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A school excursion to a museum can promote physical activity in children by integrating movement into curricular activities

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Abstract

Since children spend a large proportion of their time in institutional settings such as schools, health promotion researchers have identified this as an important setting to promote physical activity (PA). Apart from physical education, PA could be integrated into the school curriculum in other ways. Therefore, the aim of this study was to examine whether a school excursion to a museum can increase primary school students' PA and reduce sedentary time. One hundred and ten primary school students aged 12–13, from three Danish schools, wore accelerometers for four consecutive days, of which one consisted of an excursion day to a museum. While an increase in light physical activity and reduction in the amount of sedentary time was observed, students did not spend more time in moderate to vigorous PA (MVPA) during the visit to the museum than on a regular school day. However, over the full excursion day, the students accumulated more MVPA. One school used active transportation to and from the museum, which contributed to significantly more MVPA compared to the other

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schools. An excursion to a museum significantly reduced sedentary time, but was in itself not sufficient to increase MVPA.

Keywords
Active living, health promoting environments, sedentary behaviour, youth

Introduction

Globally, many adults and children are insufficiently physically active to sustain good health (Hallal et al., 2012), and physical inactivity is recognized as the fourth leading risk factor for global mortality (World Health Organization, 2011). Physical activity (PA) appears to influence children's cognitive performance (Rasberry et al., 2011) and mental well-being through promoting self-esteem and preventing the development of anxiety and depression (Biddle and Asare, 2011). Furthermore, studies show a consistent negative association between sedentary behaviour and mental health (Biddle and Asare, 2011). High levels of sedentary time among youth worldwide (Pate et al., 2011) and emerging evidence for an association between sedentary behaviours and obesity and metabolic risks, independently of PA (Cliff et al., 2016; Liao et al., 2014), adds to the urgency of promoting PA and reducing sedentary time. The importance of promoting children's PA and reducing sedentary behaviours is furthermore underpinned by studies suggesting that childhood PA tracks into later life (Herman et al., 2009; Kristensen et al., 2008; Telama, 2009).

As children in developed countries spend approximately one third of their time in school for nine months per year (World Health Organization, 2004), and children from all socio-economic and cultural backgrounds can be reached (Nielsen et al., 2011a), the school has been identified as an essential setting for the promotion of PA (Guinhouya et al., 2009; Strong et al., 2005). Furthermore, promotion of PA in a school setting has the potential to engage the approximately 25% of children who have no or little interest in recreational sports and PA (Mygind, 2007) and are in particular risk of performing too little PA.

There exists a variety of school-based PA promotion initiatives including, for example, PA breaks during the school day, supplementary physical education (PE) lessons and supporting active play during recess through provision of equipment, PA homework, or special events at weekends (Dobbins et al., 2013; Kriemler et al., 2011). Amongst Danish third graders, recess contributed to almost 25% of 9–10-year-old boys' and 20% of girls' daily measured moderate to vigorous PA (MVPA) (Nielsen et al., 2011b). Furthermore, school PE was found to account for about 20% of the boys' and 17% of girls' daily measured MVPA in Danish third graders (Nielsen et al., 2011b). Although PE classes and recess are obvious settings for PA and contribute to children's daily MVPA, a worldwide tendency towards limiting the number of PE classes to make room for more academic education has been observed (Hardman et al., 2014; Marshall and Hardman, 2000).

School-based initiatives to promote PA are often extra-curricular activities to schools' and teachers' core objectives and everyday practice (Simovska et al., 2016). School-based PA promotion activities often add to already full schedules and are therefore often experienced as an extra responsibility or even a burden, an 'add-on' in other words. Being an 'add-on' to a wealth of existing teaching obligations might impede implementation of school-based PA promotion activities (Simovska et al., 2016), and in turn explain why outcomes of school-based PA interventions are observed to be mixed (Pucher et al., 2013). Integrating PA into curricular activities in

such a way that it is experienced as an 'add-in', rather than an 'add-on', by teachers and students could facilitate successful implementation of PA promotion activities.

Education outside the classroom (EOtC) (Bentsen et al., 2009, 2010; Jordet, 2010) might provide such an add-in, where PA is an integral part of learning activities (see Norris et al. (2015) for a review of other studies that have explored the potential of physically active lessons to promote school-based PA). EOtC implies a practice of recurring excursions or other forms of teaching outside the regular classroom in which curriculum-based learning takes place. Settings outside the school, such as aquariums, forests, graveyards, green spaces, museums, playgrounds, and zoos, are used as settings for learning (Bentsen et al., 2010). While acknowledging the differences between the various types of institutions, in this article, we refer to *museum* as an overarching term for aquariums, children's museums, science centres, and science museums. The typical aim and function of EOtC is to make use of an environment to teach often abstract academic concepts and skills in a more concrete and illustrative way (Bentsen and Jensen, 2012). As a consequence, bodily activities and movement are often automatically involved. Furthermore, EOtC, as a mode of active learning that requires equally active participation from all students, has the potential to supersede socially and culturally bound differences in PA, for example the well-established gap in levels of PA between boys and girls (Telford et al., 2016).

While there is some evidence that supports the theory that children accumulate more PA during EOtC in natural environments compared to a regular school day in the classroom (Grønningsæter et al., 2007; Mygind, 2007), to our knowledge, no studies have explored the potential of school excursions to museums to increase PA and reduce sedentary time during school hours. This type of learning activity is a common and growing practice in Denmark (Skoletjenesten, 2015) and may provide an easily applied add-in with the potential to increase PA levels. Therefore, we investigate whether integrating PA into curriculum-based teaching on a school excursion to a museum can contribute to students reaching higher levels of MVPA and decreasing sedentary time. Anecdotal evidence from museum practitioners indicates that children are physically active when visiting museums. This directs our expectation for students to be more physically active during an excursion day to a museum compared to an ordinary school day. We therefore investigate the following two hypotheses:

1. Students accumulate more MVPA on an excursion day to a museum than on a typical school day.
2. Students spend less time sedentary on an excursion day to a museum than on a typical school day.

Methods

This paper builds on a quasi-experimental study design where we provided three schools with a free excursion to a science museum to compare the difference in MVPA, light physical activity (LPA), and sedentary time.

Setting

Experimentarium is a science centre located in Copenhagen, Denmark (www.experimentarium.dk/). In 2014, almost 200,000 people visited the museum. Target groups are families and school classes. In 2017, entrance costs 185 DKK for adults and 105 DKK for children under the age of 12. Schools are offered a special school subscription (cost 25 DKK) with a fee of 50 DKK per visiting student. The museum houses a permanent exhibition and at least two temporary exhibitions

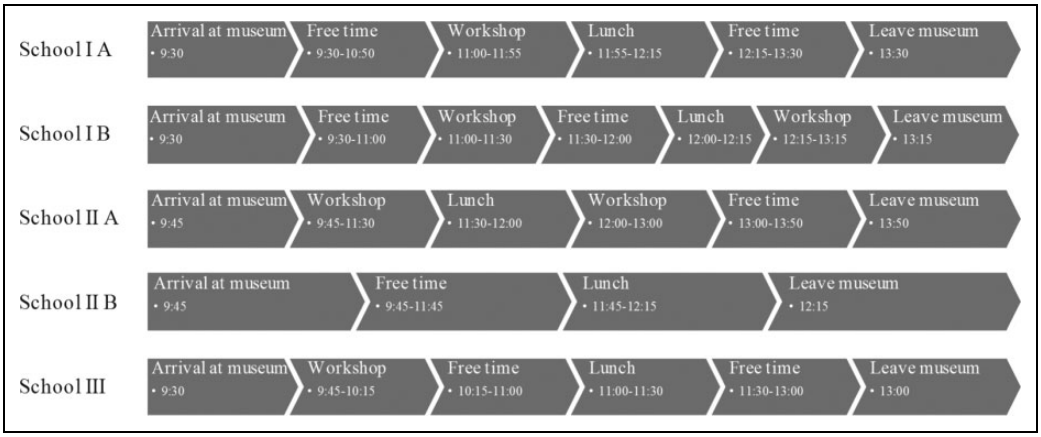

Figure 1. Timetables of activities during the museum visits.

every year. The exhibition space covers 5000 square metres located on two floors. The ground floor consists of a series of relatively narrow rooms, but the first floor has an open-plan layout that allows visitors to choose their own path, and it is possible to run or walk freely from exhibit to exhibit. Figure 1 illustrates the content and structure of the individual school classes' visits to the museum.

Participants

Ten schools located in the vicinity of the museum had booked a visit with the museum. These schools were invited to participate in the study and offered free entrance to the museum as an incentive to partake. Seven schools responded positively and three of the schools were selected to participate, based on the following inclusion criteria: (a) that they planned to have a visit with at least one hour for free play; and (b) the students across the schools were of the same age. Schools I and III were located in relatively affluent communities, whereas School II was located in a more deprived area. This was assessed in reference to existing governmental reports on demographic variables concerning average household income, unemployment, education level, and ratio of non-western citizens at the community level (Region Sjælland, 2013).

At these three schools, 179 students attending 6th grade (aged 12–13) were invited to participate and their parents were asked to sign an informed consent form allowing their children to participate. Thirty-five students were excluded as they: (a) did not want to participate ($n = 18$); (b) were sick or on holiday on the day the researchers distributed the accelerometers to the class ($n = 5$); (c) moved to another school or were abroad during the five days of data collection ($n = 3$); or (d) did not provide parental consent for participation ($n = 9$). In total, 144 students were included in the study and asked to wear accelerometers for at least four school days. Students with insufficient accelerometer data ($n = 34$) were excluded from the sample, resulting in a final sample of 110 students. Accelerometer data criteria are elaborated in the following section.

Instrumentation

Accelerometer measurements. Data were recorded as an activity-count every 15 seconds using the ActiGraph accelerometer model GT3X. The ActiGraph accelerometer has previously been

recognized as providing acceptable validity and reliability for measuring children's activity levels (Reilly et al., 2008; Rowlands, 2007). PA was considered moderate to vigorous when above 574 counts per epoch (i.e. 2296 counts/minute) and sedentary when below 25 counts per epoch (Evenson et al., 2008; Trost et al., 2011). PA was considered light in the interval ranging from 25 to 574 counts per epoch. Continuous periods of at least 60 minutes of zero values were classified as non-wear time (Nielsen and Schipperijn, 2013), and removed.

The accelerometer data was compiled into a PostgreSQL database and combined with data from class timetables. In the database, school time was calculated for each participant based on the class timetables. Transport to and time spent at the museum was estimated in the database based on the time slots noted by the researchers.

Three outcome variables were created: (1) the proportion of time spent in MVPA; (2) the proportion of time spent in LPA; and (3) the proportion of time spent sedentary. The outcome variables were divided into six domains: (1) the full day of regular school, i.e. during school hours and before and after; (2) during a regular school day, i.e. during school hours; (3) the full day of the excursion, i.e. while at the museum and before and after; (4) the full excursion, i.e. the visit to the museum and transport to and from the museum from the respective schools; (5) during the visit to the museum, i.e. while at the museum; and (6) during transport to and from the museum.

Questionnaire. Our survey was based on questions used in the Danish version of the Health Behavior In School-Aged Children (HBSC) study (Rasmussen et al., 2015). The questionnaire contained questions regarding sex, BMI (as a binary variable based on self-reported weight and height: a BMI > 25 was considered overweight (Cole et al., 2000)), employment status of parents or legal guardians[1] (categorical variable: both parents are working, only mother is working, only father is working, or neither mother nor father are working), language spoken at home (binary variable: only Danish or Danish and one or more other languages), and leisure time PA (binary variable: yes or no).

Procedure

Questionnaires were completed by the students upon the first visit to the schools. We instructed participants to wear the accelerometers on their hip (Reilly et al., 2008; Rowlands, 2007) for a minimum of four full days (including before and after school and the excursion) during waking hours, and to remove them only for bathing or water sports. We required valid accelerometer measurements from at least one regular school day and the excursion day, with a minimum of nine hours of accelerometer wear time. Measurements from 34 students were excluded as they did not meet our predetermined inclusion criteria, which led to 110 students being included in the analyses.

Data analysis

No severe deviation from normality was identified by the means of P–P plots, histograms, and the Shapiro–Wilk test.

Univariate analyses were performed using an χ^2-test to examine differences between students with sufficient accelerometer data and students with missing data. Furthermore, we used paired sample *t*-tests to test differences in MVPA and sedentary time between the different domains. Lastly, we applied the Bonferroni and Least Significant Difference (LSD) method to investigate if

Table 1. Descriptive characteristics of study participants (frequencies, proportion, mean, and standard deviation).

	Girls	Boys
Population (%)	61 (55.5)	49 (44.5)
Mean BMI (SD)	17.3 (2.3)	18.3 (2.4)
Employment status of parents (%)[a]		
Both parents employed	52 (85.2)	34 (69.4)
One or both parents unemployed	9 (14.8)	13 (26.5)
Language at home (%)		
Danish	59 (96.7)	47 (95.9)
Other	2 (3.3)	2 (4.1)

[a]Data missing from two participants.

there were school-related differences in MVPA and sedentary behaviour. All analyses were performed using SPSS.

Participants' approval statement

The study was approved by the Danish Data Protection Agency and rules regarding data security and anonymization were followed (j. nr. 2014-54-0638). The study was granted an exemption from requiring ethics approval by the Regional Scientific Ethical Committees for The Capital Region of Denmark. All parents provided a signed consent statement allowing their children to participate.

Results

We found no statistical difference in distribution of sex ($p = 0.057$), self-reported BMI ($p = 0.612$), employment status of parents ($p = 0.910$), or domestic language ($p = 0.499$) between students who were included in and excluded from the final sample. Table 1 summarizes the descriptive characteristics of the study participants.

Figure 1 illustrates the various visits to the museum and the activities in which the students participated. As illustrated by the figure, the visits varied in length, which explains why the following presentation of the results focuses particularly on proportions of MVPA, LPA, and sedentary time rather than absolute numbers.

Did the students engage in more PA on the museum excursion day than on a regular school day?

Based on a simple comparison (see Figure 2) of the students' accumulated MVPA while (a) at the museum (31.5%) and (b) at the schools (45.1%), it appears that the museum visit alone does not result in a larger contribution to the day's mean MVPA. However, comparing the full excursion ($31.5\% + 23.3\% = 54.8\%$), i.e. including transport to and from the museum, to the regular school day appears to result in a comparatively higher contribution to the accumulated MVPA.

Table 2 lists MVPA, LPA, and sedentary time across: (a) the full day of excursion; (b) the full day of regular school; (c) during the excursion; (d) during school hours; and (e) while at the museum, in minutes and as percentages of the summed activity in the domain ($n = 110$).

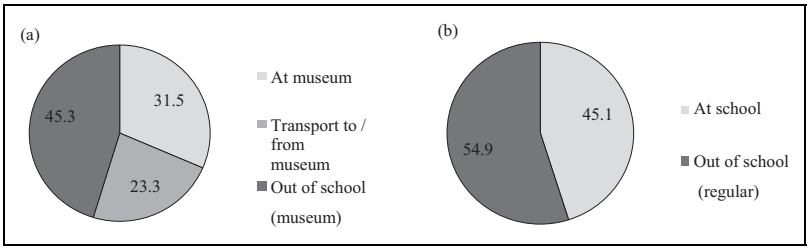

Figure 2. Contribution of MVPA in domains to accumulated MVPA throughout museum and regular school days.

Table 2. Moderate to vigorous physical activity (MVPA), light physical activity (LPA), and sedentary time: proportion (% of wear time in domain) and absolute numbers (minutes) of measured activity in domain.

All ($n = 110$)		Day of excursion (a)	Day of regular school (b)	During excursion (I)	During school hours (II)	At museum (III)
Sedentary	%	62.29	64.36[a]	57.46[III]	63.01[I+III]	52.94
	min	*(500.8)*	*(515.1)*	*(205.8)*[III]	*(201.2)*[III]	*(111.3)*
LPA	%	30.73[b]	28.78	34.15[II]	29.46	39.13[I+II]
	min	*(245.6)*[b]	*(230.3)*	*(121)*[II+III]	*(93.6)*[III]	*(77.1)*
MVPA	%	6.98	6.86	8.39	7.53	7.93
	min	*(55.3)*	*(54.8)*	*(29.0)*[II+III]	*(24.4)*[III]	*(16.4)*

For each significantly different pair ($p < 0.05$), the key of the smaller category appears under the category with the larger mean. Significance tests are based on two-sided tests assuming equal variances.

There was no difference in proportions of MVPA accumulated over the full day of the excursion (7.0%, SD: 3.5) and the full day of regular school (6.9%, SD: 2.84, $p = 0.734$). Furthermore, there was no significant difference in the proportion of time the students spent in MVPA during their visit to the museum (7.9%, SD: 4.25) compared to regular school hours (7.5%, SD: 3.68, $p = 0.395$). In absolute measures, the children spent more minutes in MVPA during regular school hours (24.4 min, SD: 12.28) than while at the museum (16.4 min, SD: 9.39, $p < 0.05$), but significantly more time in MVPA was accumulated over the full excursion (29.0 min, SD: 15.52, $p < 0.05$), i.e. when including transportation. However, there was no significant difference in proportions of accumulated MVPA over the full excursion (8.4%, SD: 4.75), i.e. when including the transportation, compared to regular school hours (7.5%, SD: 3.68, $p = 0.105$).

Over the full day of the excursion, the students accumulated higher proportions of LPA (30.7%, SD: 5.35) than on a full day of regular school (28.8%, SD: 4.9, $p < 0.001$). Higher proportions of LPA were measured both during the visit at the museum (39.1%, SD: 10.06) and during the full excursion (34.2%, SD: 6.14), i.e. including transportation, than during regular school hours (29.5%, SD: 6.08, $p < 0.001$). Consequently, the students also spent a significantly smaller proportion of their time sedentary throughout the full day of the excursion (62.3%, SD: 7.0) compared to a regular day of school (64.4%, SD: 6.34, $p < 0.05$). Furthermore, the proportions of sedentary time were lower during the visit at the museum (52.9%, SD: 11.53) and during the full excursion (57.5%, SD: 8.31), i.e. including transportation, than during regular school hours (63.0%, SD: 7.09, $p < 0.001$).

Sex and proportions of PA

The boys spent a significantly larger proportion of time in MVPA compared to the girls in most domains: (a) the full day of regular school (boys 7.6%, SD: 3.22; girls 6.3%, SD: 2.38); (b) during regular school hours (boys 8.6%, SD: 4.27; girls 7.5%, SD: 2.88); (c) the full day of excursion (boys 8.0%, SD: 3.45; girls 6.2%, SD: 3.33); (d) during the full excursion, i.e. including transportation (boys 9.5%, SD: 4.75; girls 7.5%, SD: 4.60); and (e) during the visit to the museum (boys 9.5%, SD: 4.57; girls 6.7%, SD: 3.52, $p < 0.05$). Only during transportation to and from the museum were no differences in accumulated MVPA observed (boys 9.3%, SD: 7.93; girls 8.9%, SD: 8.85, $p>0.05$). Likewise, the boys accumulated larger proportions of LPA while visiting the museum (boys 41.6%, SD: 10.53; girls 37.1%, SD: 9.28, $p < 0.05$) and during the excursion (boys 35.9%, SD: 6.06; girls 32.8%, SD: 5.89, $p < 0.05$), i.e. including transportation. Otherwise, in terms of LPA, no significant differences between the sexes were found in the other domains.

The girls spent more time sedentary during the excursion (boys 54.7%, SD: 7.84; girls 59.7%, SD: 8.04, $p < 0.05$), during regular school hours (boys 61.4%, SD: 7.01; girls 64.3%, SD: 6.93, $p < 0.05$) and while visiting the museum (boys 48.9%, SD: 12.05; girls 56.2%, SD: 10.05, $p < 0.05$). Over the full day of the excursion (boys 60.9%, SD: 5.96; girls 63.4%, SD: 7.59, $p > 0.05$) and regular school (boys 64.2%, SD: 6.65; girls 64.5%, SD: 6.13, $p > 0.05$), the boys and girls spent similar proportions of time sedentary.

Schools and proportions of PA

The students from School I spent significantly higher proportions of time in MVPA during the excursion (12.5%, SD: 4.88), that is, including transportation time, compared to the other schools (School II 5.7%, SD: 2.1; School III 7.8%, SD: 4.38). This difference could also be identified in the MVPA on the full day of the excursion (School I 8.6%, SD: 4.01, School II 6.0%, SD: 3.14, School III 6.6%, SD: 2.74, $p < 0.05$). Likewise, School I accumulated more LPA than School II and III during transport to the museum (School I 35.0%, SD: 7.27; School II 27.0%, SD: 7.99; School III 28.3%, SD: 9.54, $p < 0.05$) and less sedentary time (School I 46.4%, SD: 5.92; School II 67.9%, SD: 8.66; School III 67.4%, SD: 12.16, $p < 0.05$). While the students from School II and III took public transportation directly to the museum, the students from School I walked from a train station located 2.4 kilometres from the museum. This explains the pronounced difference in the proportion of MVPA, LPA, and sedentary time during transport to and from the museum in School I as compared to the other schools.

Discussion

Importance and contributions of the findings

Contrary to our hypotheses, our results indicate that time spent at a museum was not in itself sufficient to enhance levels of MVPA compared to a regular school day. In absolute time, the students accumulated higher levels of MVPA over the full course of the excursion, i.e. when including transport to and from the museum. Moreover, the students engaged in significantly more LPA and were less sedentary on an excursion day, compared to a regular school day.

There is some evidence that school-based interventions have previously had a positive influence on children's PA: a combination of printed educational materials and integrating PA into the school curriculum appears to contribute to higher levels of PA amongst children (for a review, see

Dobbins et al., 2013). The present intervention did not include educational materials. However, the PA-integrated curriculum appeared to influence levels of LPA positively, although MVPA remained unchanged.

Lower levels of sedentary time have been proven to be an indicator of increased health, independent of MVPA (Katzmarzyk, 2010). In a recent review of the existing experimental studies on health effects of breaks in sitting time, Benatti and Ried-Larsen (2015) concluded that replacing sedentary time with light-intensity PA appeared to induce favourable metabolic changes, at least in people who are physically inactive and/or have type-two diabetes. In other words, the effects of breaking up prolonged sedentary time in physically active individuals is subject to discussion; in young, habitually physically active individuals, higher intensity or volume seems to be more effective in rendering positive outcomes (Benatti and Ried-Larsen, 2015). Consequently, it is uncertain whether the students in our study, most of whom are between the fifth percentile to less than the 85th percentile on the BMI-for-age chart (Centers for Disease Control and Prevention, 2015), would achieve health benefits by reducing sedentary time. However, for children who are insufficiently physically active, integrating light-intensity movement in the curriculum through excursions to museums might contribute positively to overall PA. Furthermore, interventions aimed at decreasing amounts of sedentary time amongst children have previously reduced BMI amongst non-obese children to a magnitude that might have public health significance, on a population level (for a review see Liao et al., 2014).

Using a museum for learning activities appears to be a practice that accumulates more PA than a regular school day. While a single or sporadically occurring excursion is unlikely to have substantial health benefits, our findings suggest that using cultural institutions, such as museums, holds potential to integrating low-intensity PA into curriculum-based learning activities. In Denmark, EOtC appears to be feasible nationwide, as this practice is already commonly used and spreading in Danish schools (Barfod et al., 2016; Bentsen et al., 2010). EOtC involves moving learning activities outside the classroom on a biweekly basis, at the minimum. If learning activities in cultural institutions are combined with other regularly occurring excursions, as is practised in EOtC, or other forms of physically active lessons based in the classroom (Norris et al., 2015), it is likely that overall PA levels are influenced and that this will have positive health outcomes.

We expected the children to be more physically active at a museum due to the relative freedom of movement compared to the regular school setting and anecdotal evidence from the museum staff. However, it is possible the activities at the museum stimulated more low-intensity PA, rather than MVPA, compared to sedentary behaviour in regular school settings. Furthermore, it is possible that the children included in this study were of an age (12–13) where running from exhibit to exhibit (that is, playing) was no longer socially acceptable (Mulvihill et al., 2000).

Strengths and limitations

We have investigated, using accelerometers, Danish students' MVPA, LPA, and sedentary time on a regular school day compared to an excursion day to a museum environment. The accelerometers were placed children's hips. This provides highly accurate information about the levels of running and walking in a manner that surpasses, for example, intentional response bias related to self-report (Reilly et al., 2008). While the accelerometers offer a valid approach for measuring running and walking, static or isometric work in which there are no horizontal or vertical movements are not measured. Some of the exhibits at the museum are of this kind; one exhibit, for example, simulates a rowing machine. In another exhibit, the children weigh or lift objects, both of which are activities

that are not sedentary, but may be registered as such. These kinds of activities differ from activities available during a typical school day, and would indicate the possibility of underestimating the difference in PA. Combining the accelerometer measurements with, for example, heart rate monitors might circumvent this issue.

In order to achieve a high level of compliance, we included the first day of accelerometer measurement, although it is possible the students will be more physically active on the first day of measurement than they had normally been, i.e. the 'Hawthorne effect' (Nielsen and Schipperijn, 2013). In all cases, the first day of measurement took place at school, where the researchers instructed the students and handed out accelerometers. Thus, it is possible that school-based MVPA may have been overestimated. Consequentially, we might have underestimated the difference between proportion of time spent in MVPA in the school and on the excursion day.

In order to ensure comparability between the recruited schools' visits, one of our inclusion criteria was a minimum of one hour for free play (as can be seen from Figure 1, most of the classes had reserved approximately two hours for free play during the visits). On one hand, it is possible that other school classes planning for less time for free play would engage in less PA than the school classes participating in the present study. On the other hand, school classes reserving more time for free play would be more physically active. However, visits at the museum will most often involve some measure of free time since the museum is designed for relatively undirected exploration.

Conclusions

Using accelerometers, we explored the effects of a school excursion to a museum on primary school students' PA during school hours. Our results indicate that the time spent at the museum is in itself not sufficient to enhance levels of MVPA during school hours. However, an increase in LPA and decrease in sedentary time during the excursion to the museum was observed. This might hold health promoting promise, especially for children who are habitually insufficiently physically active. Still, further research on the influence of sedentary time on children's health is needed to understand the impact of the observed decrease in sedentary time.

Future research

Future research should investigate relations between different teaching and learning settings and PA; will an arts museum, for example, afford the same possibilities for LPA as the science museum explored in the current study? Furthermore, future studies should approach intersectional differences in the use of the teaching and learning settings that in turn might influence PA. It is, for example, possible that younger children use the space differently than the 12–13-year-olds of this study. While our study was largely descriptive, there is a need for experimental research designs involving interventions and control groups for assessing causality.

Implications for practice

We have identified several issues that may be relevant for school health policy and practice. Firstly, it seems that school excursions to museums can integrating movement into curriculum-based activities as an add-in activity. Secondly, active transportation to and from external learning settings, such as museums, is an easily applied and cheap modality for enhancing students', and

probably also teachers', daily PA. Integrating this into school policies might raise awareness in teachers' everyday practice for planning excursions. A third recommendation and potential direction for school excursions, physical activity, and health could be a focus on more inclusive practices for both sexes.

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Note

1. Two assistants were present while the children filled out the questionnaires. In the cases where children did not have a biological mother or father, the assistants explained that they should fill out the employment status of their legal guardian instead. We encountered no instances where the formulation caused confusion.

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