, and to strengthening family bonds (Harrington, 2015; Shaw & Dawson, 2001). This time investment in joint activities can be further amplified by parents' own involvement in OLTA, as leaders/coaches (Dunn et al., 2003) or participants themselves (Simpkins et al., 2005). This adds another feature to the portfolio of parenting practices assumed to promote the OLTA participation mentioned in the paragraph above. Interestingly, the promotion of OLTA participation might also, to a certain extent, be indirect or even unaware and happen simply by means of transfer of relevant values and beliefs to one's own children (Fawcett et al., 2009).

#### *Variations in the associations of family environment factors with participation in OLTA by gender and age*

We observed only one statistically significant interaction with gender and one with age for the associations of family environment factors with OLTA participation. These two could simply be due to chance, given the number of interactions tested (Chapter 3). In general, this indicates that family environment factors are consistently associated with adolescents' OLTA participation, independently of gender and age. Similarly, no gender variations were found in the relations of parents' behaviours – encouragement and modelling – and their children's OLTA participation (Simpkins et al., 2005). This is also in line with Persson et al. (2007), who showed that positive feelings regarding one's own family predicted a lower dropout from OLTA, regardless of adolescents' age. This might be particularly important from the point of view that adolescence is typified by exploration of one's own identity and

acquiring increased levels of independence from parents (Koepeke & Denissen, 2012). The OLTA context seems to provide suitable conditions facilitating parents' support and recognition of a youth's independent actions, which in turn cause adolescents to gain greater trust and autonomy (Larson et al., 2007) in this period of life characterised by rapid changes in parent-adolescent relationships. The above findings on selected family environment factors could give some clues about how parents might be able to counteract or postpone the general rise of non-participation in OLTA with increasing age (Chapter 4), which could in turn strengthen the relationship with their child later. Parental promotion of children's participation in OLTA throughout early to middle adolescence would be further desirable, since the associations with positive outcomes (Chapters 4-6), in general, do not seem to be age-dependent. In this thesis, OLTA participants reported better health- and school-related outcomes than non-participants at all age categories surveyed – 11, 13, as well as 15 years. Therefore, keeping them involved seems to be beneficial both for familial relationships and adolescents' healthy development.

#### *Role of socioeconomic status in the rates of participation in OLTA and related outcomes*

Finally, family socioeconomic status was found to affect neither the associations between OLTA participation and family environment factors (Chapter 3) nor the associations of OLTA with health- and school-related outcomes (Chapters 6 and 7). Participation in OLTA therefore appears to yield similar benefits and possibly be promoted by comparable means in children from wealthy families and in those at the opposite end of the social stratum. This, of course, holds true if the relationships with better school functioning and lower rates of risk behaviours are causal. Similar findings have also been previously reported in several U.S. studies. For instance, Wen (2008) found OLTA participation to be linked to health independently of family socioeconomic status in a large sample of over 20,000 families. Likewise, other positive developmental outcomes (e.g. psychological flourishing, educational attainment or civic engagement) were found to be predicted by OLTA participation regardless of family income (Mahoney & Vest, 2012). In addition, expected beneficial outcomes of OLTA participation were also reported to be applicable to marginalised or otherwise 'socially disadvantaged' youth, as observed, for example, among ethnic minorities in the U.S., i.e. Latinos (Fredricks & Simpkins, 2012), Afro-Americans (Mahoney et al., 2006), or Asian Americans (Camacho & Fuligni, 2015). This appears to be an important message, when taking into account that rates of OLTA participation significantly vary by the socioeconomic status (Holloway & Pimlott-Wilson, 2014; Weininger et al., 2015), family structure (Chesters & Smith, 2015; McMillan et al., 2016) or ethnic background (Yu et al., 2015) of adolescents. However, we must acknowledge that the Czech Republic is among countries with the lowest income inequality worldwide, as measured by the Gini index (OECD, 2016). Furthermore, its population is also very homogeneous in terms of nationalities, as only about 5% of inhabitants are of different origin than Czech (Czech Statistical Office, 2014). Thus, the role of adolescents' socioeconomic status in either rates of OLTA participation or its outcomes might largely differ in countries with more pronounced income disparities or more ethnically heterogeneous populations than that of the Czech Republic.

#### 8.2.3 Associations of OLTA with health- and school-related outcomes

In this thesis, adolescents' participation in OLTA was rather uniformly associated with enhanced health, better school functioning and lower occurrence of health-risk behaviours compared with non-participants (Chapters 4–6). Our findings are consistent with a large body of research that reported OLTA participants to perform better at school (Fredricks, 2012) and to have a stronger school bonding (Knifsend & Graham, 2012), lower rates of substance use (Takakura, 2015) and of norm-breaking behaviours (Mahoney & Stattin, 2000), better psychological adjustment (Fredricks & Eccles, 2006b), higher life satisfaction (Leversen et al., 2012) and better self-reported health (Zambon et al., 2010). From this point of view, the results support the hypothesis of the PYD theory that OLTA serve as a context that allows development of individual strengths, which in turn, leads to their thriving (Larson, 2000; Lerner, 2005; Mahoney et al., 2005). Such a wide range of assumed positive outcomes seemingly requires explanation using manifold potential mechanisms. Moreover, it implies that OLTA may fulfil numerous functions that leisure time is supposed to have (Opaschowski, 1976), as mentioned at the very beginning of the Introduction (section 1.1).

*OLTA and adolescents' physical and mental health*

Czech OLTA participants were significantly more likely to report excellent self-rated health and high levels of life satisfaction than non-participants (Chapter 4), which is in line with studies of Zamboni et al. (2010) and Levensen et al. (2012). This finding supports the notion of PYD theory that alignment of individual strengths with contextual assets supports thriving, which is a foundation for the 'sixth C' – contribution to family and civil society and, importantly, also to the self. In the PYD theory, contribution to the self is manifested by maintaining one's own health and ability, i.e. an individual is aware of being responsible for his/her own health and remains an active agent of his/her own development (Lerner, 2005). A complementary explanation may be that higher autonomy levels are linked to increased well-being and life satisfaction (Levensen et al., 2012; Wang et al., 2007). Moreover, participation in OLTA seems to increase leisure satisfaction and to fulfil needs of competence and relatedness (the equivalent of connection in the terminology of the PYD theory), which in turn leads to higher life satisfaction (Levensen et al., 2012; Sarriera et al., 2014).

Associations with less frequent occurrences of specific health complaints were less prominent but, when observed, indeed indicated that OLTA participants suffered less frequently from specific psychosomatic complications than non-participants. The findings of Chapter 4 thus underline the existence of an association between OLTA participation and enhanced health among adolescents. Nonetheless, it could also be just a consequence of 'self-selection factors'. In other words, it may be that only individuals who are both physically and mentally healthy enter OLTA, as suggested by Trainor et al. (2010). This requires further study.

*OLTA and adolescents' substance use*

Next, participation in OLTA was associated with lower rates of substance use (Chapter 5). As in the case of health above, this finding affirms the hypothesis of the PYD theory that healthy development, facilitated by involvement in OLTA, is linked to decreases in problem and risk behaviours (Lerner, 2005). OLTA participation, therefore, seems not only to promote positive behaviours and attitudes but also seems to complement them by preventing or reducing youths' engagement in negative and health-risk behaviours. Several other studies found that OLTA participants also engage less frequently in tobacco smoking, alcohol drinking or other illicit drug use than non-participants (Bohnert & Garber, 2007; Farb & Matjasko, 2012; Takakura, 2015). This can be explained in a number of ways. Some authors indicate that participation in OLTA might decrease motivation for engagement in substance use. Examples include a negation of the need to stabilise one's own social position through e.g. smoking by being a member of a certain club (Viau et al., 2015), or channelling stress-reduction efforts by time spent in OLTA (Darling, 2005). Moreover, time spent under supervision of influential adults (Bohnert & Garber, 2007) and positive identity-related experiences and goal-directed behaviours from OLTA participation are thought to be protective against health-risk behaviours (Palen & Coatsworth, 2007). Alternatively, the lower occurrence of substance use could be simply due to OLTA participants having less time available than non-participants to be spent in unstructured settings. These settings can serve as a context with an increased number of health-risk opportunities (Osgood et al., 2005; Weerman et al., 2015), making this restriction potentially protective. This latter explanation could, however, hold true only for a certain portion of adolescents.

In Chapter 7, we found a noteworthy group of respondents who were able to find time both for OLTA and UA and reported elevated rates of substance use, which is discussed in more detail in the section 8.2.5. Nonetheless, those involved only in OLTA and not in UA were slightly less likely to smoke regularly than those involved neither in OLTA nor in UA. Lower rates of drunkenness and potentially too early sexual experience did not significantly differ. In the end, this could mean that OLTA may, to a certain extent, act as an environment preventing adolescents from engaging in some specific health-risk behaviours (smoking in our case). In contrast, manipulating the OLTA environment seems to be an inefficient tool by itself for prevention of other health-risk behaviours (drunkenness and potentially risky sexual behaviours in our case).

*OLTA and adolescents' violent behaviours*

The rates of physical fighting and medically attended injuries were higher among participants in OLTA, in contrast to the lower rates of substance use. As sports were in general the most prevalent type of OLTA in our sample, it seems logical that OLTA participants were significantly more likely to get injured.



Sports are an environment in which injuries happen frequently (Maffulli et al., 2011; Mattila et al., 2004). Similarly, getting injured is undoubtedly more probable when crafting something or camping in woods than in case of, for instance, shopping or watching TV. Likewise, the findings concerning physical fighting are in line with some previous studies showing that OLTA participants, team athletes in particular, report higher rates of violent behaviours even outside of the sport settings (Garry & Morrissey, 2000; Kreager, 2007). Adolescents participating in OLTA put their time and effort into activities that they apparently value (Ross et al., 2013; Simpkins et al., 2012) and are intrinsically motivated to engage in them (Larson, 2000). Such immersion into an activity in combination with sports as an environment where conflict may arise regularly could lead to higher rates of physical fighting directly in the sport setting. Nonetheless, it also suggests that in our sample sports and the OLTA context, in general, were not functioning as an efficient outlet for aggression, in particular for boys. On the other hand, we were unable to determine whether the fights took place in a sports setting or elsewhere. This obviously makes a difference, because violent behaviour seems to be somewhat common in the sports environment and also more tolerable than in other settings (Fields et al., 2007). Nonetheless, the increased risk of physical fighting or injuries infers that some potential negative consequences of OLTA participation need to be considered, despite the assumed prevailing positive outcomes.

#### *OLTA and adolescents' school functioning*

The last set of outcomes that we assessed in relation to OLTA participation concerned school functioning (Chapter 6). We found that OLTA participants reported higher school engagement and school performance and less school-related stress than those who did not participate in any OLTA. Our results supported the findings of numerous preceding studies, which found OLTA participation to be predictive of better overall academic achievement, as indicated by grade point average (Camacho & Fuligni, 2015; Fredricks & Eccles, 2010; Knifsend & Graham, 2012), higher sense of belonging at school (Knifsend & Graham, 2012), educational status after graduating from high school (Fredricks, 2012) and reduced rates of school dropout (Mahoney & Cairns, 1997; Neely & Vaquera, 2017). Like the above findings, the present findings support the PYD theory, with its notion that OLTA participation facilitates the building of competence – one of the six Cs – conceptualised as a measure of various individual abilities, including academic abilities (Lerner, 2005). Skills developed in the OLTA context thus seem to be also transferable to the school context (Covay & Carbonaro, 2010), a principle which has also recently been suggested for adolescents' motivation (Denault & Guay, 2017). However, the principle could also be the reverse, i.e. youth who have more school-related skills are able to participate in OLTA more successfully and logically also more likely to attain their participation.

School performance was better in OLTA participants than in non-participants even after accounting for their involvement in UA (Chapter 7). This was not observed with regard, for instance, to drunkenness, with OLTA participants showing outcomes similar to non-participants, when not involved in UA. This could indicate that the nurturing of adolescents' strengths through the assets of the OLTA context might be especially beneficial concerning adolescents' school-related outcomes, while for other outcomes the avoidance of 'risky' unstructured settings might be more important.

#### *Variations in the associations of participation in OLTA with health- and school-related outcomes by gender and age*

In Chapters 4-6, we also tested whether the above associations were modified by adolescents' gender or age. Age, in general, did not modify the associations of OLTA participation and selected outcomes, apart from bullying and school support outside of family. This finding might be interpreted as meaning that youth may benefit from OLTA participation from early to middle adolescence (11-15 years). Regarding gender, no interaction effects were found either regarding health or school functioning for dichotomous OLTA participation, with only one consistent exception. We observed generally stronger associations with reduced engagement in health-risk behaviours among girls (Chapter 5). On the one hand, the fact that boys were more likely to get injured or fight when in OLTA is a similar pattern to that observed by Mattila and colleagues. They found that boys fight more frequently in their leisure-time activities (Mattila et al., 2005) and are at higher risk of getting injured (Mattila et al., 2004). On the other hand, this gender-dependent pattern is in contradiction with previous studies regarding substance use, in which boys were observed to be protected against smoking, alcohol or marijuana use to a further extent than girls (Fredricks & Eccles, 2006b; Metzger et al., 2011). To summarise, OLTA

participation, regardless of type of OLTA, breadth or pattern of participation, was consistently associated with multiple positive outcomes in the spheres of health, school functioning and risk behaviours, mostly also after accounting for gender and age factors. If causal, this implies that such participation is beneficial for most early to middle adolescents. Moreover, our findings also highlight the assumption that the alignment of adolescents' strengths with the developmental assets offered by the OLTA context promotes PYD, which is manifested in numerous positive features – the six Cs (Lerner, 2005).

#### 8.2.4 Differences in the associations with health- and school-related outcomes by pattern of OLTA participation

One of the aims of the present thesis was to assess whether the pattern of OLTA participation modifies the association of participation with specific outcomes (Chapters 4-6). In line with studies recommending the so-called 'person-oriented approach' (Farb & Matjasko, 2012; Ferrar et al., 2013; Linver et al., 2009), we conducted a cluster analysis (Chapter 4) to retrieve the most prevalent patterns of OLTA participation in Czech adolescents. We identified five clusters that showed acceptable intra-cluster similarity, as well as reasonable differences between the clusters. These five distinct clusters representing patterns of OLTA participation concerned: (a) *Team sports* (involved in only team sports); (b) *Individual sports* (all in individual sports and about half of them also in team sports); (c) *Artists* (all in arts and around 57% also in team and/or individual sports); (d) *All-rounders* (involved in all other combinations of OLTA, with the most notable characteristic being that over 85% of them participated in 2 or more OLTA at the same time); and (e) *Inactive* (not participating in any of the 6 OLTA types queried in the questionnaire). The existence of two purely sport-based clusters and the artists cluster further highlights the dominant positions of sports and arts as very common ways of spending leisure time among adolescents, as reported in section 8.2.1.

Members of all four clusters comprising actual OLTA participation had mostly better outcomes than the adolescents in the inactive cluster regarding all areas investigated in this thesis, the only exception being the associations between affiliation to team sports cluster and risk behaviours. However, the associations varied somewhat by specific pattern of OLTA participation, as expected. The most likely explanation is that different types of OLTA provide youth with distinct developmental experiences (Hansen et al., 2010; Larson et al., 2006). This extends the findings of the preceding section 8.2.3 that OLTA participation is linked to PYD and implies that mere participation is not the single factor behind the associations observed. The pattern of OLTA participation obviously matters, as indicated also by other researchers (Farb & Matjasko, 2012; Metzger et al., 2009; Zarrett et al., 2009).

##### *Differences in the associations with adolescents' health by pattern of OLTA participation*

The strongest associations with health outcomes (Chapter 4) were observed fairly consistently among adolescents in the team and individual sport clusters, i.e. those involved only in sports. Sports are linked to increased levels of physical activity (Biddle et al., 2011; Sallis et al., 2000; Van der Horst et al., 2007), which is convincingly associated with a plethora of health-promoting effects, with regard to both physical (Hallal et al., 2006) and mental health (Biddle & Asare, 2011). For this reason, we believe that the enhanced self-rated health and higher life satisfaction among participants only in sports might be to a certain extent ascribed to this physical activity. Adolescents who focus only on their sports perhaps devote more time to such sports participation than those combining sports with other types of OLTA, as did some members of the artist and all-rounder clusters. Moreover, many adolescents in the latter two clusters did not participate in sports at all. This could have further highlighted this difference, if physical activity was really a crucial factor behind the association of sports and health.

The finding that the strongest associations with health were found in those involved only in sports rather contradicts the premise that the more types of OLTA adolescents are involved in (i.e. higher breadth of participation), the better for their development regarding academic adjustment and substance use but also for the absence of depressive symptoms or chronic strain (Fredricks & Eccles, 2006b; Mahoney et al., 2006; Sharp et al., 2015). This is a rather unprecedented observation. In addition, it is also inconsistent with our findings on school functioning and risk behaviours (Chapters 5 and 6). With regard to the latter two sets of outcomes, we observed that artists and all-rounders generally reported the most favourable school functioning and lowest rates of risk behaviours in our sample, in contrast to health outcomes. This provides an additional indication that patterns of OLTA

participation actually matter for adolescents' developmental outcomes and, what is more, have unique associations with various outcomes.

The associations of sports participation with lower occurrence of psychosomatic health complaints were less consistent, i.e. they were more evident for team sports and generally missing for the remaining clusters. Based on this, one may also expect other underlying mechanisms to be in place, such as the previously mentioned satisfaction of needs for competence and relatedness (Leversen et al., 2012) or stabilisation of social position among peers (Viau et al., 2015). These mechanisms could lead theoretically to higher life satisfaction or absence of low or anxious moods especially among team sports participants who are on a squad.

#### *Differences in the associations with adolescents' risk behaviours and school functioning by pattern of OLTA participation*

Concerning substance use and other risk behaviours, the most consistent associations with reduced engagement in risk-taking were found for the cluster of artists (Chapter 5). The same was found for school functioning as an outcome. The artists had the highest school engagement and academic achievement as well as lowest levels of school-related stress (Chapter 6). Similarly, adolescents in the all-rounders cluster 'outperformed' both the sport-composed clusters with regard to school functioning and also had lower odds than the team sports cluster with regard to substance use. Significantly over half of adolescents in the artists and all-rounders clusters participated in more than one OLTA. Thus, the premise of 'the more, the better' (Fredricks & Eccles, 2006a; Mahoney et al., 2006; Sharp et al., 2015), as mentioned in the preceding sub-section, was supported regarding school functioning and health-risk behaviours. The art activities and the combination of different types of activities therefore seem to be beneficial, especially for improvement of school functioning and avoidance of health-risk behaviours.

Furthermore, regarding substance use we observed participants in only team sports to report rates that were very comparable to those in the inactive cluster, i.e. non-participants. This is important to be noted, as some previous studies indicated that sport participants might be engaged more in risky substance use, especially increased rates of overall alcohol use and binge drinking (Farb & Matjasko, 2012; Garry & Morrissey, 2000; Linver et al., 2009). Furthermore, these increased rates of substance use among sport participants reportedly persist even into younger adulthood (O'Brien et al., 2012; Veliz et al., 2017). For this reason, our finding showing no difference between those involved in team sports and non-participants might appear to be somewhat promising in the present sample. On the other hand, Czech adolescents report relatively high rates of regular alcohol consumption in a cross-national comparison (Inchley et al., 2016), which undermines the preceding proposition or at least shows the advantage to be limited. Alternatively, it could also be that being a member of a sport team is part of an underlying trait that includes health-risk behaviours, as previously indicated in a sample of Dutch adolescents (van Nieuwenhuijzen et al., 2009).

#### *Variations in the associations of patterns of OLTA with health- and school-related outcomes by gender and age*

We also assessed the interaction effects of gender and age for the associations of specific patterns of OLTA with health- and school-related outcomes, similarly to what we did regarding the dichotomous OLTA variable (at least one OLTA vs. no OLTA). In comparison with this dichotomous measure, we found no additional interactions of either age or gender with regard to school functioning and health-risk behaviours, although some of the interactions were observed only for specific clusters of OLTA participation and were not statistically significant for all four clusters comprising OLTA participants. The sole exception regarded the associations of clusters of sports and arts with health outcomes (Chapter 4). Boys seemed to 'profit' more from their sport participation, while arts appeared to be more 'beneficial' for girls and younger adolescents, which remained concealed with the dichotomous OLTA variable, as none of the gender- or age-related interactions was statistically significant. This finding is complementary to the general gender-determined rates of involvement in these two types of OLTA, with boys favouring sports and girls preferring art activities, as presented in Chapter 4 and further discussed in section 8.2.1. This could indicate that boys and girls naturally select activities that make them feel good, in addition to explanations given in Chapter 4 (gender differences in motivation for sports participation and acceptability of conflicts in sports). Yet, it should be noted that boys participating in arts and girls participating in team and/or individual sports did report better health

outcomes than their non-participating peers. Otherwise, if the interactions were observed, their direction and size were similar to the gender- or age-related pattern of interactions of the dichotomous OLTA variable (at least one OLTA vs. no OLTA). For example, 13-year-olds had relatively higher odds for having school support outside their family than 15-year-olds when involved in any OLTA. Analogically, 13-year-old members of the all-rounders, individual and team sports clusters were more likely to acquire such support than their 15-year-old peers in the same clusters. Thus, it seems that these interactions rather depended on demographic factors (gender or age) than on a particular pattern of OLTA involvement.

#### 8.2.5 OLTA as a potential 'buffering agent' for negative outcomes from unstructured activities

In Chapter 7 we also focused on involvement in what were assumed to be risky unstructured activities (UA), which were expected to be associated with unfavourable health- and school-related outcomes. We did so because some authors have been arguing for research on more comprehensive patterns of time use, including leisure pursuits other than OLTA, such as UA and social activities. They assumed this would better explain the role of leisure-time activities in adolescents' outcomes and development (Bartko & Eccles, 2003; Ferrar et al., 2013).

##### *Unstructured activities and adolescents' health-risk behaviours and school performance*

We observed that weekly involvement in three specific UA (hanging out, shopping for fun, and meeting friends after 8 p.m.) was associated with a significant increase in odds for regular smoking, drunkenness, experience with sexual intercourse and less favourable school performance. The same applied for our classification of general excessive involvement in UA, i.e. in any of the unstructured activities on a daily basis or in at least two such activities at least weekly. This was in line with numerous studies that reported activities of this sort to predict engagement in various antisocial behaviours (Augustyn & McGloin, 2013; Hoeben & Weerman, 2016) and to be associated with worse school performance (Bae & Wickrama, 2015; Nelson & Gastic, 2009) and increased rates of substance use (Gage et al., 2005; Kiesner et al., 2010; Pulver et al., 2015). Two mutually complementary explanations can be used here. First, UA attract adolescents who are generally more prone to risk behaviours (Mahoney et al., 2004), and the negative outcomes of UA can be a result of exposure to such peers (Haynie & Osgood, 2005; Hoeben & Weerman, 2016; Svensson & Oberwittler, 2010). Second, UA provide youth with opportunities to engage in risk behaviours (Haynie & Osgood, 2005; Hoeben & Weerman, 2016; Persson et al., 2007; Siennick & Osgood, 2012). This implies that UA-based risk-taking is mostly driven by situational motivation, i.e. the higher risk exposure occurs seemingly due to the nature of such activities.

Moreover, the associations of UA involvement with health-risk behaviours and school performance remained almost unchanged after adjustment for gender, age and socioeconomic status of adolescents' families. None of the gender-related interactions was statistically significant. We observed only an interaction effect of age on the association of involvement in UA with regular smoking; UA-involved older adolescents reported themselves to be regular smokers more frequently, than their younger counterparts engaged highly in such activities. Yet, excessive UA involvement was related to a higher risk of smoking in the entire sample. Our finding thus implies that UA can co-occur with health-risk behaviours and worse school performance for adolescents of both genders, independently of their age and socioeconomic status.

##### *The 'buffering effect' of participation in OLTA on the negative outcomes of involvement in unstructured activities*

Focusing on a broader picture of adolescents' leisure, we observed a noteworthy group of adolescents (roughly one in four adolescents in our sample) who were involved both in OLTA and in frequent UA. Similar findings showing that adolescents can combine both of these sorts of activities have already been reported in the past (Bartko & Eccles, 2003; Sharp et al., 2015). In this thesis, the adolescents involved in OLTA and UA concurrently had lower odds of smoking regularly and reporting recent drunkenness (not significantly, though) or potentially too early sexual intercourse than adolescents involved only in UA but not in OLTA. However, those involved neither in OLTA nor in UA did better on all these three risky outcomes than those combining OLTA and UA. Furthermore, we found that adolescents involved only in OLTA and not in UA had the best school performance and lowest odds for being regular smokers in comparison with all three remaining combinations of OLTA and UA

involvement. The odds for drunkenness and experience with sexual intercourse were comparable between these two groups, but still better than in those involved in UA, regardless of whether they participated in OLTA. Based on this, one can conclude that OLTA participation by itself might be insufficient to prevent some types of risk behaviours – drunkenness in this thesis – and that it is rather necessary to avoid UA involvement to efficiently prevent risk behaviours of this sort.

When assessing the ‘buffering effect’ of OLTA, the interactions between OLTA and UA on the associations with health-risk behaviours and school performance were not statistically significant, except for experience with sexual intercourse. This aligns with the inferences of some authors that the supposed effects of OLTA participation might be a bit overestimated (Fredricks & Eccles, 2006b; Larson, 2000), i.e. that the relationships with positive outcomes can actually be weaker than is generally assumed (Fredricks & Eccles, 2006b). Moreover, in conjunction with the findings in the preceding paragraph that both OLTA and UA seem to play their roles in adolescents’ health- and school-related behaviours, this advocates for studying more general patterns of leisure-time use. Such an approach could facilitate disentangling the associations with developmental outcomes, as it would provide a more comprehensive picture of how adolescents spend leisure time (Bartko & Eccles, 2003) and better reflect the reality of their lives.

No indications of a ‘buffering effect’ were observed regarding school performance, as there were only clear significant associations of OLTA participation with better school performance and vice versa for UA. The odds of interactions between OLTA and UA involvement were, however, somewhat consistent for health-risk behaviours, as they were all observed in the same direction. The odds for engagement in health-risk behaviours for those excessively involved in UA were relatively smaller in OLTA participants than in non-participants, however, without statistical significance for smoking and drunkenness. This gives some hints that OLTA participation might somewhat decrease the negative consequences of excessive UA involvement regarding health-risk behaviours. The lack of statistical significance of this buffering effect on substance use was, however, somewhat unexpected given the findings of other studies (Fredricks, 2012; Takakura, 2015; Zambon et al., 2010) and those reported in Chapter 5, i.e. OLTA participants being less likely to smoke regularly and get drunk recurrently. In summary, this thesis provides cues that such participation might be not as efficient in the prevention of substance use as it could be anticipated based on some previous findings (Fredricks, 2012; Takakura, 2015; Zambon et al., 2010). The risk of involvement in adverse health behaviours derived from UA involvement seems to be stronger than the assumed prevention effect of OLTA participation. On the other hand, general OLTA participation seems to be a suitable way to promote school performance among adolescents.

### 8.3 Strengths and limitations of the present thesis

This section contains information regarding the strengths and limitations of the present thesis that should be taken into account when interpreting our findings. It provides an overview of methodological considerations regarding the quality of our sample, of the information that we obtained and the potential causal interpretation of our findings.

#### 8.3.1 Quality of sample

We used a large nationally representative sample of 11-, 13-, and 15-years-old Czech adolescents, stratified by all 14 administrative regions and the ratio of primary and secondary schools (so-called gymnasiums). Furthermore, the response rates were exceptionally high at the school level, as well as at the individual level. The percentage of those who completed the 2013/2014 HBSC survey equalled to 6% of all adolescents enrolled in grades 5, 7, and 9 in primary schools, or the respective grades of gymnasiums (similar to the U.K. grammar schools or the U.S. junior/preparatory high schools) across the Czech Republic in the given school year (Czech Statistical Office, 2015). However, we did not include pupils from special schools i.e. those attended by pupils with special educational needs (approximately 3% of age-appropriate population – (Czech Statistical Office, 2015) or home-schooled adolescents (only 200 pupils in grades 5-9 in the whole Czech Republic in the given school year). Our findings can therefore be generalized to pupils enrolled in routine education in the Czech Republic.

### 8.3.2 Quality of information

The data for the present thesis comes from the 2013/2014 Czech HBSC study. HBSC member countries are obliged to comply with the international research protocol. This concerns stringent procedures of sampling, data collection and use of standardized international questionnaires, which need to be forward and backward-translated prior to each survey. The well-established methodological background of the international HBSC study (Currie et al., 2014; Roberts et al., 2009) can be considered as another strength of the present thesis.

In contrast, the use of self-reported data can be perceived as a limitation, as it may be affected by various forms of bias (recall bias, social desirability, etc.). Nonetheless, self-reported questionnaires are still the most feasible research instrument to be employed in large-scale studies, such as the HBSC. Moreover, as is evident from the use of the standardized questionnaire, most of the measures that we used in the thesis have been validated and have been shown to be suitable to validly investigate the respective phenomena and behaviours in studies of an epidemiological character (Bosakova et al., 2016; Currie et al., 2014). In addition, participation was voluntary, respondents were reassured about the anonymity of their reports, and data was collected in the absence of teachers, which should reduce the risk of information bias. Next, we obtained only data from adolescents' report and not from adolescents' teachers or parents. Such data triangulation could enrich our understanding of some findings, in particular regarding school functioning or the role of the family environment, where perceptions of youth and adults can differ substantially.

Lastly, our measure of overall OLTA participation can be considered to be somewhat crude, as it was measured by a dichotomous measure (yes/no) summarizing six particular OLTA categories. First, we might have omitted some specific categories of activities, such as membership of political organizations or volunteering. Participation in activities of this sort is, however, much less common throughout Europe than participation in the OLTA categories included or in comparison with North American countries (c.f. Zambon et al., 2010). In addition, we did not collect information regarding particular activity types. Developmental experiences and outcomes of a specific OLTA type might differ even within the same OLTA category. The particular sports discipline (e.g. American football vs. baseball) or type of art (performance vs. fine arts) were shown to be linked to adolescents' outcomes, such as aggressive behaviours, identity work and emotional regulation, in different ways (Agans & Geldhof, 2012; Hansen et al., 2010; Kreager, 2007). Therefore, the absence of such information could have led us to miss more nuanced variances in the associations. Similarly, we lacked information on the dimensions of participation other than its breadth (see Bohnert et al., 2010). These dimensions – intensity, engagement and duration – were shown to influence the associations of OLTA participation with adolescents' outcomes (Bohnert et al., 2010; Farb & Matjasko, 2012).

To somewhat reduce the influence of these interconnected limitations mentioned in the preceding paragraph, we used the so-called person-centred approach (cluster analysis) when investigating patterns of OLTA involvement and their associations with the outcomes. The pattern and closely related breadth have been suggested as the key factors of OLTA participation, as it allows identifying groups of participants as they actually occur in adolescent populations (Ferrar et al., 2013; Metzger et al., 2009; Zarrett et al., 2009). This may to a certain extent compensate for the lack of the information regarding other dimensions of OLTA participation. However, regarding the patterns of participation retrieved by cluster analysis, it is apparent that the category of all-rounders was very heterogeneous, unlike the other four clusters. This large within-cluster variation could have concealed some unique associations of other less prevalent patterns of OLTA participation comprising e.g. religious activities, scouts or other after-school clubs, and may thus have led to some underestimation or overestimation of the real effects.

### 8.3.3 Causality and confounding

Due to the cross-sectional design of the thesis it is not possible to draw any definite conclusions regarding the causality of our findings. However, several longitudinal studies from the U.S. (Eisman et al., 2017; Fredricks & Eccles, 2006b; Mahoney & Cairns, 1997) and Canada (Busseri et al., 2006; Denault et al., 2009) reported a predictive nature of OLTA participation on various outcome measures that was similar to ours. This allows us to anticipate the direction of the associations found in this thesis and their causality. Moreover, to our knowledge this is the first European study that systematically investigated potential effects of OLTA participation on multiple health- and school-related outcomes.

As such, this thesis is also the first that provides hints, although 'only' cross-sectional ones, that OLTA participation might yield effects on adolescents' developmental outcomes similar to those reported in the North American context.

Furthermore, adjustment for gender, age or socioeconomic status did not generally affect the associations, which indicates their relative robustness and the lack of major confounding by these key demographic factors. On the other hand, we did not control for some other potential confounders, such as stressful events, including parental divorce, that could have affected content of adolescents' leisure time as well as their health- and school-related outcomes. To conclude, we still cannot make any causal inferences with certainty. In the extreme case, it could even be that the causation was reverse due to various self-selection or predisposing factors (Eisman et al., 2016), e.g. only healthy individuals entered OLTA, while the others were unable to do so due to impaired health, low well-being (Trainor et al., 2010) or substance use impeding OLTA participation (Eisman et al., 2016).

Similarly, adolescents' risk behaviours tend to cluster together (van Nieuwenhuijzen et al., 2009). As UA have generally been shown to attract adolescents prone to such behaviours (Mahoney et al., 2004), it could be that involvement in UA and risk behaviours just form interconnected elements of an underlying personality trait. From this point of view, it seems that a longitudinal or, in particular, an experimental research design that would allow assessment of the sequence of the assumed exposure (start, end, increase, or increase of involvement in OLTA or UA) and effects (health- and school-related outcomes) could facilitate revealing the causality.

## 8.4 Implications for practice and policy, and for future research

This section on the implications of our findings is divided into two parts. The first part presents possible implications derived from the main findings of the thesis for adolescents and their parents and for relevant stakeholders in practice and policy (e.g. youth leaders/coaches, representatives of municipalities, or policy-makers). The second part regards implications for future research on OLTA participation and PYD.

### 8.4.1 Implications for practice and policy

Adolescent OLTA participants reported better health, school functioning and lower engagement in substance use than non-participants, with the latter being observed especially in girls. The remaining associations observed were, in general, independent of gender, age and socioeconomic status of adolescents' families. In line with the PYD theory, this indicates that OLTA participation deserves its place during adolescence and is assumed to promote thriving. From the opposite perspective, non-participants showed consistently less favourable outcomes. This implies that non-participation could serve as a certain indicator of an unhealthy lifestyle and that non-participants could be understood as a group of youth at-risk.

We showed a high overall rate of OLTA participation (around 80%), but this still means that roughly 20% of youth do not participate in any OLTA. Given the assumed positive outcomes, it could be advisable to seek opportunities that could promote their participation. Firstly, the reasons for their non-participation need to be discovered, as this should guide potential intervention efforts. Only then can suitable strategies be developed to promote participation or, from the opposite point of view, decrease the dropout rate. Similarly, activity leaders and parents should strive to maintain the participation of those already participating across adolescence, as the rates drop significantly with increasing age, while the assumed benefits seem to pertain from 11 to 15 years of age.

Based on previous research and the findings presented in this thesis, several parental actions seem to potentially prevent adolescents leaving OLTA. OLTA-related material/financial and emotional support, own involvement in leisure-time activities and intentionally affecting adolescents' OLTA-related cognitions could help to prevent dropout from OLTA (Bohnert et al., 2007; Larson et al., 2007; Simpkins et al., 2005). For OLTA leaders or coaches, it appears that creating an environment supportive of positive interpersonal relationships is linked to adolescents' long-term participation (Denault & Poulin, 2008). To achieve this and provide quality programs, leaders or coaches need to find a balance of pragmatic, organizational and other situational considerations with the developmental needs of adolescents (Larson & Walker, 2010). In other words, apart from the inherent goals of the given OLTA, leaders should also take interpersonal and psychological factors into account to sustain rates of OLTA participation.

In contrast to OLTA, peer-oriented unsupervised UA were strongly associated with substance use, experience with sexual intercourse and worse school performance. Therefore, discouraging youth from spending excessive time in 'risky' unstructured settings could help them avoid engagement in health-risk behaviours. One way to do so might be to provide youth with meaningful leisure-time opportunities, which has been shown to reduce rates of substance use, especially in girls (Motamedi et al., 2016). This could be a consequence of either promoting individual strengths by spending time in an OLTA context or of simply the avoidance of UA, because time is a finite resource. OLTA participation could thus serve for some youth as a way to limit time in which they experience boredom, which is linked to substance use (Weybright et al., 2015) and potentially risky sexual behaviour (Miller et al., 2014). This would be, to a certain extent, in line with the opinion that assumes that the effects of OLTA have been a bit overestimated (Fredricks & Eccles, 2006b; Larson, 2000).

We also observed that the associations of OLTA participation with health-risk behaviours and school-related outcomes remained almost unchanged after controlling for respondents' socioeconomic status. This indicates that the potential benefits, if the associations were causal, are applicable not only to those from well-off families but also to adolescents from economically disadvantaged families. This seems particularly important, given that the rates of OLTA participation differ substantially by parental income or education (Holloway & Pimlott-Wilson, 2014; Mahoney et al., 2006; Weininger et al., 2015). Moreover, in Chapter 6 we reported that OLTA participants are more likely to acquire support for their schoolwork outside their family. Therefore, it would be reasonable to provide as many low-cost leisure alternatives as is feasible, because our findings give some cues that OLTA participation has a potential for closing the social gap (Morris, 2015), or at least for preventing its further widening.

Despite the popular opinion that OLTA and particularly sports may serve as an efficient outlet for aggression and thus reduce violent behaviours, our findings do not support this in full. In line with other studies (Kreager, 2007; Mattila et al., 2005), we observed that the OLTA participants fight more often than non-participants. It could be that OLTA participants would be engaged in violent behaviours at even higher rates, if they did not participate in OLTA or that their fights take place mostly in OLTA directly and not in other settings (school, streets, etc.). This, however, is not possible to determine with our cross-sectional data. To conclude, this finding suggests that other strategies to counter this negative phenomenon should also be considered, although it could also differ by specific sports discipline and the findings could vary between, for instance, soccer and rugby.

#### 8.4.2 Implications for future research

One of the key motivations for writing this thesis was that data from Europe on the OLTA topic were generally very scarce. We used a large sample representative of the Czech Republic to fill this 'geographical' research gap; however, we suggest some replication studies also from different European countries or ideally in a cross-national perspective. As evident from the HBSC study, there are significant variations in a range of health indicators and behaviours across European countries (Inchley et al., 2016). Some findings are likely to be very comparable throughout Europe, such as higher rates of OLTA participation than non-participation (Zambon et al., 2010). Nevertheless, one could expect differences in specific activity types (the 'country-specific' popularity of various sport disciplines, unique youth organizations, or different level of religiosity across the country), which could affect both the patterns of OLTA participation and related outcomes.

Future research using European data should also strive to reveal the causality of the associations observed. This could be done using longitudinal or experimental research designs that would enable the capturing of changes in individuals' health- and school-related outcomes after getting involved in OLTA or oppositely quitting such involvement.

As noted in the Strengths and limitations section (8.3), we did not collect information regarding three important dimensions of OLTA participation. The participation dimensions have been repeatedly shown to affect the associations of OLTA participation with various developmental outcomes (Bohnert et al., 2010; Farb & Matjasko, 2012). We would therefore recommend that future research focus on intensity/frequency, duration and/or engagement of OLTA participation, which is likely to somewhat refine the findings presented in this thesis.

We also concentrated on adolescents' involvement in UA as a conceptually opposite way of spending their leisure time in OLTA. Youth involved in risky UA reported significantly higher rates of substance use, regardless of whether they took part in OLTA or not, although those who were involved



only in OLTA showed the highest rates of risk-taking. This supports the opinion that general patterns of leisure-time use might provide a more comprehensive picture of adolescents' lives. For this reason, we would suggest that future research also include other common leisure pursuits, such as sedentary or screen-time behaviours, which could further deeper understanding of links between leisure time and developmental outcomes in adolescence.

Around 80% of adolescents in our sample participated in at least one OLTA. We acknowledge that the rate of participation was quite high; however, there was still roughly one in five who did not participate. Therefore, we believe it would be worth assessing the reasons or barriers for non-participation in those 20% of youth to discriminate whether it is, for instance, due to financial constraints, lack of youth-appealing activities, low-quality facilities in proximity or, oppositely, a lack of general interest. Such data would provide valuable cues about whether OLTA dropout can be avoided or OLTA participation further promoted, which could be of use for policy-makers or funding agencies at the national, regional and, most importantly, the municipal level.

Finally, the findings reported in Chapter 7 on concurrent involvement in OLTA and UA support the notion that it is desirable to study more general patterns of time use (Bartko & Eccles, 2003) that perhaps reflect the reality of adolescents' everyday lives better than individual behaviours, such as OLTA participation by itself. Identifying such patterns of leisure-time use could then be used to recognise actual at-risk groups of youth. Possessing such information could be of help concerning development and implementation of efficient tailor-made interventions to prevent health-risk behaviours or boost school performance.

## 8.5 Conclusions

Around 80% of Czech adolescents took part in at least one OLTA. Team sports were the most prevalent OLTA among boys, while girls preferred arts. The rates of participation were higher among adolescents whose parents were supportive of them, engaged in several joint activities with their children and restricted their screen time. OLTA participants were more likely to report enhanced physical and mental health, better school functioning and lower levels of substance use than non-participants. The associations mostly held for both genders across all age categories (11, 13, and 15 years) surveyed, even after adjustment for socioeconomic status. However, they varied somewhat by pattern of OLTA participation, with adolescents involved only in sports reporting the best health, while those involved in arts (either alone or in combination with sports) having the highest odds for better school functioning and the lowest odds for substance use. Regarding UA, we found that adolescents involved in risky peer-oriented and unsupervised UA at least weekly had higher rates of health-risk behaviours and worse school performance than those who were uninvolved in such UA. In the case of substance use, this held true also for adolescents concurrently participating in OLTA, which means that risk inherent to such UA appeared to be stronger than the potential protective role of OLTA.

Overall, our findings indicate that OLTA represent a suitable context for healthy youth development but also that more comprehensive patterns of leisure-time use might yield a more precise picture of adolescents' health-related behaviours and related outcomes. Interventions aiming at a reduction of substance use or promoting school performance should consider the role of adolescents' leisure time.

## References

- Agans, J. P., & Geldhof, G. J. (2012). Trajectories of participation in athletics and positive youth development: The influence of sport type. *Applied Developmental Science, 16*(3), 151-165. doi:10.1080/10888691.2012.697792
- Agans, J. P., Champine, R. B., DeSouza, L. M., Mueller, M. K., Johnson, S. K., & Lerner, R. M. (2014). Activity involvement as an ecological asset: Profiles of participation and youth outcomes. *Journal of Youth and Adolescence, 43*(6), 919-932. doi:10.1007/s10964-014-0091-1
- Andreasen, N. C., & Glick, I. D. (1988). Bipolar affective-disorder and creativity - Implications and clinical management. *Comprehensive Psychiatry, 29*(3), 207-217. doi:10.1016/0010-440x(88)90044-2
- Appleton, J. J., Christenson, S. L., & Furlong, M. J. (2008). Student engagement with school: Critical conceptual and methodological issues of the construct. *Psychology in the Schools, 45*(5), 369-386. doi:10.1002/pits.20303
- Arbeit, M. R., Johnson, S. K., Champine, R. B., Greenman, K. N., Lerner, J. V., & Lerner, R. M. (2014). Profiles of problematic behaviors across adolescence: covariations with indicators of positive youth development. *Journal of Youth and Adolescence, 43*(6), 971-990. doi:10.1007/s10964-014-0092-0
- Augustyn, M. B., & McGloin, J. M. (2013). The risk of informal socializing with peers: Considering gender differences across predatory delinquency and substance use. *Justice Quarterly, 30*(1), 117-143. doi:10.1080/07418825.2011.597417
- Badura, P., Geckova, A. M., Sigmundova, D., van Dijk, J. P., & Reijneveld, S. A. (2015). When children play, they feel better: Organized activity participation and health in adolescents. *BMC Public Health, 15*(1090). doi:10.1186/s12889-015-2427-5
- Badura, P., Sigmund, E., Madarasova Geckova, A., Sigmundova, D., Sirucek, J., van Dijk, J. P., & Reijneveld, S. A. (2016). Is participation in organized leisure-time activities associated with school performance in adolescence? *Plos One, 11*(4), e153276. doi:10.1371/journal.pone.0153276
- Badura, P., Sigmundova, D., Sigmund, E., Madarasova Geckova, A., Van Dijk, J. P., & Reijneveld, S. A. (2017). Participation in organized leisure-time activities and risk behaviors in Czech adolescents. *International Journal of Public Health, 62*(3), 387-396. doi:10.1007/s00038-016-0930-9
- Bae, D., & Wickrama, K. A. S. (2015). Family socioeconomic status and academic achievement among Korean adolescents: Linking mechanisms of family processes and adolescents' time use. *Journal of Early Adolescence, 35*(7), 1014-1038. doi:10.1177/0272431614549627
- Barnes, G. M., Hoffman, J. H., Welte, J. W., Farrell, M. P., & Dintcheff, B. A. (2007). Adolescents' time use: Effects on substance use, delinquency and sexual activity. *Journal of Youth and Adolescence, 36*(5), 697-710. doi:10.1007/s10964-006-9075-0
- Bartko, W. T., & Eccles, J. S. (2003). Adolescent participation in structured and unstructured activities: A person-oriented analysis. *Journal of Youth and Adolescence, 32*(4), 233-241. doi:10.1023/a:1023056425648
- Beal, S. J., & Crockett, L. J. (2010). Adolescents' occupational and educational aspirations and expectations: Links to high school activities and adult educational attainment. *Developmental Psychology, 46*(1), 258-265. doi:10.1037/a0017416
- Biddle, S. J. H., & Asare, M. (2011). Physical activity and mental health in children and adolescents: a review of reviews. *British Journal of Sports Medicine, 45*(11), 886-895. doi:10.1136/bjsports-2011-090185
- Biddle, S. J. H., Atkin, A. J., Cavill, N., & Foster, C. (2011). Correlates of physical activity in youth: a review of quantitative systematic reviews. *International Review of Sport and Exercise Psychology, 4*(1), 25-49. doi:10.1080/1750984x.2010.548528
- Blomfield, C. J., & Barber, B. L. (2011). Developmental experiences during extracurricular activities and Australian adolescents' self-concept: Particularly important for youth from disadvantaged schools. *Journal of Youth and Adolescence, 40*(5), 582-594. doi:10.1007/s10964-010-9563-0
- Bohnert, A., Fredricks, J., & Randall, E. (2010). Capturing unique dimensions of youth organized activity involvement: Theoretical and methodological considerations. *Review of Educational Research, 80*(4), 576-610. doi:10.3102/0034654310364533
- Bohnert, A. M., & Garber, J. (2007). Prospective relations between organized activity participation and psychopathology during adolescence. *Journal of Abnormal Child Psychology, 35*(6), 1021-1033. doi:10.1007/s10802-007-9152-1
- Bohnert, A. M., Martin, N. C., & Garber, J. (2007). Predicting adolescents' organized activity involvement: The role of maternal depression history, family relationship quality, and adolescent cognitions. *Journal of Research on Adolescence, 17*(1), 221-243. doi:10.1111/j.1532-7795.2007.00520.x
- Boniell-Nissim, M., Tabak, I., Mazur, J., Borraccino, A., Brooks, F., Gommans, R., . . . Finne, E. (2015). Supportive communication with parents moderates the negative effects of electronic media use on life satisfaction

- during adolescence. *International Journal of Public Health*, 60(2), 189-198. doi:10.1007/s00038-014-0636-9
- Bosakova, L., Kolarcik, P., Bobakova, D., Sulcova, M., Van Dijk, J. P., Reijneveld, S. A., & Geckova, A. M. (2016). Test-retest reliability of the scale of participation in organized activities among adolescents in the Czech Republic and Slovakia. *International Journal of Public Health*, 61(3), 329-336. doi:10.1007/s00038-015-0749-9
- Bowers, E. P., Geldhof, G. J., Johnson, S. K., Lerner, J. V., & Lerner, R. M. (2014). Special issue introduction: thriving across the adolescent years: A view of the issues. *Journal of Youth and Adolescence*, 43(6), 859-868. doi:10.1007/s10964-014-0117-8
- Bowers, E. P., Li, Y. B., Kiely, M. K., Brittan, A., Lerner, J. V., & Lerner, R. M. (2010). The five Cs model of Positive Youth Development: A longitudinal analysis of confirmatory factor structure and measurement invariance. *Journal of Youth and Adolescence*, 39(7), 720-735. doi:10.1007/s10964-010-9530-9
- Boyce, W., Torsheim, T., Currie, C., & Zambon, A. (2006). The family affluence scale as a measure of national wealth: Validation of an adolescent self-report measure. *Social Indicators Research*, 78(3), 473-487. doi:10.1007/s11205-005-1607-6
- Bradley, B. J., & Greene, A. C. (2013). Do health and education agencies in the United States share responsibility for academic achievement and health? A review of 25 years of evidence about the relationship of adolescents' academic achievement and health behaviors. *Journal of Adolescent Health*, 52(5), 523-532. doi:10.1016/j.jadohealth.2013.01.008
- Bradley, G. L. (2010). Skate parks as a context for adolescent development. *Journal of Adolescent Research*, 25(2), 288-323. doi:10.1177/0743558409357236
- Bradley, G. L., & Inglis, B. C. (2012). Adolescent leisure dimensions, psychosocial adjustment, and gender effects. *Journal of Adolescence*, 35(5), 1167-1176. doi:10.1016/j.adolescence.2012.03.006
- Brady, S. S., Song, A. V., & Halpern-Felsher, B. L. (2008). Adolescents report both positive and negative consequences of experimentation with cigarette use. *Preventive Medicine*, 46(6), 585-590. doi:10.1016/j.ypmed.2008.01.019
- Brindova, D., Pavelka, J., Sevcikova, A., Zezula, I., van Dijk, J. P., Reijneveld, S. A., & Madarasova Geckova, A. (2014). How parents can affect excessive spending of time on screen-based activities. *BMC Public Health*, 14. doi:10.1186/1471-2458-14-1261
- Brindova, D., Veselska, Z. D., Klein, D., Hamrik, Z., Sigmundova, D., van Dijk, J. P., . . . Geckova, A. M. (2015). Is the association between screen-based behaviour and health complaints among adolescents moderated by physical activity? *International Journal of Public Health*, 60(2), 139-145. doi:10.1007/s00038-014-0627-x
- Bucksch, J., Sigmundova, D., Hamrik, Z., Troped, P. J., Melkevik, O., Ahluwalia, N., . . . Inchley, J. (2016). International trends in adolescent screen-time behaviors from 2002 to 2010. *Journal of Adolescent Health*, 58(4), 417-425. doi:10.1016/j.jadohealth.2015.11.014
- Bungay, H., & Vella-Burrows, T. (2013). The effects of participating in creative activities on the health and well-being of children and young people: A rapid review of the literature. *Perspectives in Public Health*, 133(1), 44-52. doi:10.1177/1757913912466946
- Busseri, M. A., & Rose-Krasnor, L. (2009). Breadth and intensity: Salient, separable, and developmentally significant dimensions of structured youth activity involvement. *British Journal of Developmental Psychology*, 27, 907-933. doi:10.1348/026151008x397017
- Busseri, M. A., Rose-Krasnor, L., Willoughby, T., & Chalmers, H. (2006). A longitudinal examination of breadth and intensity of youth activity involvement and successful development. *Developmental Psychology*, 42(6), 1313-1326. doi:10.1037/0012-1649.42.6.1313
- Cabane, C., Hille, A., & Lechner, M. (2016). Mozart or Pele? The effects of adolescents' participation in music and sports. *Labour Economics*, 41, 90-103. doi:10.1016/j.labeco.2016.05.012
- Caldwell, L. L., & Faulk, M. (2013). Adolescent leisure from a developmental and prevention perspective. In T. Freire (Ed.), *Positive Leisure Science: From Subjective Experience to Social Contexts* (pp. 41-60). Dordrecht: Springer Netherlands.
- Camacho, D. E., & Fuligni, A. J. (2015). Extracurricular participation among adolescents from immigrant families. *Journal of Youth and Adolescence*, 44(6), 1251-1262. doi:10.1007/s10964-014-0105-z
- Cantril, H. (1965). *The pattern of human concerns*. New Brunswick: Rutgers University Press.
- Carver, A., Timperio, A., Hesketh, K., & Crawford, D. (2010). Are children and adolescents less active if parents restrict their physical activity and active transport due to perceived risk? *Social Science & Medicine*, 70(11), 1799-1805. doi:10.1016/j.socscimed.2010.02.010
- Cook, E. C., Pflieger, J. C., Connell, A. M., & Connell, C. M. (2015). Do specific transitional patterns of antisocial behavior during adolescence increase risk for problems in young adulthood? *Journal of Abnormal Child Psychology*, 43(1), 95-106. doi:10.1007/s10802-014-9880-y
- Cote, J. (1999). The influence of the family in the development of talent in sport. *Sport Psychologist*, 13(4), 395-417.

- Covay, E., & Carbonaro, W. (2010). After the bell: Participation in extracurricular activities, classroom behavior, and academic achievement. *Sociology of Education*, *83*(1), 20-45. doi:10.1177/0038040709356565
- Crean, H. F. (2012). Youth activity involvement, neighborhood adult support, individual decision making skills, and early adolescent delinquent behaviors: Testing a conceptual model. *Journal of Applied Developmental Psychology*, *33*(4), 175-188. doi:10.1016/j.appdev.2012.04.003
- Cribari-Neto, F., & Souza, T. C. (2013). Religious belief and intelligence: Worldwide evidence. *Intelligence*, *41*(5), 482-489. doi:10.1016/j.intell.2013.06.011
- Csikszentmihalyi, M. (1990). *Flow: The psychology of optimal experience*. New York: Harper & Row.
- Currie, C., Inchley, J., Molcho, M., Lenzi, M., Veselska, Z., & Wild, F. (Eds.). (2014). *Health Behaviour in School-aged Children (HBSC) study protocol: Background, methodology and mandatory items for the 2013/2014 survey*. St. Andrews: Cahru.
- Currie, C., Molcho, M., Boyce, W., Holstein, B., Torsheim, T., & Richter, M. (2008). Researching health inequalities in adolescents: The development of the Health Behaviour in School-Aged Children (HBSC) Family Affluence Scale. *Social Science & Medicine*, *66*(6), 1429-1436. doi:10.1016/j.socscimed.2007.11.024
- Currie, C., Zanotti, C., Morgan, A., Currie, D., de Looze, M., Roberts, C., . . . Barnekow, V. (Eds.). (2012). *Social determinants of health and well-being among young people. Health Behaviour in School-aged Children (HBSC) study: International report from the 2009/10 survey*. Copenhagen: WHO Regional Office for Europe.
- Czech Statistical Office (2014). *Czech Republic in Figures – 2014*. Retrieved on 15 May, 2017 from <https://www.czso.cz/csu/czso/czech-republic-in-figures-2014-ttm62hnpj6>
- Czech Statistical Office (2015). *Školy a školská zařízení*. Retrieved on 15 May, 2017 from <https://www.czso.cz/csu/czso/skoly-a-skolska-zarizeni-20132014-7e7y5p2ggw>
- Darling, N. (2005). Participation in extracurricular activities and adolescent adjustment: Cross-sectional and longitudinal findings. *Journal of Youth and Adolescence*, *34*(5), 493-505. doi:10.1007/s10964-005-7266-8
- Darling, N., Caldwell, L. L., & Smith, R. (2005). Participation in school-based extracurricular activities and adolescent adjustment. *Journal of Leisure Research*, *37*(1), 51-76.
- Deary, I. J., Taylor, M. D., Hart, C. L., Wilson, V., Smith, G. D., Blane, D., & Starr, J. M. (2005). Intergenerational social mobility and mid-life status attainment: Influences of childhood intelligence, childhood social factors, and education. *Intelligence*, *33*(5), 455-472. doi:10.1016/j.intell.2005.06.003
- Denault, A. S., & Guay, F. (2017). Motivation towards extracurricular activities and motivation at school: A test of the generalization effect hypothesis. *Journal of Adolescence*, *54*, 94-103. doi:10.1016/j.adolescence.2016.11.013
- Denault, A. S., & Poulin, F. (2008). Associations between interpersonal relationships in organized leisure activities and youth adjustment. *Journal of Early Adolescence*, *28*(4), 477-502. doi:10.1177/0272431608317607
- Denault, A. S., & Poulin, F. (2009). Intensity and breadth of participation in organized activities during the adolescent years: Multiple associations with youth outcomes. *Journal of Youth and Adolescence*, *38*(9), 1199-1213. doi:10.1007/s10964-009-9437-5
- Denault, A. S., & Poulin, F. (2016). What adolescents experience in organized activities: Profiles of individual and social experiences. *Journal of Applied Developmental Psychology*, *42*, 40-48. doi:10.1016/j.appdev.2015.11.004
- Denault, A. S., Poulin, F., & Pedersen, S. (2009). Intensity of participation in organized youth activities during the high school years: Longitudinal associations with adjustment. *Applied Developmental Science*, *13*(2), 74-87. doi:10.1080/10888690902801459
- Domazet, S. L., Tarp, J., Huang, T., Gejl, A. K., Andersen, L. B., Froberg, K., & Bugge, A. (2016). Associations of physical activity, sports participation and active commuting on mathematic performance and inhibitory control in adolescents. *Plos One*, *11*(1). doi:10.1371/journal.pone.0146319
- Dotterer, A. M., McHale, S. M., & Crouter, A. C. (2007). Implications of out-of-school activities for school engagement in African American adolescents. *Journal of Youth and Adolescence*, *36*(4), 391-401. doi:10.1007/s10964-006-9161-3
- Dunn, J. S., Kinney, D. A., & Hofferth, S. L. (2003). Parental ideologies and children's after-school activities. *American Behavioral Scientist*, *46*(10), 1359-1386. doi:10.1177/0002764203251477
- Dworkin, J. B., Larson, R., & Hansen, D. (2003). Adolescents' accounts of growth experiences in youth activities. *Journal of Youth and Adolescence*, *32*(1), 17-26. doi:10.1023/a:1021076222321
- Eccles, J. S., & Barber, B. L. (1999). Student council, volunteering, basketball, or marching band: What kind of extracurricular involvement matters? *Journal of Adolescent Research*, *14*(1), 10-43. doi:10.1177/0743558499141003
- Eccles, J. S., Barber, B. L., Stone, M., & Hunt, J. (2003). Extracurricular activities and adolescent development. *Journal of Social Issues*, *59*(4), 865-889. doi:10.1046/j.0022-4537.2003.00095.x
- Eccles, J. S., & Roeser, R. W. (2011). Schools as developmental contexts during adolescence. *Journal of Research on Adolescence*, *21*(1), 225-241. doi:10.1111/j.1532-7795.2010.00725.x

- Eisman, A. B., Stoddard, S. A., Bauermeister, J. A., Caldwell, C. H., & Zimmerman, M. A. (2016). Trajectories of organized activity participation among urban adolescents: An analysis of predisposing factors. *Journal of Youth and Adolescence*, *45*(1), 225-238. doi:10.1007/s10964-015-0267-3
- Eisman, A. B., Stoddard, S. A., Bauermeister, J. A., Caldwell, C. H., & Zimmerman, M. A. (2017). Trajectories of organized activity participation among urban adolescents: Associations with young adult outcomes. *Journal of Community Psychology*, *45*(4), 513-527. doi:10.1002/jcop.21863
- Elgar, F. J., Gariépy, G., Torsheim, T., & Currie, C. (2017). Early-life income inequality and adolescent health and well-being. *Social Science & Medicine*, *174*, 197-208. doi:http://dx.doi.org/10.1016/j.socscimed.2016.10.014
- Elgar, F. J., Pfoertner, T.-K., Moor, I., De Clercq, B., Stevens, G. W. J. M., & Currie, C. (2015). Socioeconomic inequalities in adolescent health 2002-2010: a time-series analysis of 34 countries participating in the Health Behaviour in School-aged Children study. *Lancet*, *385*(9982), 2088-2095. doi:10.1016/s0140-6736(14)61460-4
- Esteban-Cornejo, I., Hallal, P. C., Mielke, G. I., Menezes, A. M. B., Goncalves, H., Wehrmeister, F., . . . Rombaldi, A. J. (2015). Physical activity throughout adolescence and cognitive performance at 18 years of age. *Medicine and Science in Sports and Exercise*, *47*(12), 2552-2557. doi:10.1249/mss.0000000000000706
- Farb, A. F., & Matjasko, J. L. (2012). Recent advances in research on school-based extracurricular activities and adolescent development. *Developmental Review*, *32*(1), 1-48. doi:10.1016/j.dr.2011.10.001
- Fawcett, L. M., Garton, A. F., & Dandy, J. (2009). Role of motivation, self-efficacy and parent support in adolescent structured leisure activity participation. *Australian Journal of Psychology*, *61*(3), 175-182. doi:10.1080/00049530802326792
- Felder-Puig, R., Griebler, R., Samdal, O., King, M. A., Freeman, J., & Duer, W. (2012). Does the school performance variable used in the international Health Behavior in School-Aged Children (HBSC) study reflect students' school grades? *Journal of School Health*, *82*(9), 404-409. doi:10.1111/j.1746-1561.2012.00715.x
- Ferrar, K., Chang, C., Li, M., & Olds, T. S. (2013). Adolescent time use clusters: A systematic review. *Journal of Adolescent Health*, *52*(3), 259-270. doi:10.1016/j.jadohealth.2012.06.015
- Fields, S. K., Collins, C. L., & Comstock, R. D. (2007). Conflict on the courts - A review of sports-related violence literature. *Trauma Violence & Abuse*, *8*(4), 359-369. doi:10.1177/1524838007307293
- Fischer, N., & Theis, D. (2014). Extracurricular participation and the development of school attachment and learning goal orientation: The impact of school quality. *Developmental Psychology*, *50*(6), 1788-1793. doi:10.1037/a0036705
- Fleming, C. B., Catalano, R. F., Mazza, J. J., Brown, E. C., Haggerty, K. P., & Harachi, T. W. (2008). After-school activities, misbehavior in school, and delinquency from the end of elementary school through the beginning of high school. *Journal of Early Adolescence*, *28*(2), 277-303. doi:10.1177/0272431607313589
- Forneris, T., Camire, M., & Williamson, R. (2015). Extracurricular activity participation and the acquisition of developmental assets: Differences between involved and noninvolved Canadian high school students. *Applied Developmental Science*, *19*(1), 47-55. doi:10.1080/10888691.2014.980580
- Fredricks, J. A. (2012). Extracurricular participation and academic outcomes: Testing the over-scheduling hypothesis. *Journal of Youth and Adolescence*, *41*(3), 295-306. doi:10.1007/s10964-011-9704-0
- Fredricks, J. A., & Eccles, J. S. (2006a). Extracurricular involvement and adolescent adjustment: Impact of duration, number of activities, and breadth of participation. *Applied Developmental Science*, *10*(3), 132-146. doi:10.1207/s1532480xads1003\_3
- Fredricks, J. A., & Eccles, J. S. (2006b). Is extracurricular participation associated with beneficial outcomes? Concurrent and longitudinal relations. *Developmental Psychology*, *42*(4), 698-713. doi:10.1037/0012-1649.42.4.698
- Fredricks, J. A., & Eccles, J. S. (2008). Participation in extracurricular activities in the middle school years: Are there developmental benefits for African American and European American youth? *Journal of Youth and Adolescence*, *37*(9), 1029-1043. doi:10.1007/s10964-008-9309-4
- Fredricks, J. A., & Eccles, J. S. (2010). Breadth of extracurricular participation and adolescent adjustment among African-American and European-American youth. *Journal of Research on Adolescence*, *20*(2), 307-333. doi:10.1111/j.1532-7795.2009.00627.x
- Fredricks, J. A., & Simpkins, S. D. (2012). Promoting positive youth development through organized after-school activities: Taking a closer look at participation of ethnic minority youth. *Child Development Perspectives*, *6*(3), 280-287. doi:10.1111/j.1750-8606.2011.00206.x
- Gaetz, M. B., & Iverson, G. L. (2009). Sex differences in self-reported symptoms after aerobic exercise in non-injured athletes: implications for concussion management programmes. *British Journal of Sports Medicine*, *43*(7), 508-513. doi:10.1136/bjism.2008.051748
- Gage, J. C., Overpeck, M. D., Nansel, T. R., & Kogan, M. D. (2005). Peer activity in the evenings and participation in aggressive and problem behaviors. *Journal of Adolescent Health*, *37*(6), 517.e7-517.e14. doi:10.1016/j.jadohealth.2004.12.012

- Gardner, M., Roth, J., & Brooks-Gunn, J. (2008). Adolescents' participation in organized activities and developmental success 2 and 8 years after high school: Do sponsorship, duration, and intensity matter? *Developmental Psychology, 44*(3), 814-830. doi:10.1037/0012-1649.44.3.814
- Garlick, S. (2004). Distinctly feminine: On the relationship between men and art. *Berkeley Journal of Sociology, 48*, 108-125.
- Garry, J. P., & Morrissey, S. L. (2000). Team sports participation and risk-taking behaviors among a biracial middle school population. *Clinical Journal of Sport Medicine, 10*(3), 185-190. doi:10.1097/00042752-200007000-00006
- Geldhof, G. J., Bowers, E. P., & Lerner, R. M. (2013). Special section introduction: Thriving in context: Findings from the 4-H study of positive youth development. *Journal of Youth and Adolescence, 42*(1), 1-5. doi:10.1007/s10964-012-9855-7
- Gibbs, B. G., Erickson, L. D., Dufur, M. J., & Miles, A. (2015). Extracurricular associations and college enrollment. *Social Science Research, 50*, 367-381. doi:10.1016/j.ssresearch.2014.08.013
- Gifford-Smith, M. E., & Brownell, C. A. (2003). Childhood peer relationships: social acceptance, friendships, and peer networks. *Journal of School Psychology, 41*(4), 235-284. doi:10.1016/s0022-4405(03)00048-7
- Gimenez-Nadal, J. I., & Sevilla, A. (2012). Trends in time allocation: A cross-country analysis. *European Economic Review, 56*(6), 1338-1359. doi:10.1016/j.euroecorev.2012.02.011
- Guevremont, A., Findlay, L., & Kohen, D. (2014). Organized extracurricular activities: Are in-school and out-of-school activities associated with different outcomes for Canadian youth? *Journal of School Health, 84*(5), 317-325. doi:10.1111/josh.12154
- Haapasalo, I., Valimaa, R., & Kannas, L. (2010). How comprehensive school students perceive their psychosocial school environment. *Scandinavian Journal of Educational Research, 54*(2), 133-150. doi:10.1080/00313831003637915
- Hall, G. S. (1904). *Adolescence: Its psychology and its relation to physiology, anthropology, sociology, sex, crime, religion, and education* (Vol. Vol I & II). New York: Appleton.
- Hallal, P. C., Victora, C. G., Azevedo, M. R., & Wells, J. C. K. (2006). Adolescent physical activity and health - A systematic review. *Sports Medicine, 36*(12), 1019-1030. doi:10.2165/00007256-200636120-00003
- Haller, C. S., & Courvoisier, D. S. (2010). Personality and thinking style in different creative domains. *Psychology of Aesthetics Creativity and the Arts, 4*(3), 149-160. doi:10.1037/a0017084
- Hamplova, D., & Nespor, Z. R. (2009). Invisible religion in a "non-believing" country: The case of the Czech Republic. *Social Compass, 56*(4), 581-597. doi:10.1177/0037768609345975
- Hansen, D. M., & Larson, R. W. (2007). Amplifiers of developmental and negative experiences in organized activities: Dosage, motivation, lead roles, and adult-youth ratios. *Journal of Applied Developmental Psychology, 28*(4), 360-374. doi:10.1016/j.appdev.2007.04.006
- Hansen, D. M., Larson, R. W., & Dworkin, J. B. (2003). What adolescents learn in organized youth activities: A survey of self-reported developmental experiences. *Journal of Research on Adolescence, 13*(1), 25-55. doi:10.1111/1532-7795.1301006
- Hansen, D. M., Skorupski, W. P., & Arrington, T. L. (2010). Differences in developmental experiences for commonly used categories of organized youth activities. *Journal of Applied Developmental Psychology, 31*(6), 413-421. doi:10.1016/j.appdev.2010.07.001
- Harrington, M. (2015). Practices and meaning of purposive family leisure among working- and middle-class families. *Leisure Studies, 34*(4), 471-486. doi:10.1080/02614367.2014.938767
- Haynie, D. L., & Osgood, D. W. (2005). Reconsidering peers and delinquency: How do peers matter? *Social Forces, 84*(2), 1109-1130. doi:10.1353/sof.2006.0018
- Heaslip, G. P., & Barber, B. L. (2017). Extracurricular activity intensity and adolescent risk-taking: Exploring interactive effects of contextual risk and coping efficacy. *The Educational and Developmental Psychologist, 34*(1), 62-77. doi:10.1017/edp.2016.19
- Hilbrecht, M., Zuzanek, J., & Mannell, R. C. (2008). Time use, time pressure and gendered behavior in early and late adolescence. *Sex Roles, 58*(5-6), 342-357. doi:10.1007/s11199-007-9347-5
- Himelfarb, I., Lac, A., & Baharav, H. (2014). Examining school-related delinquencies, extracurricular activities, and grades in adolescents. *Educational Studies, 40*(1), 81-97. doi:10.1080/03055698.2013.821941
- Hoeben, E. M., & Weerman, F. M. (2016). Why is involvement in unstructured socializing related to adolescent delinquency? *Criminology, 54*(2), 242-281. doi:10.1111/1745-9125.12105
- Hoffmann, J. P. (2006). Extracurricular activities, athletic participation, and adolescent alcohol use: Gender-differentiated and school-contextual effects. *Journal of Health and Social Behavior, 47*(3), 275-290.
- Holloway, S. L., & Pimlott-Wilson, H. (2014). Enriching children, institutionalizing childhood? Geographies of play, extracurricular activities, and parenting in England. *Annals of the Association of American Geographers, 104*(3), 613-627. doi:10.1080/00045608.2013.846167
- Hunt, E., McKay, E. A., Dahly, D. L., Fitzgerald, A. P., & Perry, I. J. (2015). A person-centred analysis of the time-use, daily activities and health-related quality of life of Irish school-going late adolescents. *Quality of Life Research, 24*(6), 1303-1315. doi:10.1007/s11136-014-0863-9

- Hurrelmann, K., & Richter, M. (2006). Risk behaviour in adolescence: The relationship between developmental and health problems. *Journal of Public Health, 14*(1), 20-28.
- Chesters, J., & Smith, J. (2015). Social capital and aspirations for educational attainment: A cross-national comparison of Australia and Germany. *Journal of Youth Studies, 18*(7), 932-949. doi:10.1080/13676261.2014.1001831
- Iannotti, R. J., Chen, R. S., Kololo, H., Petronyite, G., Haug, E., & Roberts, C. (2013). Motivations for adolescent participation in leisure-time physical activity: International differences. *Journal of Physical Activity & Health, 10*(1), 106-112.
- Idler, E. L., & Benyamini, Y. (1997). Self-rated health and mortality: A review of twenty-seven community studies. *Journal of Health and Social Behavior, 38*(1), 21-37. doi:10.2307/2955359
- Inchley, J., Currie, D., Young, T., Samdal, O., Torsheim, T., Augustson, L., . . . Barnekow, V. (Eds.). (2016). *Growing up unequal: gender and socioeconomic differences in young people's health and well-being*. Copenhagen: WHO Regional Office for Europe.
- Jacobs, J. E., & Eccles, J. S. (2000). Parents, task values, and real life achievement choices. In C. Sansone & J. Harackiewicz (Eds.), *Intrinsic motivation* (pp. 405-439). San Diego, CA: Academic.
- Jaeger, M. M., & Breen, R. (2016). A dynamic model of cultural reproduction. *American Journal of Sociology, 121*(4), 1079-1115.
- Janssen, I., & LeBlanc, A. G. (2010). Systematic review of the health benefits of physical activity and fitness in school-aged children and youth. *International Journal of Behavioral Nutrition and Physical Activity, 7*(40). doi:10.1186/1479-5868-7-40
- Jelicic, H., Bobek, D. L., Phelps, E., Lerner, R. M., & Lerner, J. V. (2007). Using positive youth development to predict contribution and risk behaviors in early adolescence: Findings from the first two waves of the 4-H study of positive youth development. *International Journal of Behavioral Development, 31*(3), 263-273. doi:10.1177/0165025407076439
- Juniu, S. (2000). Downshifting: Regaining the essence of leisure. *Journal of Leisure Research, 32*(1), 69-73.
- Kaufman, L. R., & Rousseeuw, P. J. (1990). *Finding groups in data: An introduction to cluster analysis*. Hoboken: John Wiley & Sons Inc.
- Keijsers, L., & Poulin, F. (2013). Developmental changes in parent-child communication throughout adolescence. *Developmental Psychology, 49*(12), 2301-2308. doi:10.1037/a0032217
- Kenny, R., Dooley, B., & Fitzgerald, A. (2013). Interpersonal relationships and emotional distress in adolescence. *Journal of Adolescence, 36*(2), 351-360. doi:10.1016/j.adolescence.2012.12.005
- Kiesner, J., Poulin, F., & Dishion, T. J. (2010). Adolescent substance use with friends moderating and mediating effects of parental monitoring and peer activity contexts. *Merrill-Palmer Quarterly-Journal of Developmental Psychology, 56*(4), 529-556.
- Kleiber, D. A., & Powell, G. M. (2005). Historical change in leisure activities during after-school hours. In J. L. Mahoney, R. W. Larson, & J. S. Eccles (Eds.), *Organized activities as contexts of development* (pp. 23-44). Mahwah, New Jersey: Lawrence Erlbaum Associates.
- Knifsend, C. A., & Graham, S. (2012). Too much of a good thing? How breadth of extracurricular participation relates to school-related affect and academic outcomes during adolescence. *Journal of Youth and Adolescence, 41*(3), 379-389. doi:10.1007/s10964-011-9737-4
- Koepke, S., & Denissen, J. J. A. (2012). Dynamics of identity development and separation-individuation in parent-child relationships during adolescence and emerging adulthood - A conceptual integration. *Developmental Review, 32*(1), 67-88. doi:10.1016/j.dr.2012.01.001
- Kopcakova, J., Veselska, Z. D., Geckova, A. M., Kalman, M., van Dijk, J. P., & Reijneveld, S. A. (2015). Do motives to undertake physical activity relate to physical activity in adolescent boys and girls? *International Journal of Environmental Research and Public Health, 12*(7), 7656-7666. doi:10.3390/ijerph120707656
- Kreager, D. A. (2007). Unnecessary roughness? School sports, peer networks, and male adolescent violence. *American Sociological Review, 72*(6), 705-724. doi:10.1177/000312240707200503
- Kristjansson, A. L., James, J. E., Allegrante, J. P., Sigfusdottir, I. D., & Helgason, A. R. (2010). Adolescent substance use, parental monitoring, and leisure-time activities: 12-year outcomes of primary prevention in Iceland. *Preventive Medicine, 51*(2), 168-171. doi:10.1016/j.ypmed.2010.05.001
- Kuhn, E. S., & Laird, R. D. (2011). Individual differences in early adolescents' beliefs in the legitimacy of parental authority. *Developmental Psychology, 47*(5), 1353-1365. doi:10.1037/a0024050
- Lam, C. B., & McHale, S. M. (2015). Developmental patterns and parental correlates of youth leisure-time physical activity. *Journal of Family Psychology, 29*(1), 100-107. doi:10.1037/fam0000049
- Larson, R. W. (2000). Toward a psychology of positive youth development. *American Psychologist, 55*(1), 170-183. doi:10.1037//0003-066x.55.1.170
- Larson, R. W. (2001). How US children and adolescents spend time: What it does (and doesn't) tell us about their development. *Current Directions in Psychological Science, 10*(5), 160-164. doi:10.1111/1467-8721.00139

- Larson, R. W., Hansen, D. M., & Moneta, G. (2006). Differing profiles of developmental experiences across types of organized youth activities. *Developmental Psychology, 42*(5), 849-863. doi:10.1037/0012-1649.42.5.849
- Larson, R. W., Pearce, N., Sullivan, P. J., & Jarrett, R. L. (2007). Participation in youth programs as a catalyst for negotiation of family autonomy with connection. *Journal of Youth and Adolescence, 36*(1), 31-45. doi:10.1007/s10964-006-9133-7
- Larson, R. W., & Verma, S. (1999). How children and adolescents spend time across the world: Work, play, and developmental opportunities. *Psychological Bulletin, 125*(6), 701-736. doi:10.1037//0033-2909.125.6.701
- Larson, R. W., & Walker, K. C. (2010). Dilemmas of Practice: Challenges to Program Quality Encountered by Youth Program Leaders. *American Journal of Community Psychology, 45*(3-4), 338-349. doi:10.1007/s10464-010-9307-z
- Lawman, H. G., & Wilson, D. K. (2012). A review of family and environmental correlates of health behaviors in high-risk youth. *Obesity, 20*(6), 1142-1157. doi:10.1038/oby.2011.376
- Lee, K. T. H., & Vandell, D. L. (2015). Out-of-school time and adolescent substance use. *Journal of Adolescent Health, 57*(5), 523-529. doi:10.1016/j.jadohealth.2015.07.003
- Lerner, R. M. (2005). *Promoting positive youth development: Theoretical and empirical bases*. Washington DC: National Research Council/Institute of Medicine National Academy of Sciences.
- Lerner, R. M., Bowers, E. P., Geldhof, G. J., Gestsdóttir, S., & DeSouza, L. (2012). Promoting positive youth development in the face of contextual changes and challenges: The roles of individual strengths and ecological assets. *New Directions for Youth Development, 2012*(135), 119-128.
- Lerner, R. M., von Eye, A., Lerner, J. V., Lewin-Bizan, S., & Bowers, E. P. (2010). Special issue introduction: The meaning and measurement of thriving: A view of the issues. *Journal of Youth and Adolescence, 39*(7), 707-719. doi:10.1007/s10964-010-9531-8
- Leversen, I., Danielsen, A. G., Birkeland, M. S., & Samdal, O. (2012). Basic psychological need satisfaction in leisure activities and adolescents' life satisfaction. *Journal of Youth and Adolescence, 41*(12), 1588-1599. doi:10.1007/s10964-012-9776-5
- Lewin-Bizan, S., Lynch, A. D., Fay, K., Schmid, K., McPherran, C., Lerner, J. V., & Lerner, R. M. (2010). Trajectories of positive and negative behaviors from early- to middle-adolescence. *Journal of Youth and Adolescence, 39*(7), 751-763. doi:10.1007/s10964-010-9532-7
- Linver, M. R., Roth, J. L., & Brooks-Gunn, J. (2009). Patterns of adolescents' participation in organized activities: Are sports best when combined with other activities? *Developmental Psychology, 45*(2), 354-367. doi:10.1037/a0014133
- Linville, D. C., & Huebner, A. J. (2005). The analysis of extracurricular activities and their relationship to youth violence. *Journal of Youth and Adolescence, 34*(5), 483-492. doi:10.1007/s10964-005-7265-9
- Lolich, M., Vazquez, G. H., Zapata, S., Akiskal, K. K., & Akiskal, H. S. (2015). Affective temperaments in tango dancers. *Journal of Affective Disorders, 173*, 27-30. doi:10.1016/j.jad.2014.10.018
- Lopez-Sintas, J., Rojas-DeFrancisco, L., & Garcia-Alvarez, E. (2017). Home-based digital leisure: Doing the same leisure activities, but digital. *Cogent Social Sciences, 3*, 1309741. doi:10.1080/23311886.2017.1309741
- Luthar, S. S., Shoum, K. A., & Brown, P. J. (2006). Extracurricular involvement among affluent youth: A scapegoat for "ubiquitous achievement pressures"? *Developmental Psychology, 42*(3), 583-597. doi:10.1037/0012-1649.42.3.583
- Lynch, A. D., Ferris, K. A., Burkhard, B., Wang, J., Hershberg, R. M., & Lerner, R. M. (2016). Character development within youth development programs: Exploring multiple dimensions of activity involvement. *American Journal of Community Psychology, 57*(1-2), 73-86. doi:10.1002/ajcp.12035
- Maffulli, N., Longo, U. G., Gougoulias, N., Caine, D., & Denaro, V. (2011). Sport injuries: a review of outcomes. *British Medical Bulletin, 97*(1), 47-80. doi:10.1093/bmb/ldq026
- Mahoney, J. L., & Cairns, R. B. (1997). Do extracurricular activities protect against early school dropout? *Developmental Psychology, 33*(2), 241-253. doi:10.1037/0012-1649.33.2.241
- Mahoney, J. L., & Eccles, J. S. (2005). Organized activity participation for children from low- and middle-income families. In A. Booth & A. C. Crouter (Eds.), *Disparities in school readiness* (pp. 207-222). New York: Lawrence Erlbaum Associates.
- Mahoney, J. L., Harris, A. L., & Eccles, J. S. (2006). Organized activity participation, positive youth development, and the over-scheduling hypothesis. *Social Policy Report, 20*(4), 3-30.
- Mahoney, J. L., Larson, R. W., Eccles, J. S., & Lord, H. (2005). Organized activities as developmental contexts for children and adolescents. In J. L. Mahoney, R. W. Larson, & J. S. Eccles (Eds.), *Organized activities as contexts of development* (pp. 3-22). Mahwah, New Jersey: Lawrence Erlbaum Associates.
- Mahoney, J. L., & Stattin, H. (2000). Leisure activities and adolescent antisocial behavior: The role of structure and social context. *Journal of Adolescence, 23*(2), 113-127. doi:10.1006/jado.2000.0302



- Mahoney, J. L., Stattin, H., & Lord, H. (2004). Unstructured youth recreation centre participation and antisocial behaviour development: Selection influences and the moderating role of antisocial peers. *International Journal of Behavioral Development, 28*(6), 553-560. doi:10.1080/01650250444000270
- Mahoney, J. L., & Vest, A. E. (2012). The over-scheduling hypothesis revisited: Intensity of organized activity participation during adolescence and young adult outcomes. *Journal of Research on Adolescence, 22*(3), 409-418. doi:10.1111/j.1532-7795.2012.00808.x
- Martin, L., Bruner, M., Eys, M., & Spink, K. (2014). The social environment in sport: Selected topics. *International Review of Sport and Exercise Psychology, 7*(1), 87-105. doi:10.1080/1750984x.2014.885553
- Martin, M. J., Conger, R. D., Sitnick, S. L., Masarik, A. S., Forbes, E. E., & Shaw, D. S. (2015). Reducing risk for substance use by economically disadvantaged young men: Positive family environments and pathways to educational attainment. *Child Development, 86*(6), 1719-1737. doi:10.1111/cdev.12413
- Mason, M. J., Schmidt, C., Abraham, A., Walker, L., & Tercyak, K. (2009). Adolescents' social environment and depression: Social networks, extracurricular activity, and family relationship influences. *Journal of Clinical Psychology in Medical Settings, 16*(4), 346-354. doi:10.1007/s10880-009-9169-4
- Mattila, V., Parkkari, J., Kannus, P., & Rimpela, A. (2004). Occurrence and risk factors of unintentional injuries among 12-to 18-year-old Finns - A survey of 8219 adolescents. *European Journal of Epidemiology, 19*(5), 437-444. doi:10.1023/B:EJEP.0000027355.85493.cb
- Mattila, V. M., Parkkari, J., Lintonen, T., Kannus, P., & Rimpela, A. (2005). Occurrence of violence and violence-related injuries among 12-18 year-old Finns. *Scandinavian Journal of Public Health, 33*(4), 307-313. doi:10.1080/14034940510005851
- McCabe, K. O., Modecki, K. L., & Barber, B. L. (2016). Participation in organized activities protects against adolescents' risky substance use, even beyond development in conscientiousness. *Journal of Youth and Adolescence, 45*(11), 2292-2306. doi:10.1007/s10964-016-0454-x
- McGue, M., Elkins, I., Walden, B., & Iacono, W. G. (2005). Perceptions of the parent-adolescent relationship: A longitudinal investigation. *Developmental Psychology, 41*(6), 971-984. doi:10.1037/0012-1649.41.6.974
- McMillan, R., Mclsaac, M., & Janssen, I. (2016). Family structure as a correlate of organized sport participation among youth. *Plos One, 11*(2), e0147403. doi:10.1371/journal.pone.0147403
- Metsäpelto, R. L., & Pulkkinen, L. (2012). Socioemotional behavior and school achievement in relation to extracurricular activity participation in middle childhood. *Scandinavian Journal of Educational Research, 56*(2), 167-182. doi:10.1080/00313831.2011.581681
- Metzger, A., Crean, H. F., & Forbes-Jones, E. L. (2009). Patterns of organized activity participation in urban, early adolescents associations with academic achievement, problem behaviors, and perceived adult support. *Journal of Early Adolescence, 29*(3), 426-442. doi:10.1177/0272431608322949
- Metzger, A., Dawes, N., Mermelstein, R., & Wakschlag, L. (2011). Longitudinal modeling of adolescents' activity involvement, problem peer associations, and youth smoking. *Journal of Applied Developmental Psychology, 32*(1), 1-9. doi:10.1016/j.appdev.2010.09.005
- Michaelson, V., Robinson, P., & Pickett, W. (2014). Participation in church or religious groups and its association with health: A national study of young Canadians. *Journal of Religion & Health, 53*(5), 1353-1373. doi:10.1007/s10943-013-9726-x
- Miller, J. A., Caldwell, L. L., Weybright, E. H., Smith, E. A., Vergnani, T., & Wegner, L. (2014). Was Bob Seger right? Relation between boredom in leisure and risky sex. *Leisure Sciences, 36*(1), 52-67. doi:10.1080/01490400.2014.860789
- Moffitt, T. E. (1993). Adolescence-limited and life-course-persistent antisocial-behavior – A developmental taxonomy. *Psychological Review, 100*(4), 674-701. doi:10.1037/0033-295x.100.4.674
- Morris, D. S. (2015). Actively closing the gap? Social class, organized activities, and academic achievement in high school. *Youth & Society, 47*(2), 267-290. doi:10.1177/0044118x12461159
- Motamedi, M., Caldwell, L., Wegner, L., Smith, E., & Jones, D. (2016). Girls just want to know where to have fun: Preventing substance use initiation in an under-resourced community in South Africa through HealthWise. *Prevention Science, 17*(6), 700-709. doi:10.1007/s11121-016-0654-3
- Mueller, M. K., Phelps, E., Bowers, E. R., Agans, J. P., Urban, J. B., & Lerner, R. M. (2011). Youth development program participation and intentional self-regulation skills: Contextual and individual bases of pathways to positive youth development. *Journal of Adolescence, 34*(6), 1115-1125. doi:10.1016/j.adolescence.2011.07.010
- Neely, S. R., & Vaquera, E. (2017). Making it count: Breadth and intensity of extracurricular engagement and high school dropout. *Sociological Perspectives, 1*-24. doi:10.1177/0731121417700114
- Nelson, I. A., & Gastic, B. (2009). Street ball, swim team and the sour cream machine: A cluster analysis of out of school time participation portfolios. *Journal of Youth and Adolescence, 38*(9), 1172-1186. doi:10.1007/s10964-008-9372-x
- Newland, L. A., Lawler, M. J., Giger, J. T., Roh, S., & Carr, E. R. (2015). Predictors of children's subjective well-being in rural communities of the United States. *Child Indicators Research, 8*(1), 177-198. doi:10.1007/s12187-014-9287-x

- Newman, D. B., Tay, L., & Diener, E. (2014). Leisure and subjective well-being: A model of psychological mechanisms as mediating factors. *Journal of Happiness Studies*, 15(3), 555-578. doi:10.1007/s10902-013-9435-x
- O'Brien, K. S., Kolt, G. S., Martens, M. P., Ruffman, T., Miller, P. G., & Lynott, D. (2012). Alcohol-related aggression and antisocial behaviour in sportspeople/athletes. *Journal of Science and Medicine in Sport*, 15(4), 292-297. doi:10.1016/j.jsams.2011.10.008
- OECD. (2016). *Income inequality remains high in the face of weak recovery*. Retrieved on 16 May, 2017 from <http://www.oecd.org/social/OECD2016-Income-Inequality-Update.pdf>
- Olds, T., Wake, M., Patton, G., Ridley, K., Waters, E., Williams, J., & Hesketh, K. (2009). How do school-day activity patterns differ with age and gender across adolescence? *Journal of Adolescent Health*, 44(1), 64-72. doi:10.1016/j.jadohealth.2008.05.003
- Oner, O., & Klaesson, J. (2017). Location of leisure: the New Economic Geography of leisure services. *Leisure Studies*, 36(2), 203-219. doi:10.1080/02614367.2016.1246588
- Opaschowski, H. W. (1976). *Pädagogik der Freizeit. Grundlegung für Wissenschaft und Praxis*. Bad Heilbrunn: OBB.
- Orlin, M. N., Palisano, R. J., Chiarello, L. A., Kang, L. J., Polansky, M., Almasri, N., & Maggs, J. (2010). Participation in home, extracurricular, and community activities among children and young people with cerebral palsy. *Developmental Medicine and Child Neurology*, 52(2), 160-166. doi:10.1111/j.1469-8749.2009.03363.x
- Osgood, D. W., Anderson, A. L., & Shaffer, J. N. (2005). Unstructured leisure in the after-school hours. In J. L. Mahoney, R. W. Larson, & J. S. Eccles (Eds.), *Organized activities as contexts of development* (pp. 45-64). Mahwah, New Jersey: Lawrence Erlbaum Associates.
- Ottova, V., Erhart, M., Vollebergh, W., Kokonyei, G., Morgan, A., Gobina, I., . . . HBSC Positive Health Focus Group (2012). The role of individual- and macro-level social determinants on young adolescents' psychosomatic complaints. *Journal of Early Adolescence*, 32(1), 126-158. doi:10.1177/0272431611419510
- Palen, L.-A., & Coatsworth, J. D. (2007). Activity-based identity experiences and their relations to problem behavior and psychological well-being in adolescence. *Journal of Adolescence*, 30(5), 721-737. doi:10.1016/j.adolescence.2006.11.003
- Pearson, N., & Biddle, S. J. H. (2011). Sedentary behavior and dietary intake in children, adolescents, and adults: A systematic review. *American Journal of Preventive Medicine*, 41(2), 178-188. doi:10.1016/j.amepre.2011.05.002
- Perks, T., & Haan, M. (2011). Youth religious involvement and adult community participation: Do levels of youth religious involvement matter? *Nonprofit and Voluntary Sector Quarterly*, 40(1), 107-129. doi:10.1177/0899764009357794
- Persson, A., Kerr, M., & Stattin, H. (2007). Staying in or moving away from structured activities: Explanations involving parents and peers. *Developmental Psychology*, 43(1), 197-207. doi:10.1037/0012-1649.43.1.197
- Phelps, E., Zimmerman, S., Warren, A. E. A., Jelicic, H., von Eye, A., & Lerner, R. M. (2009). The structure and developmental course of Positive Youth Development (PYD) in early adolescence: Implications for theory and practice. *Journal of Applied Developmental Psychology*, 30(5), 571-584. doi:10.1016/j.appdev.2009.06.003
- Pickett, W., Dostaler, S., Craig, W., Janssen, I., Simpson, K., Shelley, S. D., & Boyce, W. F. (2006). Associations between risk behavior and injury and the protective roles of social environments: an analysis of 7235 Canadian school children. *Injury Prevention*, 12(2), 87-92. doi:10.1136/ip.2005.011106
- Pitel, L., Geckova, A. M., Kolarcik, P., Halama, P., Reijneveld, S. A., & van Dijk, J. P. (2012). Gender differences in the relationship between religiosity and health-related behaviour among adolescents. *Journal of Epidemiology and Community Health*, 66(12), 1122-1128. doi:10.1136/jech-2011-200914
- Pulver, A., Davison, C., & Pickett, W. (2015). Time-use patterns and the recreational use of prescription medications among rural and small town youth. *Journal of Rural Health*, 31(2), 217-228. doi:10.1111/jrh.12103
- Ramey, H. L., & Rose-Krasnor, L. (2012). Contexts of structured youth activities and positive youth development. *Child Development Perspectives*, 6(1), 85-91. doi:10.1111/j.1750-8606.2011.00219.x
- Randall, E. T., & Bohnert, A. M. (2012). Understanding threshold effects of organized activity involvement in adolescents: Sex and family income as moderators. *Journal of Adolescence*, 35(1), 107-118. doi:10.1016/j.adolescence.2011.05.004
- Ravens-Sieberer, U., Kökényei, G., & Thomas, C. (2004). School and health. In C. Currie, C. Roberts, A. Morgan, R. Smith, W. Settertobulte, O. Samdal, & V. B. Rasmussen (Eds.), *Young people's health in context, Health Behaviour in School-aged Children study: International Report from the 2001/2002 survey*. (pp. 184-195). Copenhagen: WHO Regional Office for Europe.

- Resnick, M. D., Catalano, R. F., Sawyer, S. M., Viner, R., & Patton, G. C. (2012). Seizing the opportunities of adolescent health. *Lancet*, *379*(9826), 1564-1567. doi:10.1016/s0140-6736(12)60472-3
- Riese, A., Gjelsvik, A., & Ranney, M. L. (2015). Extracurricular activities and bullying perpetration: Results from a nationally representative sample. *Journal of School Health*, *85*(8), 544-551. doi:10.1111/josh.12282
- Roberts, C., Freeman, J., Samdal, O., Schnohr, C. W., de Looze, M. E., Gabhainn, S. N., . . . International HBSC Study Group. (2009). The Health Behaviour in School-aged Children (HBSC) study: methodological developments and current tensions. *International Journal of Public Health*, *54*, 140-150. doi:10.1007/s00038-009-5405-9
- Rose-Krasnor, L., Busseri, M. A., Willoughby, T., & Chalmers, H. (2006). Breadth and intensity of youth activity involvement as contexts for positive development. *Journal of Youth and Adolescence*, *35*(3), 385-399. doi:10.1007/s10964-006-9037-6
- Ross, S. E. T., Dowda, M., Beets, M. W., & Pate, R. R. (2013). Physical activity behavior and related characteristics of highly active eighth-grade girls. *Journal of Adolescent Health*, *52*(6), 745-751. doi:10.1016/j.jadohealth.2012.12.003
- Roth, J. L., & Brooks-Gunn, J. (2003). Youth development programs: Risk, prevention and policy. *Journal of Adolescent Health*, *32*(3), 170-182. doi:10.1016/s1054-139x(02)00421-4
- Running USA. (2017). U.S. road race trends. Retrieved on 21 August, 2017 from <http://www.runningusa.org/2017-us-road-race-trends>
- Salas-Wright, C. P., Vaughn, M. G., & Maynard, B. R. (2014). Religiosity and violence among adolescents in the United States: Findings from the National Survey on Drug Use and Health 2006-2010. *Journal of Interpersonal Violence*, *29*(7), 1178-1200. doi:10.1177/0886260513506279
- Sallis, J. F., Prochaska, J. J., & Taylor, W. C. (2000). A review of correlates of physical activity of children and adolescents. *Medicine and Science in Sports and Exercise*, *32*(5), 963-975.
- Sarriera, J. C., Casas, F., Bedin, L., Paradiso, A. C., Abs, D., & Gonzalez, M. (2014). Aspects of leisure on adolescent's well-being in two countries. *Child Indicators Research*, *7*(2), 245-265. doi:10.1007/s12187-013-9220-8
- Sharp, E. H., Tucker, C. J., Baril, M. E., Van Gundy, K. T., & Rebellon, C. J. (2015). Breadth of participation in organized and unstructured leisure activities over time and rural adolescents' functioning. *Journal of Youth and Adolescence*, *44*(1), 62-76. doi:10.1007/s10964-014-0153-4
- Shaw, S. M., & Dawson, D. (2001). Purposive leisure: Examining parental discourses on family activities. *Leisure Sciences*, *23*(4), 217-231. doi:10.1080/01490400152809098
- Schaefer, D. R., Simpkins, S. D., Vest, A. E., & Price, C. D. (2011). The contribution of extracurricular activities to adolescent friendships: New insights through social network analysis. *Developmental Psychology*, *47*(4), 1141-1152. doi:10.1037/a0024091
- Schmalz, D. L., & Kerstetter, D. L. (2006). Girlie girls and manly men: Children's stigma consciousness of gender in sports and physical activities. *Journal of Leisure Research*, *38*(4), 536-557.
- Siennick, S. E., & Osgood, D. W. (2012). Hanging out with which friends? Friendship-level predictors of unstructured and unsupervised socializing in adolescence. *Journal of Research on Adolescence*, *22*(4), 646-661. doi:10.1111/j.1532-7795.2012.00812.x
- Sigmundova, D., Sigmund, E., Vokacova, J., & Kopcakova, J. (2014). Parent-child associations in pedometer-determined physical activity and sedentary behaviour on weekdays and weekends in random samples of families in the Czech Republic. *International Journal of Environmental Research and Public Health*, *11*(7), 7163-7181. doi:10.3390/ijerph110707163
- Simpkins, S. D., Davis-Kean, P. E., & Eccles, J. S. (2005). Parents' socializing behavior and children's participation in math, science, and computer out-of-school activities. *Applied Developmental Science*, *9*(1), 14-30. doi:10.1207/s1532480xads0901\_3
- Simpkins, S. D., Fredricks, J. A., & Eccles, J. S. (2012). Charting the Eccles' Expectancy-Value Model from mothers' beliefs in childhood to youths' activities in adolescence. *Developmental Psychology*, *48*(4), 1019-1032. doi:10.1037/a0027468
- Simpkins, S. D., Vest, A. E., & Price, C. D. (2011). Intergenerational continuity and discontinuity in Mexican-origin youths' participation in organized activities: Insights from mixed-methods. *Journal of Family Psychology*, *25*(6), 814-824. doi:10.1037/a0025853
- Sisjord, M. K. (2015). Assessing the sociology of sport: On lifestyle sport and gender. *International Review for the Sociology of Sport*, *50*(4-5), 596-600. doi:10.1177/1012690214552432
- Slater, A., & Tiggemann, M. (2011). Gender differences in adolescent sport participation, teasing, self-objectification and body image concerns. *Journal of Adolescence*, *34*(3), 455-463. doi:10.1016/j.adolescence.2010.06.007
- Smith, C., Denton, M. L., Faris, R., & Regnerus, M. (2002). Mapping American adolescent religious participation. *Journal for the Scientific Study of Religion*, *41*(4), 597-612. doi:10.1111/1468-5906.00148
- Solberg, M. E., Olweus, D., & Endresen, I. M. (2007). Bullies and victims at school: Are they the same pupils? *British Journal of Educational Psychology*, *77*, 441-464. doi:10.1348/000709906x105689

- Spilkova, J. (2015). Leisure time preferences and health-risk behavior of teenagers in the post-communist Central European countries. *Childrens Geographies*, 13(4), 435-450. doi:10.1080/14733285.2013.848742
- Strenze, T. (2007). Intelligence and socioeconomic success: A meta-analytic review of longitudinal research. *Intelligence*, 35(5), 401-426. doi:10.1016/j.intell.2006.09.004
- Suhrcke, M., & de Paz Nieves, C. (2011). *The impact of health and health behaviours on educational outcomes in high-income countries: a review of the evidence*. Copenhagen: WHO Regional Office for Europe.
- Svensson, R., & Oberwittler, D. (2010). It's not the time they spend, it's what they do: The interaction between delinquent friends and unstructured routine activity on delinquency – Findings from two countries. *Journal of Criminal Justice*, 38(5), 1006-1014. doi:10.1016/j.jcrimjus.2010.07.002
- Sweeting, H., West, P., & Richards, M. (1998). Teenage family life, lifestyles and life chances: Associations with family structure, conflict with parents and joint family activity. *International Journal of Law, Policy and the Family*, 12, 15-46.
- Takakura, M. (2015). Relations of participation in organized activities to smoking and drinking among Japanese youth: contextual effects of structural social capital in high school. *International Journal of Public Health*, 60(6), 679-689. doi:10.1007/s00038-015-0697-4
- Telford, R. M., Telford, R. D., Olive, L. S., Cochrane, T., & Davey, R. (2016). Why are girls less physically active than boys? Findings from the LOOK Longitudinal Study. *Plos One*, 11(3). doi:10.1371/journal.pone.0150041
- Theokas, C., Almerigi, J. B., Lerner, R. M., Dowling, E. M., Benson, P. L., Scales, P. C., & von Eye, A. (2005). Conceptualizing and modeling individual and ecological asset components of thriving in early adolescence. *Journal of Early Adolescence*, 25(1), 113-143. doi:10.1177/0272431604272460
- Torsheim, T., Aaroe, L. E., & Wold, B. (2001). Sense of coherence and school-related stress as predictors of subjective health complaints in early adolescence: interactive, indirect or direct relationships? *Social Science & Medicine*, 53(5), 603-614. doi:10.1016/s0277-9536(00)00370-1
- Trainor, S., Delfabbro, P., Anderson, S., & Winefield, A. (2010). Leisure activities and adolescent psychological well-being. *Journal of Adolescence*, 33(1), 173-186. doi:10.1016/j.adolescence.2009.03.013
- Tremblay, M. S., LeBlanc, A. G., Kho, M. E., Saunders, T. J., Larouche, R., Colley, R. C., . . . Gorber, S. C. (2011). Systematic review of sedentary behaviour and health indicators in school-aged children and youth. *International Journal of Behavioral Nutrition and Physical Activity*, 8(98). doi:10.1186/1479-5868-8-98
- Trussell, D. E., & Shaw, S. M. (2012). Organized youth sport and parenting in public and private spaces. *Leisure Sciences*, 34(5), 377-394. doi:10.1080/01490400.2012.714699
- van Bottenburg, M., & Salome, L. (2010). The indoorisation of outdoor sports: an exploration of the rise of lifestyle sports in artificial settings. *Leisure Studies*, 29(2), 143-160. doi:10.1080/02614360903261479
- Van der Horst, K., Paw, M., Twisk, J. W. R., & Van Mechelen, W. (2007). A brief review on correlates of physical activity and sedentariness in youth. *Medicine and Science in Sports and Exercise*, 39(8), 1241-1250. doi:10.1249/mss.0b013e318059bf35
- van Nieuwenhuijzen, M., Junger, M., Velderman, M. K., Wiefferink, K. H., Paulussen, T., Hox, J., & Reijneveld, S. A. (2009). Clustering of health-compromising behavior and delinquency in adolescents and adults in the Dutch population. *Preventive Medicine*, 48(6), 572-578. doi:10.1016/j.ypmed.2009.04.008
- Veliz, P., Schulenberg, J., Patrick, M., Kloska, D., McCabe, S. E., & Zarrett, N. (2017). Competitive sports participation in high school and subsequent substance use in young adulthood: Assessing differences based on level of contact. *International Review for the Sociology of Sport*, 52(2). doi:10.1177/1012690215586998
- Vereecken, C. (2001). Paper pencil versus pc administered querying of a study on health behaviour in school-aged children. *Archives of Public Health*, 59(1), 43-61.
- Viau, A., Denault, A.-S., & Poulin, F. (2015). Organized activities during high school and adjustment one year post high school: Identifying social mediators. *Journal of Youth and Adolescence*, 44(8), 1638-1651. doi:10.1007/s10964-014-0225-5
- Vilhjalmsson, R., & Kristjansdottir, G. (2003). Gender differences in physical activity in older children and adolescents: the central role of organized sport. *Social Science & Medicine*, 56(2), 363-374. doi:10.1016/s0277-9536(02)00042-4
- Viner, R. M., Ozer, E. M., Denny, S., Marmot, M., Resnick, M., Fatusi, A., & Currie, C. (2012). Adolescence and the social determinants of health. *Lancet*, 379(9826), 1641-1652. doi:10.1016/s0140-6736(12)60149-4
- Vokacova, J., Badura, P., Pavelka, J., Kalman, M., & Hanus, R. (2016). Brief report: Changes in parent-adolescent joint activities between 2002 and 2014 in the Czech Republic, Health Behaviour in School-aged children (HBSC) study. *Journal of Adolescence*, 51, 1-5. doi:10.1016/j.adolescence.2016.05.006
- Voorpostel, M., van der Lippe, T., & Gershuny, J. (2010). Spending time together – Changes over four decades in leisure time spent with a spouse. *Journal of Leisure Research*, 42(2), 243-265.
- Walsh, S. D., Molcho, M., Craig, W., Harel-Fisch, Y., Quynh, H., Kukawadia, A., . . . Pickett, W. (2013). Physical and emotional health problems experienced by youth engaged in physical fighting and weapon carrying. *Plos One*, 8(2). doi:10.1371/journal.pone.0056403

- Wang, Q., Pomerantz, E. M., & Chen, H. C. (2007). The role of parents' control in early adolescents' psychological functioning: A longitudinal investigation in the United States and China. *Child Development, 78*(5), 1592-1610. doi:10.1111/j.1467-8624.2007.01085.x
- Weerman, F. M., Bernasco, W., Bruinsma, G. J. N., & Pauwels, L. J. R. (2015). When is spending time with peers related to delinquency? The importance of where, what, and with whom. *Crime & Delinquency, 61*(10), 1386-1413. doi:10.1177/0011128713478129
- Weininger, E. B., Lareau, A., & Conley, D. (2015). What money doesn't buy: Class resources and children's participation in organized extracurricular activities. *Social Forces, 94*(2), 479-503. doi:10.1093/sf/sov071
- Weiss, M. R., & Smith, A. L. (2002). Friendship quality in youth sport: Relationship to age, gender, and motivation variables. *Journal of Sport and Exercise Psychology, 24*(4), 420-437.
- Wen, M. (2008). Family structure and children's health and behavior data from the 1999 National Survey of America's Families. *Journal of Family Issues, 29*(11), 1492-1519. doi:10.1177/0192513x08320188
- Weybright, E. H., Caldwell, L. L., Ram, N., Smith, E. A., & Wegner, L. (2015). Boredom prone or nothing to do? Distinguishing between state and trait leisure boredom and its association with substance use in South African adolescents. *Leisure Sciences, 37*(4), 311-331. doi:10.1080/01490400.2015.1014530
- WHO. (2012). *WHO global report: Mortality attributable to tobacco*. Retrieved on 11 November, 2015 from [http://apps.who.int/iris/bitstream/10665/44815/1/9789241564434\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/44815/1/9789241564434_eng.pdf)
- WHO. (2014). *WHO global status report on alcohol and health 2014*. Retrieved on 11 November, 2015 from [http://apps.who.int/iris/bitstream/10665/112736/1/9789240692763\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/112736/1/9789240692763_eng.pdf)
- Wigfield, A., Eccles, J. S., Roeser, R. W., & Schiefele, U. (2006). Development of achievement motivation. In W. Damon & R. M. Lerner (Eds.), *Child and adolescent development* (pp. 406-434). Hoboken: John Wiley & Sons, Inc.
- Wight, V. R., Price, J., Bianchi, S. M., & Hunt, B. R. (2009). The time use of teenagers. *Social Science Research, 38*(4), 792-809. doi:10.1016/j.ssresearch.2009.05.009
- Wolf, S., Aber, J. L., & Morris, P. A. (2015). Patterns of time use among low-income urban minority adolescents and associations with academic outcomes and problem behaviors. *Journal of Youth and Adolescence, 44*(6), 1208-1225. doi:10.1007/s10964-015-0294-0
- Wong, M., Olds, T., Gold, L., Lycett, K., Dumuid, D., Muller, J., . . . LSAC's Child Health CheckPoint Investigator Group. (2017). Time-use patterns and health-related quality of life in adolescents. *Pediatrics, 140*(1). doi:10.1542/peds.2016-3656
- Yao, C. A., & Rhodes, R. E. (2015). Parental correlates in child and adolescent physical activity: a meta-analysis. *International Journal of Behavioral Nutrition and Physical Activity, 12*(10). doi:10.1186/s12966-015-0163-y
- Yu, S. M., Newport-Berra, M., & Liu, J. H. (2015). Out-of-school time activity participation among US-immigrant youth. *Journal of School Health, 85*(5), 281-288. doi:10.1111/josh.12255
- Zaborskis, A., Zemaitiene, N., Borup, I., Kuntsche, E., & Moreno, C. (2007). Family joint activities in a cross-national perspective. *BMC Public Health, 7*(94). doi:10.1186/1471-2458-7-94
- Zambon, A., Morgan, A., Vereecken, C., Colombini, S., Boyce, W., Mazur, J., . . . Cavallo, F. (2010). The contribution of club participation to adolescent health: evidence from six countries. *Journal of Epidemiology and Community Health, 64*(1), 89-95. doi:10.1136/jech.2009.088443
- Zarrett, N., Fay, K., Li, Y. B., Carrano, J., Phelps, E., & Lerner, R. M. (2009). More than child's play: Variable- and pattern-centered approaches for examining effects of sports participation on youth development. *Developmental Psychology, 45*(2), 368-382. doi:10.1037/a0014577
- Zick, C. D. (2010). The shifting balance of adolescent time use. *Youth & Society, 41*(4), 569-596. doi:10.1177/0044118x09338506
- Zimet, G. D. (2016). Multidimensional scale of perceived social support (MSPSS). Retrieved on 25 May, 2016 from <http://gzimet.wix.com/mspss>
- Zimet, G. D., Dahlem, N. W., Zimet, S. G., & Farley, G. K. (1988). The multidimensional scale of perceived social support. *Journal of Personality Assessment, 52*(1), 30-41. doi:10.1207/s15327752jpa5201\_2

## Summary

Leisure time represents a large portion of adolescents' time budgets, and the ways it is spent determines their lifestyle and health-related behaviours to a substantial extent. Participation in organized leisure-time activities (OLTA) is a quite common leisure-time experience for adolescents in industrialised Western nations. These sorts of activities have been identified as a context allowing the alignment of individuals' strengths with contextual developmental assets, although these activities do not usually consume more than about 6-8 hours a week. Such alignment of an individual's strengths with the assets of the context is believed to promote healthy youth development and guide an adolescent on a trajectory towards an 'ideal adulthood'. Peer-oriented, unsupervised and unstructured activities (UA) in leisure time are, in contrast, known as a context offering many opportunities for engagement in health-risk and delinquent behaviours. Moreover, some adolescents manage to find time to get involved in both types of leisure-time activities.

Most research on leisure-time activities, and on OLTA in particular, has thus far been conducted in the USA and Canada. Studies from European countries on OLTA are scarce. The aim of this thesis was therefore to examine the associations of adolescents' participation in OLTA with health- and school-related outcomes in the context of their family environment in a European setting, using a large representative sample of Czech adolescents. Furthermore, we aimed to investigate if such participation can 'buffer' expected negative outcomes of involvement in peer-oriented unsupervised UA. We also assessed whether gender, age and pattern of involvement in OLTA modified the associations with health- and school-related outcomes.

Chapter 1 presents the theoretical concepts and rationale regarding general leisure time, OLTA and UA that represent the core constructs of this thesis. Furthermore, this chapter contains the definition of the main aims and related research questions and depicts the theoretical model of the thesis.

In Chapter 2 the research sample and data collection procedure are described in detail. Data from 10 503 respondents aged 11, 13 and 15 years were derived from the 2013/2014 Health Behaviour in School-aged Children (HBSC) conducted in the Czech Republic. In this chapter, we also provide an overview of the measures and the methods of statistical analysis used.

In Chapter 3 we examine the associations between three factors of the family environment and participation in OLTA. Perceived family support, the presence of parental screen-time rules and three joint family activities (sports, walks, indoor games) done at least on a weekly basis were associated with higher odds of OLTA participation. Conversely, youth spending time in joint family TV/video watching on most days were less likely to participate in OLTA.

In Chapter 4 we present the prevalence rates of OLTA participation and explore the prevailing patterns of such participation. OLTA participants were more likely to report excellent self-rated health and high life satisfaction than non-participants, regardless of gender and age and specific pattern of participation. Participation in team and/or individual sports was, however, associated with even better general health and less frequent health complaints especially in boys, while girls appeared to benefit more from art activities.

The associations of OLTA participation with substance use, violent behaviours, injuries and truancy were assessed in Chapter 5. Participation in OLTA was associated with lower odds of weekly smoking, getting drunk recurrently and skipping school. In contrast, OLTA participants were more likely to get injured and fight repeatedly. The adolescents involved in art activities (in arts as single OLTA or in a combination of arts and sports) consistently showed the most favourable outcomes across the risk behaviours. Compared to boys, girls had a lower rate of engagement in health-risk behaviours when participating in OLTA.

In Chapter 6 we investigate the associations of OLTA participation with adolescents' school functioning. OLTA participants were more likely to report liking school, lower levels of school-related stress and above-average academic achievement than non-participants, even after adjustment for gender, age and socioeconomic status. We observed generally stronger associations with school-related outcomes among adolescents concurrently involved in various types of OLTA than among those involved only in sports. However, the latter still had better school-related outcomes than those completely uninvolved.

Chapter 7 contains information on the associations of involvement in UA with health-risk behaviours and school performance. Furthermore, we assess the degree to which concurrent participation in several OLTA modified these associations. UA were associated with regular smoking, drunkenness, potentially early experience with sexual intercourse and poor school performance. These negative outcomes were not buffered by concurrent participation in OLTA, except for potentially early sexual intercourse. Nonetheless, those engaging only in UA were more likely to engage in health-risk behaviours and do worse at school when compared to those who participated in at least one OLTA as well.

In Chapter 8 we summarise the key findings as presented in the Chapters 3-7 and discuss them in the context of contemporary scientific research. The chapter also describes the strengths and limitations of the thesis and presents implications for practice, policy and future research derived from our findings. Adolescent OLTA participants reported better health, school functioning and lower engagement in substance use than non-participants. We therefore recommended identifying the reasons for non-participation and look for ways to promote participation among those non-participants and also for ways to maintain participation of those who already participate. In contrast, UA were strongly linked to health-risk behaviours and worse school performance. In conclusion, our findings imply that OLTA represent a suitable context for healthy youth development in a European country, in line with the U.S. Positive Youth Development theory. Our findings further indicate that more comprehensive patterns of leisure-time use could better explain the associations with adolescents' health-related behaviours and related outcomes.

## Samenvatting

Vrije tijd beslaat een groot deel van de tijd die adolescenten hebben, en de manier waarop die wordt besteed bepaalt in belangrijke mate hun levensstijl en gezondheidsgerelateerde gedrag. In geïndustrialiseerde westerse landen is deelname aan georganiseerde vrijetijdsbesteding (organized leisure time activities - OLTA) een voor adolescenten vrij algemene vrijetijdsbesteding. Dit soort activiteiten wordt gezien als de context waarbinnen de sterke kanten van individuen kunnen worden gecombineerd met kansen voor hun ontwikkeling in hun omgeving, hoewel deze activiteiten meestal geen groter beslag leggen op hun totale vrijetijd dan ongeveer 6-8 uur per week. Gedacht wordt dat een dergelijke afstemming van de sterke kanten van individuen op de kansen die hun omgeving biedt een gezonde ontwikkeling van de jeugd bevordert en adolescenten stuurt op een traject richting een 'ideale volwassenheid'. Op leeftijdgenoten gerichte, niet door volwassenen begeleide en ongestructureerde activiteiten (OA) in de vrije tijd staan daarentegen bekend als een context die veel gelegenheid biedt voor betrokkenheid bij gedrag dat risico's oplevert voor riskant gezondheidsgedrag en delinquent gedrag. Daarnaast vinden sommige adolescenten tijd om betrokken te zijn bij deze beide types van vrijetijdsbesteding.

Het meeste onderzoek naar vrijetijdsbesteding, en in het bijzonder wat betreft OLTA, is tot nu toe gedaan in de Verenigde Staten en Canada. Onderzoek uit Europese landen naar OLTA is schaars. Het doel van dit proefschrift was daarom om na te gaan wat de samenhang is van deelname van adolescenten aan OLTA te met gezondheids- en school gerelateerde uitkomsten binnen een gezinsomgeving in een Europese setting. We gebruikten daarvoor een grote representatieve onderzoeksgroep van Tsjechische adolescenten. Daarnaast onderzochten we of dergelijke deelname aan OLTA de 'negatieve resultaten' van OA met leeftijdgenoten zonder toezicht kan 'bufferen'. We gingen ook na of geslacht, leeftijd en patroon van betrokkenheid bij OLTA invloed heeft op de samenhang met gezondheids- en school gerelateerde resultaten.

In Hoofdstuk 1 presenteren we de theoretische concepten en de aanleiding voor het onderzoek wat betreft algemene vrije tijd, OLTA en OA, de kernconcepten van dit proefschrift. Verder bevat dit hoofdstuk een beschrijving van de hoofddoelstellingen en de daarmee samenhangende onderzoeksvragen en geeft dit hoofdstuk het theoretische model van het proefschrift weer.

In Hoofdstuk 2 worden de onderzoeksgroep en de procedure van de gegevensverzameling in detail beschreven. Gegevens van 10 503 respondenten in de leeftijd van 11, 13 en 15 jaar werden afgeleid uit de Health Behaviour of School-aged Children-study die in 2013/2014 in Tsjechië werd uitgevoerd. In dit hoofdstuk geven we ook een overzicht van de gebruikte meetinstrumenten en analysemethoden.

In Hoofdstuk 3 wordt de samenhang tussen drie factoren uit de omgeving van het gezin en deelname aan OLTA onderzocht. Ervaren ondersteuning binnen het gezin, de aanwezigheid van ouderlijke regels met betrekking tot beeldschermtijd en het minstens wekelijks ondernemen van drie gezamenlijke familieactiviteiten (sport, wandelingen, het gezamenlijk spelen van spelletjes binnen), hangen samen met een grotere kans op OLTA-deelname. Echter, jongeren die op de meeste dagen bezig waren met in gezinsverband tv / video kijken hadden een lagere kans om deel te nemen aan OLTA.

In Hoofdstuk 4 presenteren we de prevalentie van OLTA-deelname en de meest voorkomende patronen van een dergelijke deelname. De deelnemers aan OLTA rapporteerden veel vaker een uitstekende gezondheid en een hoge tevredenheid met het leven dan niet-deelnemers, ongeacht hun geslacht en leeftijd en specifiek deelnamepatroon. Deelname aan team- en/of individuele sporten hing echter vooral bij jongens samen met een nog betere algemene gezondheid en minder frequente gezondheidsklachten, terwijl meisjes meer bleken te profiteren van kunstactiviteiten.

De samenhang tussen OLTA-deelname en middelengebruik, gewelddadig gedrag, verwondingen en spijbelen werd nagegaan in Hoofdstuk 5. OLTA-deelname hing samen met een lagere kans op wekelijks roken, herhaald dronken worden en spijbelen. In tegenstelling daarmee hadden OLTA-deelnemers meer kans om gewond te raken en regelmatig te vechten. De adolescenten die betrokken waren bij kunstactiviteiten (bij kunstactiviteiten als enige OLTA of bij een combinatie van kunst en sport) toonden steeds de meest gunstige uitkomsten met betrekking tot risicogedrag. In vergelijking



met jongens hadden meisjes een lagere mate van betrokkenheid bij gezondheidsrisico gedrag bij deelname aan OLTA.

In Hoofdstuk 6 wordt het verband tussen deelname aan OLTA en het schoolfunctioneren van adolescenten onderzocht. De deelnemers aan OLTA hadden een hogere kans om school leuk te vinden, een lager school-gerelateerd stressniveau te hebben en hogere bovengemiddelde schoolprestaties te hebben dan niet-deelnemers, zelfs na correctie voor geslacht, leeftijd en sociaal-economische status. In het algemeen vonden wij sterkere verbanden tussen schoolgerelateerde uitkomsten bij adolescenten die betrokken waren bij verschillende soorten OLTA dan bij degenen die bij één sport betrokken waren. Echter, de laatste groep had betere school-gerelateerde uitkomsten dan degenen die helemaal niet betrokken waren bij OLTA.

Hoofdstuk 7 bevat informatie over de samenhang van betrokkenheid bij OA met gezondheidsrisico gedrag en schoolprestaties. Verder onderzochten we de mate waarin de gelijktijdige deelname in meerdere OLTA invloed had op deze verbanden. OA bleek samen te hangen met regelmatig roken, dronkenschap, ervaring met seksuele gemeenschap en slechte schoolprestaties. Deze negatieve resultaten werden niet gebufferd door gelijktijdige deelname aan OLTA. Desalniettemin hadden degenen die alleen meededen aan OA een hogere kans om betrokken te zijn in riskant gezondheidsgedrag en slechter op school te presteren dan degenen die ook deelnamen aan tenminste één OLTA.

In Hoofdstuk 8 vatten we de belangrijkste bevindingen samen uit de hoofdstukken 3-7 en bespreken ze in relatie tot de huidige stand van de wetenschap. Het hoofdstuk beschrijft ook de sterke kanten en beperkingen van het proefschrift en presenteert implicaties voor de praktijk, het beleid en het toekomstige onderzoek op basis van onze bevindingen. Jongeren die meedoen aan OLTA hebben een betere gezondheid, functioneren beter op school en zijn minder betrokken bij middelengebruik dan niet-deelnemers. Daarom bevelen wij aan de redenen voor niet-deelname te bepalen en te zoeken naar manieren om deelname aan OLTA te bevorderen onder niet-deelnemers te bevorderen en ook om manieren te vinden om deelname te behouden bij degenen die al deelnemen. OA hing daarentegen sterk samen met riskant gezondheidsgedrag en slechtere schoolprestaties. Tenslotte impliceren onze bevindingen dat OLTA een geschikte context bieden voor een gezonde jeugdontwikkeling in een Europees land, wat aansluit bij de Amerikaanse theorie over Positieve Jeugdontwikkeling. Onze bevindingen laten verder zien dat meer omvattende, uitgebreide patronen van vrijetijdsbesteding een betere verklaring bieden voor de samenhang met het gezondheidsgedrag en daarmee samenhangende uitkomsten van adolescenten.

Volný čas tvoří značnou část celkového času, jíž adolescenti disponují, přičemž způsoby jeho trávení mají značný vliv na jejich životní styl a chování související se zdravím. Účast v organizovaných aktivitách je pro adolescenty ze západních industrializovaných států relativně běžným způsobem trávení volného času. Tento druh volnočasových aktivit byl identifikován jako kontext, který umožňuje rozvoj silných stránek jedince prostřednictvím kontextuálního kapitálu (vývojových aktiv) a to navzdory skutečnosti, že běžně v nich adolescenti netráví více než 6-8 hodin týdně. Propojení silných stránek jedince a kontextuálního kapitálu dle studií podporuje zdravé dospívání a vede adolescenty na trajektorii k „ideální dospělosti“. Sociálně orientované, nestrukturované aktivity, které neprobíhají pod dohledem dospělých, jsou naopak považovány za kontext, které poskytuje adolescentům četné příležitosti pro zapojení se do rizikových či delikventních chování. Někteří adolescenti jsou přitom schopni nalézt dostatek času na oba zmíněné druhy volnočasových aktivit.

Většina z dosavadního výzkumu na volnočasové aktivity, zejména ty organizované, pochází ze Spojených států amerických či Kanady. Studie z evropských států na téma organizovaných aktivit jsou ojedinělé. Cílem této dizertační práce tedy bylo prozkoumat vztahy mezi zapojením adolescentů do organizovaných volnočasových aktivit a indikátory jejich zdraví, rizikového chování a školního výkonu v kontextu jejich rodin v evropském prostředí. K tomu byl využit rozsáhlý reprezentativní výzkumný soubor českých adolescentů. Dále, jsme se zaměřili na to, zda může zapojení do organizovaných aktivit „utlumit“ očekávané negativní dopady zapojení do sociálně orientovaných nestrukturovaných aktivit. Zároveň jsme zkoumali, zda pohlaví, věk a vzorec zapojení do organizovaných volnočasových aktivit ovlivňují vztahy s hodnocenými indikátory zdraví, rizikového chování a školního výkonu.

Kapitola 1 prezentuje teoretické koncepty a východiska týkající se volného času se hlavním zaměřením na organizované a nestrukturované volnočasové aktivity, které představují základní konstrukty této dizertační práce. V rámci této kapitoly jsou zároveň definovány hlavní cíle práce, související výzkumné otázky a teoretický model zkoumaných vztahů.

V kapitole 2 je podrobně popsán výzkumný soubor a postup sběru dat. Data od 10 503 respondentů ve věku 11, 13 a 15 let pochází ze studie Health Behaviour in School-aged Children (HBSC) realizované ve školním roce 2013/2014 v České republice. Tato kapitola zároveň obsahuje přehled použitých výzkumných nástrojů a metod statistické analýzy.

V kapitole 3 jsme zkoumali vztahy mezi třemi vybranými faktory rodinného prostředí a šancemi na zapojení do organizovaných volnočasových aktivit. Pociťovaná podpora ze strany rodiny, uplatňování pravidel omezujících dobu strávenou u obrazovky/monitoru, a tři společné rodinné aktivity (sportování, procházky a hraní společných her) provozované minimálně týdně byly spjaty s vyšší šancí adolescentů na zapojení do organizovaných volnočasových aktivit. Naopak u adolescentů, kteří s rodinou trávili svůj čas sledováním televize ve většině dní týdne, byla šance k zapojení do organizovaných volnočasových aktivit nižší.

V kapitole 4 byly představeny relativní četnosti zapojení do organizovaných volnočasových aktivit a zároveň prozkoumány převládající vzorce zapojení do těchto aktivit. Adolescenti zapojení do organizovaných aktivit častěji uváděli vynikající zdraví a vysokou úroveň životní spokojenosti než ti, kteří do takových aktivit zapojení nebyli. Tyto vztahy byly pozorovány nezávisle na pohlaví a věku respondentů či konkrétního vzorce zapojení do organizovaných aktivit. Účast na týmových anebo individuálních sportovních aktivitách byly ovšem spojena s lepším hodnocením zdraví a nižším výskytem zdravotních komplikací u chlapců než u dívek. Dívky naopak hodnotily své zdraví lépe než chlapci, pokud se účastnily uměleckých činností.

Vztahy mezi zapojením do organizovaných aktivit a užívání návykových látek, násilným chováním, zraněními a záškoláctvím byly hodnoceny v kapitole 5. Účast na organizovaných volnočasových aktivitách byla spojena s nižší šancí na pravidelné kouření, opakovanou opilost, a chozením za školu. Účastníci volnočasových aktivit byli na druhou stranu častěji zranění a opakovaně se zapojovali do fyzických bitek. Adolescenti účastníci se uměleckých aktivit (samotných či v kombinaci s organizovanými sporty) uváděli konzistentně nejnižší úroveň rizikového chování napříč zkoumanými závisle proměnnými. Ve srovnání s chlapci byly dívky účastníci se organizovaných aktivit méně často zapojeny do všech forem rizikového chování.

V kapitole 6 jsme hodnotili vztahy mezi účastí na organizovaných volnočasových aktivitách a školním výkonem adolescentů. Adolescenti zapojení do organizovaných aktivit měli oproti těm nezapojeným vyšší šanci hodnotit svůj vztah ke škole kladně a své školní výsledky jako nadprůměrné. Zároveň uváděli nižší míru subjektivně pociťovaného stresu ze školních povinností. Tato zjištění zůstala v platnosti i po zahrnutí kontrolních proměnných pohlaví, věk a socioekonomický status. Silnější vztahy s lepším školním výkonem byly pozorovány u adolescentů zapojených souběžně do vícerych typů organizovaných aktivit než u adolescentů účastnících se pouze organizovaných sportů. Tito však stále uváděli lepší školní výkon než adolescenti, kteří se žádných organizovaných aktivit neúčastnili.

Kapitola 7 prezentuje údaje o vztazích zapojení do nestrukturovaných volnočasových aktivit s rizikovým chováním a školním výkonem. Dále bylo hodnoceno, do jaké míry souběžná účast na organizovaných aktivitách tyto vztahy ovlivňuje. Zapojení do nestrukturovaných aktivit bylo spojeno s vyšším rizikem výskytu pravidelného kouření, opilosti, zkušenosti se sexuálním stykem a podprůměrným školním výkonem. Souběžná účast na organizovaných volnočasových aktivitách tyto negativní dopady nestrukturovaných aktivit netlumila, s výjimkou zkušenosti se sexuálním stykem. Avšak u adolescentů, kteří byli zapojeni pouze do nestrukturovaných aktivit, jsme pozorovali vyšší výskyt rizikového chování a slabší školní výkon ve srovnání s adolescenty, kteří se souběžně účastnili alespoň jedné organizované aktivity.

V kapitole 8 jsou shrnuta klíčová zjištění z kapitol 3-7 a diskutována v kontextu dosavadního vědeckého výzkumu. Tato kapitola zároveň obsahuje popis silných stránek dizertační práce a jejích limitací. Dále jsou zde nastíněny možné implikace pro praxi, politiku i budoucí výzkum v této oblasti, které byly formulované na základě zjištění prezentovaných v této práci. Adolescenti zapojení do organizovaných volnočasových aktivit hodnotili své zdraví a školní výkon lépe než adolescenti, kteří se žádných organizovaných aktivit neúčastnili. Míra užívání návykových látek byla naopak u účastníků organizovaných aktivit oproti neúčastníkům nižší. Z tohoto důvodu do budoucna doporučujeme identifikovat možné příčiny neúčasti na organizovaných aktivitách, usilovat o nalezení způsobů, jak ty, kteří se neúčastní, do organizovaných aktivit zapojit, a rovněž způsobů, jak udržet účastníky nadále zapojené. Nestrukturované aktivity byly naopak silně spjaty s vyšším výskytem rizikového chování a slabším školním výkonem. Naše výsledky tedy v souladu s americkou teorií Pozitivního vývoje mládeže naznačují, že organizované volnočasové aktivity jsou kontextem, který je vhodný pro zdravý vývoj adolescentů i v evropském státě. Prezentovaná zjištění dále nasvědčují tomu, že sledování komplexnějších vzorců zapojení do volnočasových aktivit by mohlo napomoci objasňování vztahů se zdravím a školním výkonem adolescentů.

## Acknowledgements

I would hereby like to express my gratitude to all the people who helped me over the last four years to reach the end of my PhD quest. This work could hardly have been accomplished without them and their input, help, support and friendship. I sincerely appreciate it very much.

I would like to thank to all nice people from the University Medical Centre Groningen whom I had the opportunity to meet during my stays there, especially to my supervisors: *Prof. Sijmen A. Reijneveld*, for sharing his vast professional knowledge and scientific experience and expanding my narrow horizons. I feel really honoured for being given a chance to cooperate and be led by him; and *Assoc. Prof. Jitse P. van Dijk*, for his caring attitude and efforts put into bringing cooperation with my 'alma mater' to life and enabling my studies to be official. Furthermore, I would like to thank to *Prof. dr. A. Dijkstra*, *Prof. dr. M. Janura* and *Prof. dr. C. P. van der Schans* – members of the Assessment Committee – for the time spent assessing my dissertation.

I am also truly grateful to the Slovak team from Safarik University in Kosice. In particular, to *Prof. Andrea Madarasová Gecková*, for her brilliant supervision and guidance throughout the journey and believing in my abilities, even at times when I did not believe in them at all, and to *Dr. Danka Fil'akovská Bobáková*, who was actually the one who approached me with the question: 'Hey Petr, wouldn't you like to try studying PhD in Groningen?' My thanks must also be given to the rest of the Kosice crew, including *Andrej Belak*, *Ivanka Borysova*, *Dr. Lucka Bosakova*, *Dr. Janka Holubcikova*, *Dr. Danka Husarova Brindova*, *Dr. Peter Kolarcik*, *Jarka Kopcakova* and all others who made my frequent travels to Kosice a great experience and even made me look forward to them, despite my aversion towards travelling and meeting new people. I don't want to forget *Dr. Daniel Klein* for his assistance with statistical tasks that were unsolvable for me, and *David McLean* for making my English sound a bit more natural and comprehensible.

I also feel the need to thank many great people from Olomouc who supported me and created productive, yet entertaining and fulfilling, working conditions for me: *Prof. Karel Frömel*, *Dr. Zdenek Hamrik*, *Vlád'a Hobza*, *Dr. Michal Kalman*, *Dr. Honza Pavelka*, *Zuzka Půžová*, *Assoc. Prof. Erik Sigmund*, *Assoc. Prof. Dagmar Sigmundová*, *Jana Vokáčová* and many others. It has been my pleasure to cooperate with you, and I hope it will continue for some time.

Finally, I would like to thank the key people in my life – my family – as without them I would have never ever found enough willpower to finish my quest. A great thanks go to my parents for standing by me as long as I can remember (and likely also beforehand). I do not take that for granted. Last, but certainly not least, I have to thank my wife *Bára* and my kids *Julie* and *Robin* for giving my life true meaning and being so empathic and patient with me. I love you all.



## About the author

Petr Baďura was born on 29 August 1986 in Olomouc, Czech Republic, then moved to a small hamlet before ending up back in Olomouc for his Ph.D. studies. However, his entire education is connected to Olomouc. Upon finishing secondary school, he studied at the Faculty of Physical Culture, Palacký University Olomouc, and graduated in Recreation and Leisure Studies in 2013. His diploma thesis was titled 'CAPE & PAC, SOPARC, SOPLAY and SPACES tools and options of their use for research purposes in the Czech Republic'. This master thesis dealt with localisation and adaptation of the mentioned research instruments investigating infrastructure for leisure-time physical activity and participation, enjoyment and preferences of leisure-time activities in children in the Czech environment. During his studies he worked as a translator, English teacher and ski instructor for adults and children. After completing his university studies, he operated a small business providing language services and, in the meantime, started cooperating on research projects at Palacký University. In September 2014, he entered the double-degree PhD program at Palacký University Olomouc in collaboration with the University of Groningen.

His research focuses on leisure time use in adolescents and school-aged children, with special emphasis on participation in organized leisure-time activities and assumed outcomes of such participation. He has also been taking part in several research projects funded by the Czech Science Foundation and Ministry of Education, Youth and Sports of the Czech Republic, investigating physical activity, sedentary behaviours, their correlates and determinants in adolescents and families with children of various ages. In 2014 he became a member of the Czech national team of the Health Behaviour in School-aged Children (HBSC) study and a member of its Physical activity focus group. Since 2016 he has acted as a chair of the HBSC Leisure conceptual group responsible for expanding the scope of the HBSC study to cover the topic of leisure time. At present, he works as a researcher at the Institute of Active Lifestyle and Department of Recreation and Leisure Studies, Faculty of Physical Culture, Palacký University Olomouc.



## Groningen Graduate School of Medical Sciences - Research Institute SHARE and previous dissertations

This thesis is published within the Research Institute SHARE (Science in Healthy Ageing and healthcaRE) of the University Medical Center Groningen / University of Groningen. Further information regarding the institute and its research can be obtained from our internet site: <http://www.share.umcg.nl/>

More recent theses can be found in the list below.  
((co-) supervisors are between brackets)

2018

Zakiyah N  
Women's health from a global economic perspective  
(*prof MJ Postma, dr ADI van Asselt*)

Metting, EI  
Development of patient centered management of asthma and COPD in primary care  
(*prof T van der Molen, prof R Sanderman, dr JWH Kocks*)

Suhoyo Y  
Feedback during clerkships: the role of culture  
(*prof JBM Kuks, prof J Cohen-Schotanus, dr J Schönrock-Adema*)

Veen HC van der  
Articulation issues in total hip arthroplasty  
(*prof SK Bulstra, dr JJAM van Raay, dr IHF Reininga, dr I van den Akker-Scheek*)

Eisenburg LK  
Adverse life events and overweight in childhood, adolescence and young adulthood  
(*prof AC Liefbroer, dr N Smidt*)

't Hoen EFM  
Practical applications of the flexibilities of the agreement on trade-related aspects of intellectual property rights; lessons beyond HIV for access to new essential medicines  
(*prof HV Hogerzeil, prof BCA Toebes*)

Stojanovska V  
Fetal programming in pregnancy-associated disorders; studies in novel preclinical models  
(*prof SA Scherjon, dr T Plösch*)

Eersel MEA van  
The association of cognitive performance with vascular risk factors across adult life span  
(*prof JPJ Slaets, dr GJ Izaks, dr JMH Joosten*)

Rolfes L  
Patient participation in pharmacovigilance  
(*prof EP van Puijenbroek, prof K Taxis, dr FPAM van Hunsel*)



Brandenburg D

The role of the general practitioner in the care for patients with colorectal cancer  
(*prof MY Berger, prof GH de Bock, dr AJ Berendsen*)

Oldenkamp M

Caregiving experiences of informal caregivers; the importance of characteristics of the informal caregiver, care recipient, and care situation  
(*prof RP Stolk, prof M Hagedoorn, prof RPM Wittek, dr N Smidt*)

Kammen K van

Neuromuscular control of Lokomat guided gait; evaluation of training parameters  
(*prof LHV van der Woude, dr A den Otter, dr AM Boonstra, dr HA Reinders-Messelink*)

Hornman J

Stability of development and behavior of preterm children  
(*prof SA Reijneveld, prof AF Bos, dr A de Winter*)

Vries, YA de

Evidence-b(i)ased psychiatry  
(*prof P de Jonge, dr AM Roest*)

Smits KPJ

Quality of prescribing in chronic kidney disease and type 2 diabetes  
(*prof P denig, prof GJ Navis, prof HJG Bilo, dr GA Sidorenkov*)

Zhan Z

Evaluation and analysis of stepped wedge designs; application to colorectal cancer follow-up  
(*prof GH de Bock, prof ER van den Heuvel*)

Hoeve Y ten

From student nurse to nurse professional  
(*prof PF Roodbol, prof S Castelein, dr GJ Jansen, dr ES Kunnen*)

Ciere Y

Living with chronic headache  
(*prof R Sanderman, dr A Visser, dr J Fleer*)

Borkulo CD van

Symptom network models in depression research; from methodological exploration to clinical application  
(*prof R Schoevers, prof D Borsboom, dr L Boschloo, dr LJ Waldorp*)

For more 2018 and earlier theses visit our website



ISBN 978-94-034-0844-6 (printed version)  
ISBN 978-94-034-0843-9 (digital version)