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# Patterns of sedentary behaviour in school children's everyday life

Master's thesis in Human Movement Science, Trondheim, 1 June 2017

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## **ABSTRACT IN ENGLISH**

This study aimed to investigate (i) whether there is more sedentary time on weekend days than on week days, (ii) whether there is more sedentary time during leisure than during school on week days, (iii) how much sedentary time there is at the day care facility for school children (SFO) compared to both school and leisure on week days, and (iv) whether there is more sedentary time during school on days without physical education than on days with physical education, in school children's everyday life. Additionally, it aimed to investigate whether girls are more sedentary than boys are and whether the older school children are more sedentary than the younger ones are. Sedentary behaviour throughout seven consecutive days for pupils in grades 2–10 was identified from raw acceleration data. Of 75 study participants, 36 had complete data and went to school every week day during data collection. Across all genders and age groups, the school children were sedentary around ten hours per day overall. Sedentary time was higher on weekend days than on week days. For primary school children, sedentary time was higher during leisure than during school on week days. For secondary school children, on the other hand, sedentary time was higher during school than during leisure on week days. Sedentary time during school appeared to be higher on days without physical education than on days with physical education. During SFO, sedentary time was lower than both during school and during leisure on week days.

## **ABSTRACT IN NORWEGIAN**

Denne studien hadde til formål å undersøke (i) om det er mer sedat tid på helgedager enn på hverdager, (ii) om det er mer sedat tid i fritida enn i skoletida, (iii) hvor mye sedat tid det er på skolefritidsorningen (SFO) sammenlikna med både skoletid og fritid på hverdager, og (iv) om det er mer sedat tid i skoletida på dager uten kroppsøving enn på dager uten kroppsøving, i skolebarns dagligliv. I tillegg hadde den til formål å undersøke om jenter er mer sedate enn gutter er og om eldre skolebarn er mer sedate enn yngre skolebarn er. Sedat atferd gjennom sju påfølgende dager hos elever i 2.–10. klassetrinn ble identifisert fra råksselerasjonsdata. Av 75 studiedeltakerne hadde 36 komplette data og var på skolen hver hverdag under datainnsamlinga. På tvers av alle kjønn og aldersgrupper var skolebarna sedate omtrent ti timer per dag, alt i alt. Sedat tid var høyere på helgedager enn på hverdager. Hos barneskoleelever var sedat tid høyere i skoletida enn i fritida på hverdager. Hos ungdomsskoleelever, derimot, var sedat tid høyere i skoletida enn i fritida på hverdager. Sedat tid i skoletida så ut til å være høyere på dager uten kroppsøving enn på dager med kroppsøving. I SFO-tida var sedat tid lavere enn både i skoletida og i fritida på hverdager.

## **ACKNOGLEDGEMENTS**

I would like to thank my supervisors Ellen Marie Bardal and Beatrix Vereijken at the Norwegian University of Science and Technology's Department of Neuromedicine and Movement Science for guidance. I also want to thank my fellow students Sondre Smeby, Tone Sommerset and Åsmund Holmås for collaboration. For help to identify physical behaviour from raw acceleration data, I thank the Department of Computer Science at the Norwegian University of Science and Technology.



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## INTRODUCTION

While there is already good evidence that regular physical activity of moderate and high intensity leads to substantial health benefits, there is increasing interest in identifying the health risks associated with sedentary behaviour (1). An evolutionary rationale for the link between sedentary behaviour and health might be that humans are not adapted to cope with prolonged sedentary behaviour, because natural selection adapts species to their past environments. This approach is addressed in a popular science book by Daniel Lieberman, professor of human evolutionary biology at Harvard university (2). Motor vehicles, home appliance, tap water, grocery stores, screen-based entertainment, social media and online shopping are examples of relatively new technology that allows sedentary behaviour in situations that otherwise would require various volumes of physical activity. According to Lieberman, the rapidly changing environment represents an evolutionary mismatch that causes illness for humans.

A recently published systematic review on sedentary behaviour and health indicators in school-aged children included 235 studies with more than 1.5 million participants in total. A gradient across health indicators demonstrated that less sedentary behaviour – especially screen time, as the most common measure of sedentary behaviour – was associated with better health. Evidence ranged from "very low" to "moderate" quality. The authors stated that higher quality studies using reliable and valid sedentary behaviour measures are needed to confirm this largely observational evidence (3).

Accelerometers are commonly used to identify sedentary behaviour, which refers to any waking activity characterized by an energy expenditure of 1.5 metabolic equivalents or less as well as a sitting or reclining posture (4). Whereas newer approaches rely on second-by-second raw acceleration data and estimation of posture to recognize activity types, earlier approaches rely on minute-by-minute counts and estimation of energy expenditure to classify activity intensities (5). A widely applied cut point for sedentary behaviour in research on children is 100 counts per minute, as measured by using one uniaxial accelerometer (6). However, the technology and application of accelerometers in research on physical behaviour have experienced tremendous advances, and the ability to store raw acceleration data provide opportunities to recognize physical behaviour like sitting and lying (7).

In a large survey conducted in Norway in 2011, sedentary time had increased since 2005–2006 to 6.5 hours per day for six years old children and to 9.5 hours per day for fifteen years old children (8). Norway's director of health in 2001–2012, Bjørn-Inge Larsen, commented that this should be taken just as seriously as the fact that children spent less time on physical activity of moderate and high intensity because sedentary behaviour constitutes an independent health risk. Larsen argued that efforts must be made to reduce sedentary behaviour and that Norway should consider developing recommendations on sedentary behaviour for health (8). From 2014, the Norwegian Directorate of Health recommends people of all ages to reduce sedentary time defined as waking time spent sitting, lying or in another physically resting position. It is also recommended to break up sequences of prolonged sedentary behaviour. These recommendations apply also to those who meet the recommendations on physical activity for health (9).

School children's everyday life in today's Norway typically involves going to school five days a week. Both primary school (grades 1–7) and secondary school (grades 8–10) is compulsory, and engaging in various types of physical activity is a major component in a course called physical education. Furthermore, day care facility for school children (SFO) is offered for all children in grades 1–4.

Children appear to be more sedentary during leisure on week days than during school, and also more sedentary on weekend days than on week days (10, 11). Previous research has demonstrated that specific physical activity opportunities within the school day, such as physical education and recess, can make important contributions to children's overall physical activity (12, 13).

In large surveys, older school children were generally more sedentary than younger school children (8, 14, 15). When it comes to gender, higher sedentary time for girls than for boys was found for children aged from six to fifteen years in the United States of America (14) as well as for six, nine and fifteen years old children in Norway (8) but not for children aged from six to fourteen years in Canada (15). Because counts are manufacturer-specific, it is perhaps worth noting that the uniaxial accelerometers used in the two surveys that indicated a difference between genders are from the same manufacturer, whereas the uniaxial accelerometers used in the survey that did not indicate a difference between genders are from another manufacturer.

This study aimed to investigate (i) whether there is more sedentary time on weekend days than on week days, (ii) whether there is more sedentary time during leisure than during school on week days, (iii) how much sedentary time there is at the day care facility for school children (SFO) compared to both school and leisure on week days, and (iv) whether there is more sedentary time during school on days without physical education than on days with physical education, in school children's everyday life. Additionally, it aimed to investigate whether girls generally are more sedentary than boys are and whether older school children are more sedentary than younger school children are.



## METHODS

Organizationally, this master project was part of a larger study on assessment of children's physical behaviour coordinated by the Norwegian University of Science and Technology (NTNU) which was approved by the Norwegian Centre for Research Data (NSD-nr: 50683). The study was also submitted to the regional committee for medical and health research ethics, who considered the study not to fall under the Health Research Act (REK-nr: 2016/707/REK nord).

**Recruitment.** Children attending a primary school and a secondary school situated close to each other in a rural area of county Sør-Trøndelag in Norway were chosen as study sample. Eligible study participants included any pupil attending grades 2–10, approximately 300 in number. Children and parents received a written letter about the study and a consent form. In all, 84 school children along with their parents consented to participate, and 75 school children actually participated in the study.

**Design.** This is a cross-sectional study where physical behaviour throughout seven consecutive days was assessed by using raw data from two triaxial accelerometers (Axivity AX3). Additionally, participants were asked to report on their activities, including which hours they spent at school and SFO, and whether they participated in physical education.

**Materials.** Axivity AX3 logs data to the open format file type cwa (continuous wave accelerometry) on its onboard memory. The weight of this device is 11 grams, and the dimensions are 23 millimeters x 32.5 millimeters x 7.6 millimeters. Configuration of the accelerometers was done in version 1.0.0.28 of the Open Movement GUI Application. The accelerometers were set to sample at a frequency of 100 hertz and a range of  $\pm 8$  times gravity. Attachment 1 is the questionnaire for primary school children, and attachment 2 is the questionnaire for secondary school children.

For participants in primary school, data was collected from the 2<sup>nd</sup> to the 8<sup>th</sup> of December in 2016. For participants in secondary school, data was collected from the 10<sup>th</sup> to the 16<sup>th</sup> of February in 2017.

**Protocol.** Distribution of questionnaires and attachment of accelerometers was done by researchers at the participating schools. The placements of the accelerometers were the third lumbar vertebra and midway between spina iliaca anterior superior and patella on the right side of the body, as shown in figure 1. The accelerometers were capsuled in a finger cot before they were attached to a piece of fixation tape on the skin. Next, the accelerometers were sealed by transparent adhesive film. The accelerometers were oriented so that the x-axis corresponded to the mediolateral axis of rotation, the y-axis corresponded to the anteroposterior axis of rotation, and the z-axis corresponded to the longitudinal axis of rotation. A researcher visited the participating schools during data collection to reattach accelerometers that had fallen off. Questionnaires and accelerometers were collected after the data collection ended.

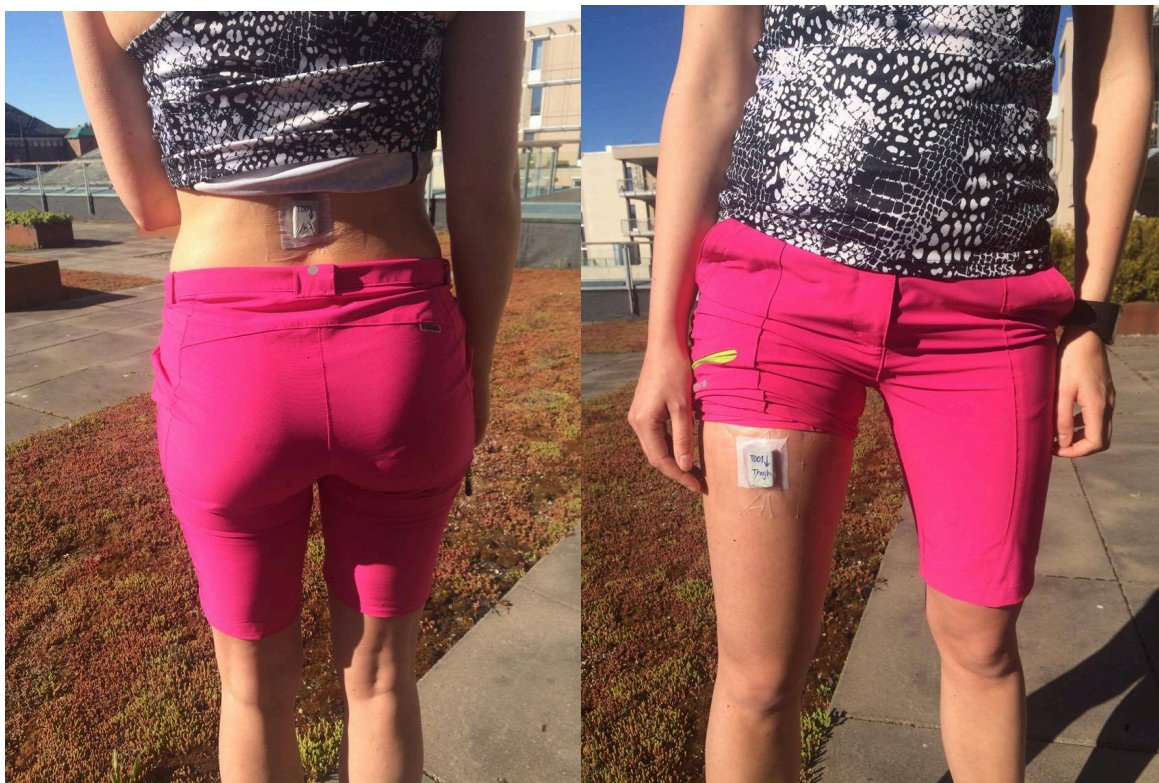


Figure 1. Placements of accelerometers on the body.

**Data analysis.** Physical behaviour was identified from raw acceleration data by using a human activity recognition model developed for children at NTNU's Department of Computer Science. For each second, the data was identified as walking, running, ascending stairs, descending stairs, standing, sitting, lying, bending, cycling standing or cycling sitting. Sitting and lying was categorized as sedentary behaviour. The following definitions of sitting and lying are the ones used for development of the human activity recognition model.

Sitting:

*When the person's buttocks is on the seat of the chair, bed or floor. Sitting can include some movement in the upper body and legs; this should not be tagged as a separate transition. Adjustment of sitting position is allowed.*

Lying:

*The person lies down. Adjustment after lying down is allowed if it does not lead to a change between the prone, supine, right and left lying positions. Movement of arms and head is allowed. Movement of the feet is allowed as long as it does not lead to change in posture.*

Because sedentary behaviour refers to waking activity, only the time between first ambulant activity in the morning to last ambulant activity in the evening was studied. This was visually detected from a chronological overview of activity types, like the example shown in figure 2 from Matlab R2013b.

Waking time on week days was divided into categories based on information from questionnaires. These categories were school time, time at the day care facility for school children (SFO) and leisure time. In cases with missing information about school time, this was set to be the same as for the other participants in the same class.

**Statistical analysis.** IBM SPSS Statistics 21 was used for statistical analysis. To compare genders, a independent samples t-test was run. To compare age groups, a one-way analysis of variance (ANOVA) was run with a Tukey post hoc test, or – when accounting for unequal variance, as with sedentary time on weekend days and during leisure on week days – a Welch one-way ANOVA was run with a Games Howell post hoc test. To compare two separate time periods, a paired samples t-test was run. To compare multiple separate time periods, an ANOVA with repeated measures and pairwise comparison was run.

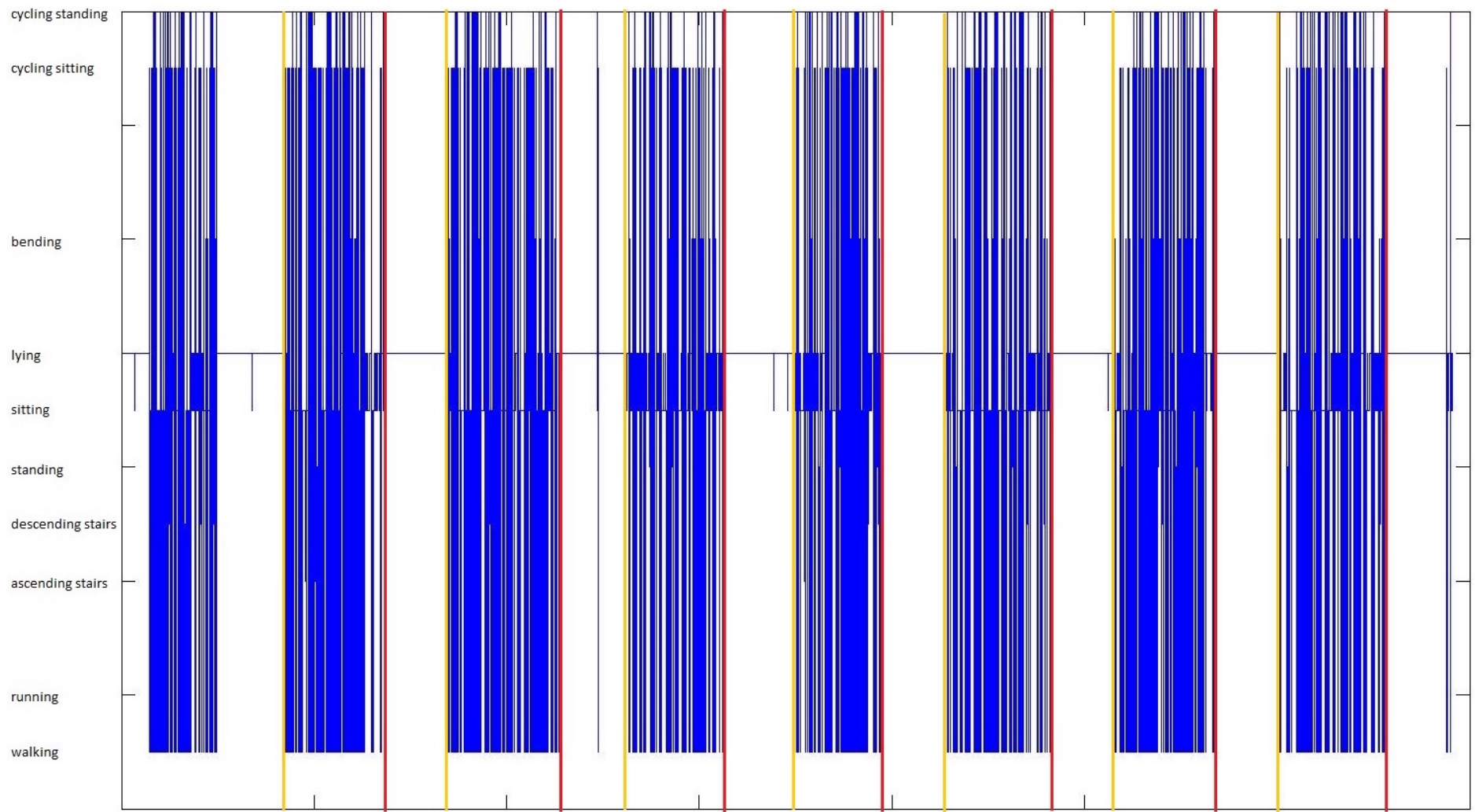


Figure 2. Chronological overview of activity types for one study participant measured over seven whole days. The yellow lines mark the start of waking time for each day. Red lines mark the end of waking time for each day.



## RESULTS

**Study participants.** Results are presented for participants with data for all seven days who went to school every week day during data collection. For 17 study participants, data from one or both accelerometers were missing. For 15 study participants, acceleration data were missing in periods of the data collection. Thus, only 43 of 75 study participants had complete acceleration data from seven consecutive days. The questionnaire data were missing for 4 of them, and 3 study participants were away from school because of illness some days during the data collection. This left 36 school children for data analysis. Of these, 16 were categorized as boys, and 20 were categorized as girls. Moreover, study participants were grouped in småtrinnet (grades 2–4), mellomtrinnet (grades 5–7) and ungdomstrinnet (grades 8–9). Gender of study participants is presented in table 1.

Table 1. Gender of participants in the sample as a whole, in småtrinnet (grades 2–4), in mellomtrinnet (grades 5–7) and in ungdomstrinnet (grades 8–9).

	Boys	Girls
All	16	20
Grades 2–4	5	10
Grades 5–7	6	5
Grades 8–9	5	5

Average waking time for the school children were  $14.8 \pm 0.8$  hours per day. Mean and standard deviation for hours of waking time per day for grades 2–4, grades 5–7 and grades 8–9 is presented in figure 3. Independent samples t-tests indicated that there was no significant difference between boys and girls regarding overall waking time for the sample as a whole ( $t(34)=1.385, p=0.183$ ), for grades 2–4 ( $t(13)=1.887, p=0.083$ ), for grades 5–7 ( $t(9)=1.012, p=0.338$ ) or for grades 8–9 ( $t(8)=-0.883, p=0.403$ ).

Mean and standard deviation (SD) for time spent in different categories is presented for the sample as a whole, grades 2–4, grades 5–7 and grades 8–9 in table 2, along with comparisons of genders. Equal variances were assumed based on Levene's test for all comparisons of genders except for school time on week days for grades 5–7.

Table 2. Waking time on week days, waking time on weekend days, school time and SFO time on week days for the sample as a whole, and split for grades 2–4, grades 5–7 and grades 8–9, along with comparison of genders.

	Sample	Hours per day (mean±SD)	Comparison of genders (boys-girls)
Waking time on week days	All (n=36)	15.1±0.9	$t(34)=1.486, p=0.146$
	Grades 2–4 (n=15)	14.5±0.6	$t(13)=1.487, p=0.161$
	Grades 5–7 (n=11)	15.3±0.8	$t(9)=0.851, p=0.417$
	Grades 8–9 (n=10)	15.8±0.6	$t(8)=-0.581, p=0.577$
Waking time on weekend days	All (n=36)	14.0±1.0	$t(34)=0.505, p=0.617$
	Grades 2–4 (n=15)	13.9±0.7	$t(13)=0.765, p=0.458$
	Grades 5–7 (n=11)	13.6±1.2	$t(9)=0.944, p=0.370$
	Grades 8–9 (n=10)	14.7±0.9	$t(8)=-1.068, p=0.317$
School time on week days	All (n=36)	5.1±0.3	$t(34)=1.407, p=0.169$
	Grades 2–4 (n=15)	4.9±0.0	$t(13)=-0.694, p=0.500$
	Grades 5–7 (n=11)	5.3±0.1	$t(4000)=1.581, p=0.189$
	Grades 8–9 (n=10)	5.2±0.4	$t(8)=0.473, p=0.649$
SFO time on week days	All (n=7)	0.8±0.3	$t(5)=-0.974, p=0.375$

**Sedentary behaviour.** Overall, the school children were sedentary on average  $9.9\pm 0.9$  hours per day throughout the week. Mean and standard deviation for hours of sedentary time per day for grades 2–4, grades 5–7 and grades 8–9 is presented in figure 3. This corresponds to  $68\pm 4$ ,  $68\pm 5$  and  $66\pm 6$  % of their waking time, respectively. Independent samples t-tests indicated that there was no significant difference between boys and girls regarding overall sedentary time for the sample as a whole ( $t(34)=1.213, p=0.233$ ), for grades 2–4 ( $t(13)=1.403, p=0.184$ ), for grades 5–7 ( $t(9)=1.072, p=0.312$ ) or for grades 8–9 ( $t(8)=0.085, p=0.934$ ). A one-way ANOVA on overall sedentary time as a percentage of total waking time indicated that there was no significant difference between age groups ( $F(2,33)=0.685, p=0.511$ ). Exclusion of one participant with extremely low values of overall sedentary time in grades 8–9 did not change this result.

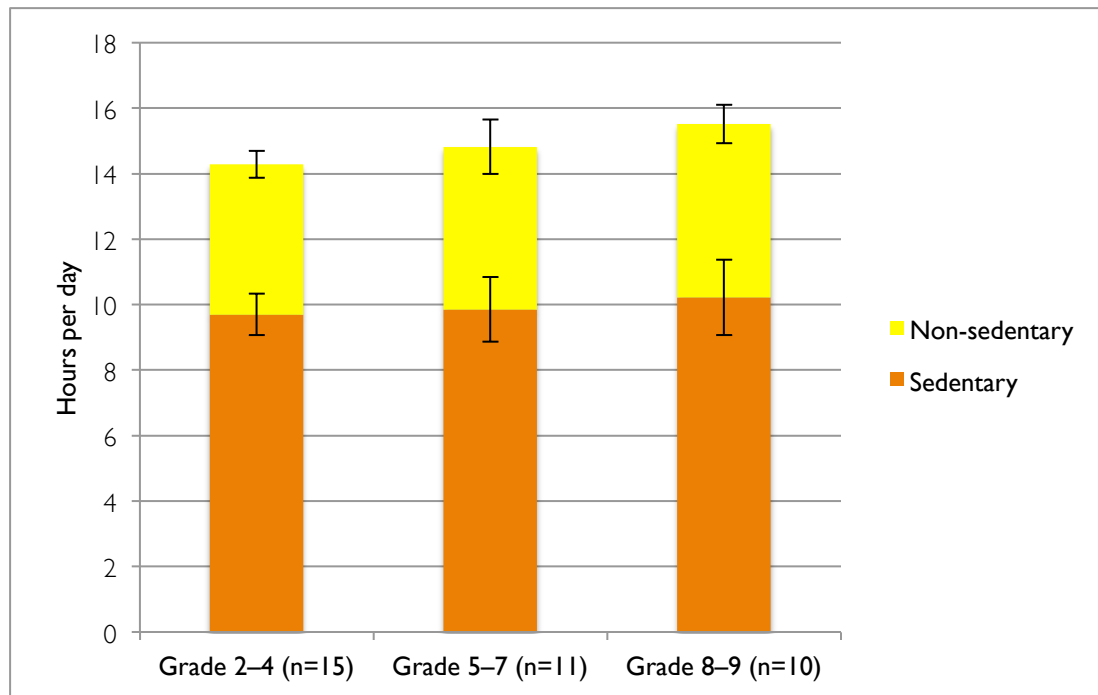


Figure 4. Sedentary time and non-sedentary behaviour for grades 2–4, grades 5–7 and grades 8–9. The sum of sedentary time and non-sedentary time equals waking time. The lower error bars represent one standard deviation for sedentary time. The upper error bars represent one standard deviation for waking time.

Table 3 shows mean and standard deviation for sedentary time in different categories, for the sample as a whole and split for grades 2–4, grades 5–7 and grades 8–9, along with comparison of genders and comparison of age groups. Independent samples t-tests indicated that there was no significant difference between boys and girls regarding any of the studied variables.

On week days, average sedentary time was 9.9 hours per day or 66 % of waking time. As seen in table 3, a one-way ANOVA indicated that there was no significant difference between age groups regarding sedentary time on week days. Exclusion of one study participant with extremely low values of sedentary time on week days in grades 8–9 did not change this result.

On weekend days, average sedentary time was 9.9 hours per day or 71 % of waking time. As seen in table 3, a Welch one-way ANOVA indicated that there was no significant difference between age groups regarding sedentary time on weekend days. This did not change when two study participants with extremely low values in grades 8–9 were excluded or when only the study participant with the lowest value was excluded.

Table 3. Sedentary time on week days, on weekend days, during school on week days, during school on week days with physical education, during school on week days without physical education, during SFO on week days and during leisure on week days, expressed as hours per day and a percentage of time, for the sample as a whole and split for grades 2–4, grades 5–7 and grades 8–9, along with comparison of genders and comparison of age groups.

	Sample	Hours per day (mean±SD)	Percentage of time	Comparison of genders (boys-girls)	Comparison of age groups
On week days	All (n=36)	9.9±1.1	65±5	$t(34)=0.787, p=0.437$	$F(2,33)=0.025, p=0.975$
	Grades 2–4 (n=15)	9.5±0.7	66±4	$t(13)=1.043, p=0.316$	
	Grades 5–7 (n=11)	10.0±1.2	65±5	$t(9)=0.475, p=0.646$	
	Grades 8–9 (n=10)	10.5±1.2	65±5	$t(8)=-0.058, p=0.955$	
On weekend days	All (n=36)	9.9±1.1	71±6	$t(34)=0.834, p=0.410$	$F(2,18.407)=2.397, p=0.119$
	Grades 2–4 (n=15)	10.2±0.8	74±4	$t(13)=1.470, p=0.165$	
	Grades 5–7 (n=11)	9.7±0.9	72±3	$t(9)=0.948, p=0.368$	
	Grades 8–9 (n=10)	9.5±1.5	67±9	$t(8)=0.333, p=0.747$	
During school on week days	All (n=36)	3.2±0.4	62±7	$t(34)=-0.576, p=0.568$	$F(2,33)=5.312, p=0.010^*$
	Grades 2–4 (n=15)	2.9±0.3	60±6	$t(13)=0.288, p=0.778$	
	Grades 5–7 (n=11)	3.2±0.3	61±4	$t(9)=-1.044, p=0.324$	
	Grades 8–9 (n=10)	3.5±0.4	68±8	$t(8)=-0.949, p=0.370$	
During school on week days with physical education	All (n=32)	3.0±0.4	59±6	$t(30)=-0.527, p=0.602$	$F(2,29)=0.179, p=0.837$
	Grades 2–4 (n=14)	2.8±0.3	59±6	$t(12)=0.732, p=0.479$	
	Grades 5–7 (n=10)	3.2±0.4	58±6	$t(8)=-0.546, p=0.600$	
	Grades 8–9 (n=8)	3.3±0.3	59±7	$t(6)=-1.156, p=0.292$	
During school on week days without physical education	All (n=32)	3.2±0.5	64±9	$t(30)=-0.576, p=0.569$	$F(2,29)=4.191, p=0.025^*$
	Grades 2–4 (n=14)	3.0±0.3	61±7	$t(12)=-0.077, p=0.940$	
	Grades 5–7 (n=10)	3.2±0.3	61±5	$t(8)=-0.688, p=0.511$	
	Grades 8–9 (n=8)	3.6±0.8	71±13	$t(6)=-0.728, p=0.494$	
During SFO on week days	All (n=7)	0.8±0.3	47±9	$t(5)=-0.609, p=0.569$	
During leisure on week days	All (n=36)	6.6±1.0	68±6	$t(34)=1.249, p=0.220$	$F(2,18.647)=4.828, p=0.020^*$
	Grades 2–4 (n=15)	6.2±1.0	70±4	$t(13)=1.485, p=0.169$	
	Grades 5–7 (n=11)	6.9±1.1	68±7	$t(9)=0.865, p=0.409$	
	Grades 8–9 (n=10)	6.7±1.0	64±5	$t(8)=0.783, p=0.456$	

Comparisons are based on the relative measure of sedentary behaviour (percentage of time). ”\*” marks statistical significance on a 0.05-level.

A paired samples t-test indicated that sedentary time as a percentage of waking time was  $6\pm 5$  percentage points higher on weekend days than on week days ( $t(35)=6.374$ ,  $p<0.0005$ ). For grades 2–4, sedentary time was  $8\pm 5$  percentage points higher on weekend days than on week days ( $t(14)=6.436$ ,  $p<0.0005$ ). For grades 5–7, sedentary time was  $6\pm 5$  percentage points higher on weekend days than on week days ( $t(10)=4.449$ ,  $p=0.001$ ). For grades 8–9, there was no significant difference regarding sedentary time between week days and weekend days ( $t(9)=1.115$ ,  $p=0.294$ ). However, exclusion of the two participants with extremely low values of sedentary time on week days and/or weekend days resulted in a significant difference also for grades 8–9 ( $t(7)=3.483$ ,  $p=0.010$ ), where sedentary time on weekend days was  $4\pm 3$  percentage points higher than on week days.

During school, the school children were sedentary on average 62 % of the time. As seen in table 3, a one-way ANOVA indicated that there was a significant difference between age groups. A Tukey post hoc test revealed that sedentary time during school for grades 8–9 was significantly higher than for grades 2–4 (8 percentage points,  $p=0.012$ ) and for grades 5–7 (7 percentage points,  $p=0.031$ ). Sedentary time during school was not significantly different between grades 5–7 and grades 2–4 (1 percentage point,  $p=0.976$ ). Exclusion of one study participant with extremely low values of sedentary time during school in grades 8–9 did not change these results.

During leisure on week days, the school children were sedentary on average 68 % of the time. As seen in table 3, a Welch one-way ANOVA indicated that there was a significant difference between age groups. A Games Howell post hoc test revealed that sedentary time during leisure on week days was significantly higher for grades 2–4 than for grades 8–9 (6 percentage points,  $p=0.014$ ). Sedentary time during leisure on week days was not significantly different between grades 2–4 and grades 5–7 (2 percentage points,  $p=0.631$ ) or between grades 5–7 and grades 8–9 (4 percentage points,  $p=0.390$ ).

A paired samples t-test indicated that there was  $6\pm 9$  percentage points more sedentary time during leisure than during school on week days ( $t(35)=3.814, p=0.001$ ). For grades 2–4, sedentary time was  $10\pm 6$  percentage points higher during leisure than during school on week days ( $t(14)=6.314, p<0.0005$ ). For grades 5–7, sedentary time was  $7\pm 8$  percentage points higher during leisure than during school on week days ( $t(10)=3.176, p=0.010$ ). For grades 8–9, there was no significant difference regarding sedentary time between school time and leisure time on week days ( $t(9)=1.552, p=0.155$ ). However, exclusion of the one study participant with extremely low values of sedentary time during school resulted in a significant difference also for grades 8–9, with sedentary time during school being  $5\pm 5$  percentage points higher than during leisure on week days ( $t(8)=3.210, p=0.012$ ).

Of the study participants in grades 2–4, 7 school children reported that they spent time at the day care facility for school children (SFO). During SFO, they were sedentary on average 47 % of the time. An ANOVA with repeated measures indicated that there was a significant difference in sedentary time between school, SFO and leisure on week days ( $F(1.386,8.315)=24.004, p=0.001$ ). Pairwise comparisons revealed that sedentary time during SFO was  $12\pm 3$  percentage points lower than during school ( $p=0.023$ ) and  $23\pm 4$  percentage points lower than during leisure on week days ( $p=0.005$ ).

In all, 32 study participants reported that they took part in physical education during the data collection. The school children in grades 2–4 took part in physical education during school zero, one or two day(s). The school children in grades 5–7 and grades 8–9 took part in physical education during school zero, one, two or three day(s). It was apparent from the questionnaires that some of the school children had physical education as an elective course in addition to mandatory physical education.

For the study participants who reported that they took part in physical education during the data collection, average sedentary time was 59 % of school time on days with physical education. As seen in table 3, a one-way ANOVA indicated that there was no significant difference in sedentary time during school on days with physical education between age groups.

For the study participants who reported that they took part in physical education during the data collection, average sedentary time was 63 % of school time on days without physical education. As seen in table 3, a one-way ANOVA indicated that there was a significant difference between age groups. A Tukey post hoc test revealed that sedentary time during school on days without physical education was significantly higher for grades 8–9 than for grades 2–4 (10 percentage points,  $p=0.030$ ). There was no significant difference in sedentary time during school on days without physical education between grades 5–7 and grades 2–4 (0 percentage points,  $p=0.997$ ) or between grades 8–9 and 5–7 (10 percentage points,  $p=0.052$ ). However, exclusion of one study participant with extremely low values in grades 2–4 and one study participant with extremely low values in grades 8–9 resulted in the Tukey post hoc test revealing that sedentary time during school days without physical education was significantly higher for grades 8–9 than for grades 5–7 (14 percentage points,  $p<0.0005$ ) as well as for grades 2–4.

A paired samples t-test indicated that there was  $5\pm 9$  percentage points more sedentary time during school on days without physical education than on days with physical education ( $t(31)=3.068$ ,  $p=0.004$ ). For grades 8–9, there was  $12\pm 8$  percentage points more sedentary time during school on days without physical education than on days with physical education ( $t(7)=4.442$ ,  $p=0.003$ ). There was no significant difference in sedentary time during school between days without physical education and days with physical education for grades 2–4 ( $t(13)=0.814$ ,  $p=0.430$ ) or grades 5–7 ( $t(9)=1.410$ ,  $p=0.192$ ). However, exclusion of two study participants with extremely low values of sedentary time during school on days without physical education resulted in a significant difference for grades 2–4 ( $t(12)=3.297$ ,  $p=0.006$ ) as well as for grades 8–9.





## **DISCUSSION**

In this cross-sectional study conducted in a rural area of county Sør-Trøndelag in Norway, sedentary behaviour was measured using raw acceleration data. The school children were sedentary around ten hours per day overall. Although this is even more than in the large survey upon which Norway's former director of health commented that efforts must be made to reduce sedentary behaviour (8), it is beyond the scope of this thesis to conclude if ten sedentary hours per day is too much for children in a health perspective. However, this study might provide insights into patterns of sedentary behaviour in school children's everyday life.

The first study aim is to investigate whether there is more sedentary time on weekend days than on week days in school children's everyday life. In accordance with previous research (10, 11) sedentary time expressed as a percentage of waking time was higher on weekend days than on week days, despite that the number of hours spent sedentary per day was the same.

The second study aim was to investigate whether there is more sedentary time during leisure than during school on week days in school children's everyday life. For primary school children, there was more sedentary time during leisure than during school on week days. This is in accordance with previous research (10, 11). For secondary school children, on the other hand, there was more sedentary behaviour during school than during leisure on week days.

The third study aim was to investigate how much sedentary time there is at the day care facility for school children (SFO) compared to both school and leisure on week days in school children's everyday life. During SFO, sedentary time was lower than both during school and during leisure on week days. This corresponds to the Education Law which states that the day care facility for school children shall be designed for play as well as culture and leisure activities appropriate to the age, functional level and interests of the children.

The fourth study aim was to investigate whether there is more sedentary time during school on days without physical education than on days with physical education in school children's everyday life. Sedentary time during school appeared to be higher on days without physical education than on days with physical education, which suggests that physical education might serve to reduce sedentary time during school – and not only to increase physical activity, as demonstrated in previous research (13).

An additional study aim was to investigate whether girls generally are more sedentary than boys are. There was no significant difference between genders regarding any of the studied variables for the sample as a whole or split for grades 2–4, grades 5–7 and grades 8–9. This is in line with one large survey (15) but not in line with two other large surveys (8, 14). Considering the possibility that boys and girls in general move differently, unequal technology and application of accelerometers might cause contradicting results.

The other additional study aim was to investigate whether the older school children are more sedentary than the younger ones are. Contrary to previous research (8, 14, 15), the younger school children were not less sedentary overall than the older school children. This was true for both week days and weekend days. The reason for contradicting results might be that second-by-second raw acceleration data is a more precise measure of sedentary behaviour than minute-by-minute counts are. Sedentary time during school was significantly higher for secondary school children than for primary school children only during school. Similar results were found for sedentary time during school on days without physical education, but sedentary time during school was not significantly different between age groups on days with physical education. During leisure on week days, sedentary time was significantly higher in the youngest age group than in the oldest age group.

**Limitations of the study.** The study sample is small and not nationally representative. Moreover, data collection was done in the winter time. Considering that children in Denmark aged from eight to eleven years had five percent more sedentary time during winter compared to spring (16), it could be that average sedentary time throughout an entire school year is lower than what it was during data collection in the winter season.

**Conclusions.** Across all genders and age groups, the school children were sedentary around ten hours per day overall. Sedentary time was higher on weekend days than on week days. For primary school children, sedentary time was higher in during leisure than during school on week days. For secondary school children, on the other hand, sedentary time was higher during school than during leisure on week days. Sedentary time during school appeared to be higher on days without physical education than on days with physical education. During day care facility for school children, sedentary time was lower than both during school and during leisure.

**Future directions.** The data used in this study can also be used to investigate patterns of breaks in sedentary behaviour. This would be interesting because it is recommended to break up sequences of prolonged sedentary behaviour. Analyses of sedentary behaviour during recess would be possible with relevant information from schools, and with more complete data from the questionnaires it would be possible to investigate whether school children are less sedentary with organized leisure activities than without. Moreover, it would be interesting to investigate the relation between sedentary behaviour and patterns of physical behaviour in the approximately five hours of non-sedentary behaviour per day. To address the limitations of this study, it could be extended to include a nationally representative sample and conducted through all seasons.



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Subjektnummer: \_\_\_\_\_

Fredag

2/12/2016

1. Sto opp klokka: \_\_\_\_\_ Hælslipp klokka: \_\_\_\_\_.\_\_\_\_\_.\_\_\_\_\_  
(time)(min)(sek)

2. Har du vært på skolen i dag?  Ja Hvis ja, når? kl. \_\_\_\_\_  
 Nei Hvis nei, hopp til spørsmål 7.

3. Hvordan dro du til skolen?  Gikk  Sykla  Ble kjørt  Annet: \_\_\_\_\_

4. Hvordan dro du fra skolen?  Gikk  Sykla  Ble kjørt  Annet: \_\_\_\_\_

5. Hadde du kroppsøving på skolen?  Ja  Nei

Hvis ja, hva gjorde du i kroppsøvinga? \_\_\_\_\_

6. Har du deltatt i fysisk aktivitet i noen andre fag enn kroppsøving (for eksempel turdag/uteskole). I så fall, hva gjorde du?  
\_\_\_\_\_

7. Har du vært på SFO?  Ja  Nei Hvis ja, når? kl. \_\_\_\_\_

8. Har du gjort lekser utafør skoletid?  Ja  Nei Hvis ja, når? kl. \_\_\_\_\_

9. Har du spilt Pokémon Go?  Ja Hvis ja, hvor mange minutt? \_\_\_\_\_  
 Nei

10. Har du deltatt på organisert fritidsaktivitet?  Ja  Nei

Hvis ja, hvilke(n)? \_\_\_\_\_

11. Hva har du gjort i ettermiddag/kveld? (Skriv i stikkordsform.)  
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\_\_\_\_\_

12. Hælslipp klokka: \_\_\_\_\_.\_\_\_\_\_.\_\_\_\_\_  
(time)(min)(sek) La seg klokka: \_\_\_\_\_

Subjektnummer: \_\_\_\_\_

Lørdag

3/12/2016

1. Sto opp klokka: \_\_\_\_\_ Hæslipp klokka: \_\_\_\_\_.\_\_\_\_\_.\_\_\_\_\_  
(time)(min)(sek)

2. Har du gjort skolearbeid?  Ja  Nei Hvis ja, når? kl. \_\_\_\_\_

4. Har du spilt Pokémon Go?  Ja Hvis ja, hvor mange minutt? \_\_\_\_\_  
 Nei

5. Har du deltatt på organisert fritidsaktivitet?  Ja  Nei

Hvis ja, hvilke(n)? \_\_\_\_\_

6. Hva har du gjort i dag? (Skriv i stikkordsform.)

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7. Hæslipp klokka: \_\_\_\_\_.\_\_\_\_\_.\_\_\_\_\_  
(time)(min)(sek)

La seg klokka: \_\_\_\_\_



Subjektnummer: \_\_\_\_\_

Søndag

4/12/2016

1. Sto opp klokka: \_\_\_\_\_ Hæslipp klokka: \_\_\_\_\_.\_\_\_\_\_.\_\_\_\_\_  
(time)(min)(sek)

2. Har du gjort skolearbeid?  Ja  Nei Hvis ja, når? kl. \_\_\_\_\_

4. Har du spilt Pokémon Go?  Ja Hvis ja, hvor mange minutt? \_\_\_\_\_  
 Nei

5. Har du deltatt på organisert fritidsaktivitet?  Ja  Nei

Hvis ja, hvilke(n)? \_\_\_\_\_

6. Hva har du gjort i dag? (Skriv i stikkordsform.)

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7. Hæslipp klokka: \_\_\_\_\_.\_\_\_\_\_.\_\_\_\_\_  
(time)(min)(sek)

La seg klokka: \_\_\_\_\_

Subjektnummer: \_\_\_\_\_

Mandag 5/12/2016

1. Sto opp klokka: \_\_\_\_\_ Hælslipp klokka: \_\_\_\_\_.\_\_\_\_\_.\_\_\_\_\_  
(time)(min)(sek)

2. Har du vært på skolen i dag?  Ja Hvis ja, når? kl. \_\_\_\_\_  
 Nei Hvis nei, hopp til spørsmål 7.

3. Hvordan dro du til skolen?  Gikk  Sykla  Ble kjørt  Annet: \_\_\_\_\_

4. Hvordan dro du fra skolen?  Gikk  Sykla  Ble kjørt  Annet: \_\_\_\_\_

5. Hadde du kroppsøving på skolen?  Ja  Nei

Hvis ja, hva gjorde du i kroppsøvinga? \_\_\_\_\_

6. Har du deltatt i fysisk aktivitet i noen andre fag enn kroppsøving (for eksempel turdag/uteskole). I så fall, hva gjorde du?  
\_\_\_\_\_

7. Har du vært på SFO?  Ja  Nei Hvis ja, når? kl. \_\_\_\_\_

8. Har du gjort lekser utafør skoletid?  Ja  Nei Hvis ja, når? kl. \_\_\_\_\_

9. Har du spilt Pokémon Go?  Ja Hvis ja, hvor mange minutt? \_\_\_\_\_  
 Nei

10. Har du deltatt på organisert fritidsaktivitet?  Ja  Nei

Hvis ja, hvilke(n)? \_\_\_\_\_

11. Hva har du gjort i ettermiddag/kveld? (Skriv i stikkordsform.)  
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12. Hælslipp klokka: \_\_\_\_\_.\_\_\_\_\_.\_\_\_\_\_  
(time)(min)(sek) La seg klokka: \_\_\_\_\_

Subjektnummer: \_\_\_\_\_

Tirsdag 6/12/2016

1. Sto opp klokka: \_\_\_\_\_ Hælslipp klokka: \_\_\_\_\_.\_\_\_\_\_.\_\_\_\_\_  
(time)(min)(sek)

2. Har du vært på skolen i dag?  Ja Hvis ja, når? kl. \_\_\_\_\_  
 Nei Hvis nei, hopp til spørsmål 7.

3. Hvordan dro du til skolen?  Gikk  Sykla  Ble kjørt  Annet: \_\_\_\_\_

4. Hvordan dro du fra skolen?  Gikk  Sykla  Ble kjørt  Annet: \_\_\_\_\_

5. Hadde du kroppsøving på skolen?  Ja  Nei

Hvis ja, hva gjorde du i kroppsøvinga? \_\_\_\_\_

6. Har du deltatt i fysisk aktivitet i noen andre fag enn kroppsøving (for eksempel turdag/uteskole). I så fall, hva gjorde du?  
\_\_\_\_\_

7. Har du vært på SFO?  Ja  Nei Hvis ja, når? kl. \_\_\_\_\_

8. Har du gjort lekser utafør skoletid?  Ja  Nei Hvis ja, når? kl. \_\_\_\_\_

9. Har du spilt Pokémon Go?  Ja Hvis ja, hvor mange minutt? \_\_\_\_\_  
 Nei

10. Har du deltatt på organisert fritidsaktivitet?  Ja  Nei

Hvis ja, hvilke(n)? \_\_\_\_\_

11. Hva har du gjort i ettermiddag/kveld? (Skriv i stikkordsform.)  
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12. Hælslipp klokka: \_\_\_\_\_.\_\_\_\_\_.\_\_\_\_\_  
(time)(min)(sek) La seg klokka: \_\_\_\_\_

Subjektnummer: \_\_\_\_\_

Onsdag 7/12/2016

1. Sto opp klokka: \_\_\_\_\_ Hælslipp klokka: \_\_\_\_\_.\_\_\_\_\_.\_\_\_\_\_  
(time)(min)(sek)

2. Har du vært på skolen i dag?  Ja Hvis ja, når? kl. \_\_\_\_\_  
 Nei Hvis nei, hopp til spørsmål 7.

3. Hvordan dro du til skolen?  Gikk  Sykla  Ble kjørt  Annet: \_\_\_\_\_

4. Hvordan dro du fra skolen?  Gikk  Sykla  Ble kjørt  Annet: \_\_\_\_\_

5. Hadde du kroppsøving på skolen?  Ja  Nei

Hvis ja, hva gjorde du i kroppsøvinga? \_\_\_\_\_

6. Har du deltatt i fysisk aktivitet i noen andre fag enn kroppsøving (for eksempel turdag/uteskole). I så fall, hva gjorde du?  
\_\_\_\_\_

7. Har du vært på SFO?  Ja  Nei Hvis ja, når? kl. \_\_\_\_\_

8. Har du gjort lekser utafør skoletid?  Ja  Nei Hvis ja, når? kl. \_\_\_\_\_

9. Har du spilt Pokémon Go?  Ja Hvis ja, hvor mange minutt? \_\_\_\_\_  
 Nei

10. Har du deltatt på organisert fritidsaktivitet?  Ja  Nei

Hvis ja, hvilke(n)? \_\_\_\_\_

11. Hva har du gjort i ettermiddag/kveld? (Skriv i stikkordsform.)  
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\_\_\_\_\_

12. Hælslipp klokka: \_\_\_\_\_.\_\_\_\_\_.\_\_\_\_\_  
(time)(min)(sek) La seg klokka: \_\_\_\_\_

Subjektnummer: \_\_\_\_\_

Torsdag 8/12/2016

1. Sto opp klokka: \_\_\_\_\_ Hælslipp klokka: \_\_\_\_\_.\_\_\_\_\_.\_\_\_\_\_  
(time)(min)(sek)

2. Har du vært på skolen i dag?  Ja Hvis ja, når? kl. \_\_\_\_\_  
 Nei Hvis nei, hopp til spørsmål 7.

3. Hvordan dro du til skolen?  Gikk  Sykla  Ble kjørt  Annet: \_\_\_\_\_

4. Hvordan dro du fra skolen?  Gikk  Sykla  Ble kjørt  Annet: \_\_\_\_\_

5. Hadde du kroppsøving på skolen?  Ja  Nei

Hvis ja, hva gjorde du i kroppsøvinga? \_\_\_\_\_

6. Har du deltatt i fysisk aktivitet i noen andre fag enn kroppsøving (for eksempel turdag/uteskole). I så fall, hva gjorde du?  
\_\_\_\_\_

7. Har du vært på SFO?  Ja  Nei Hvis ja, når? kl. \_\_\_\_\_

8. Har du gjort lekser utafør skoletid?  Ja  Nei Hvis ja, når? kl. \_\_\_\_\_

9. Har du spilt Pokémon Go?  Ja Hvis ja, hvor mange minutt? \_\_\_\_\_  
 Nei

10. Har du deltatt på organisert fritidsaktivitet?  Ja  Nei

Hvis ja, hvilke(n)? \_\_\_\_\_

11. Hva har du gjort i ettermiddag/kveld? (Skriv i stikkordsform.)  
\_\_\_\_\_  
\_\_\_\_\_

12. Hælslipp klokka: \_\_\_\_\_.\_\_\_\_\_.\_\_\_\_\_  
(time)(min)(sek) La seg klokka: \_\_\_\_\_

Subjektnummer: \_\_\_\_\_

Fredag

10/2/2017

1. Sto opp klokka: \_\_\_\_\_ Hælslipp klokka: \_\_\_\_\_.\_\_\_\_\_.\_\_\_\_\_  
(time)(min)(sek)

2. Har du vært på skolen i dag?  Ja Hvis ja, når? kl. \_\_\_\_\_  
 Nei Hvis nei, hopp til spørsmål 7.

3. Hvordan dro du til skolen?  Gikk  Sykla  Ble kjørt  Annet: \_\_\_\_\_

4. Hvordan dro du fra skolen?  Gikk  Sykla  Ble kjørt  Annet: \_\_\_\_\_

5. Hadde du kroppsøving på skolen?  Ja  Nei

Hvis ja, hva gjorde du i kroppsøvinga? \_\_\_\_\_

6. Har du deltatt i fysisk aktivitet i noen andre fag enn kroppsøving (for eksempel turdag/uteskole). I så fall, hva gjorde du?  
\_\_\_\_\_

7. Har du gjort lekser utafør skoletid?  Ja  Nei Hvis ja, når? kl. \_\_\_\_\_

8. Har du spilt Pokémon Go?  Ja Hvis ja, hvor mange minutt? \_\_\_\_\_  
 Nei

9. Har du deltatt på organisert fritidsaktivitet?  Ja  Nei

Hvis ja, hvilke(n)? \_\_\_\_\_

10. Hva har du gjort i ettermiddag/kveld? (Skriv i stikkordsform.)  
\_\_\_\_\_  
\_\_\_\_\_

11. Hælslipp klokka: \_\_\_\_\_.\_\_\_\_\_.\_\_\_\_\_  
(time)(min)(sek) La seg klokka: \_\_\_\_\_

Subjektnummer: \_\_\_\_\_

Lørdag

11/2/2017

1. Sto opp klokka: \_\_\_\_\_ Hæslipp klokka: \_\_\_\_\_.\_\_\_\_\_.\_\_\_\_\_  
(time)(min)(sek)

2. Har du gjort skolearbeid?  Ja  Nei Hvis ja, når? kl. \_\_\_\_\_

4. Har du spilt Pokémon Go?  Ja Hvis ja, hvor mange minutt? \_\_\_\_\_  
 Nei

5. Har du deltatt på organisert fritidsaktivitet?  Ja  Nei

Hvis ja, hvilke(n)? \_\_\_\_\_

6. Hva har du gjort i dag? (Skriv i stikkordsform.)

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7. Hæslipp klokka: \_\_\_\_\_.\_\_\_\_\_.\_\_\_\_\_  
(time)(min)(sek)

La seg klokka: \_\_\_\_\_

Subjektnummer: \_\_\_\_\_

Søndag

12/2/2017

1. Sto opp klokka: \_\_\_\_\_ Hæslipp klokka: \_\_\_\_\_.\_\_\_\_\_.\_\_\_\_\_  
(time)(min)(sek)

2. Har du gjort skolearbeid?  Ja  Nei Hvis ja, når? kl. \_\_\_\_\_

4. Har du spilt Pokémon Go?  Ja Hvis ja, hvor mange minutt? \_\_\_\_\_  
 Nei

5. Har du deltatt på organisert fritidsaktivitet?  Ja  Nei

Hvis ja, hvilke(n)? \_\_\_\_\_

6. Hva har du gjort i dag? (Skriv i stikkordsform.)

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7. Hæslipp klokka: \_\_\_\_\_.\_\_\_\_\_.\_\_\_\_\_  
(time)(min)(sek)

La seg klokka: \_\_\_\_\_



Subjektnummer: \_\_\_\_\_

Mandag 13/2/2017

1. Sto opp klokka: \_\_\_\_\_ Hælslipp klokka: \_\_\_\_\_.\_\_\_\_\_.\_\_\_\_\_  
(time)(min)(sek)

2. Har du vært på skolen i dag?  Ja Hvis ja, når? kl. \_\_\_\_\_  
 Nei Hvis nei, hopp til spørsmål 7.

3. Hvordan dro du til skolen?  Gikk  Sykla  Ble kjørt  Annet: \_\_\_\_\_

4. Hvordan dro du fra skolen?  Gikk  Sykla  Ble kjørt  Annet: \_\_\_\_\_

5. Hadde du kroppsøving på skolen?  Ja  Nei

Hvis ja, hva gjorde du i kroppsøvinga? \_\_\_\_\_

6. Har du deltatt i fysisk aktivitet i noen andre fag enn kroppsøving (for eksempel turdag/uteskole). I så fall, hva gjorde du?  
\_\_\_\_\_

7. Har du gjort lekser utafør skoletid?  Ja  Nei Hvis ja, når? kl. \_\_\_\_\_

8. Har du spilt Pokémon Go?  Ja Hvis ja, hvor mange minutt? \_\_\_\_\_  
 Nei

9. Har du deltatt på organisert fritidsaktivitet?  Ja  Nei

Hvis ja, hvilke(n)? \_\_\_\_\_

10. Hva har du gjort i ettermiddag/kveld? (Skriv i stikkordsform.)  
\_\_\_\_\_  
\_\_\_\_\_

11. Hælslipp klokka: \_\_\_\_\_.\_\_\_\_\_.\_\_\_\_\_  
(time)(min)(sek) La seg klokka: \_\_\_\_\_

Subjektnummer: \_\_\_\_\_

Tirsdag 14/2/2017

1. Sto opp klokka: \_\_\_\_\_ Hælslipp klokka: \_\_\_\_\_.\_\_\_\_\_.\_\_\_\_\_  
(time)(min)(sek)

2. Har du vært på skolen i dag?  Ja Hvis ja, når? kl. \_\_\_\_\_  
 Nei Hvis nei, hopp til spørsmål 7.

3. Hvordan dro du til skolen?  Gikk  Sykla  Ble kjørt  Annet: \_\_\_\_\_

4. Hvordan dro du fra skolen?  Gikk  Sykla  Ble kjørt  Annet: \_\_\_\_\_

5. Hadde du kroppsøving på skolen?  Ja  Nei

Hvis ja, hva gjorde du i kroppsøvinga? \_\_\_\_\_

6. Har du deltatt i fysisk aktivitet i noen andre fag enn kroppsøving (for eksempel turdag/uteskole). I så fall, hva gjorde du?  
\_\_\_\_\_

7. Har du gjort lekser utafør skoletid?  Ja  Nei Hvis ja, når? kl. \_\_\_\_\_

8. Har du spilt Pokémon Go?  Ja Hvis ja, hvor mange minutt? \_\_\_\_\_  
 Nei

9. Har du deltatt på organisert fritidsaktivitet?  Ja  Nei

Hvis ja, hvilke(n)? \_\_\_\_\_

10. Hva har du gjort i ettermiddag/kveld? (Skriv i stikkordsform.)  
\_\_\_\_\_  
\_\_\_\_\_

11. Hælslipp klokka: \_\_\_\_\_.\_\_\_\_\_.\_\_\_\_\_  
(time)(min)(sek) La seg klokka: \_\_\_\_\_

Subjektnummer: \_\_\_\_\_

Onsdag 15/2/2017

1. Sto opp klokka: \_\_\_\_\_ Hælslipp klokka: \_\_\_\_\_.\_\_\_\_\_.\_\_\_\_\_  
(time)(min)(sek)

2. Har du vært på skolen i dag?  Ja Hvis ja, når? kl. \_\_\_\_\_  
 Nei Hvis nei, hopp til spørsmål 7.

3. Hvordan dro du til skolen?  Gikk  Sykla  Ble kjørt  Annet: \_\_\_\_\_

4. Hvordan dro du fra skolen?  Gikk  Sykla  Ble kjørt  Annet: \_\_\_\_\_

5. Hadde du kroppsøving på skolen?  Ja  Nei

Hvis ja, hva gjorde du i kroppsøvinga? \_\_\_\_\_

6. Har du deltatt i fysisk aktivitet i noen andre fag enn kroppsøving (for eksempel turdag/uteskole). I så fall, hva gjorde du?  
\_\_\_\_\_

7. Har du gjort lekser utafør skoletid?  Ja  Nei Hvis ja, når? kl. \_\_\_\_\_

8. Har du spilt Pokémon Go?  Ja Hvis ja, hvor mange minutt? \_\_\_\_\_  
 Nei

9. Har du deltatt på organisert fritidsaktivitet?  Ja  Nei

Hvis ja, hvilke(n)? \_\_\_\_\_

10. Hva har du gjort i ettermiddag/kveld? (Skriv i stikkordsform.)  
\_\_\_\_\_  
\_\_\_\_\_

11. Hælslipp klokka: \_\_\_\_\_.\_\_\_\_\_.\_\_\_\_\_  
(time)(min)(sek) La seg klokka: \_\_\_\_\_

Subjektnummer: \_\_\_\_\_

Torsdag 16/2/2017

1. Sto opp klokka: \_\_\_\_\_ Hælslipp klokka: \_\_\_\_\_.\_\_\_\_\_.\_\_\_\_\_  
(time)(min)(sek)

2. Har du vært på skolen i dag?  Ja Hvis ja, når? kl. \_\_\_\_\_  
 Nei Hvis nei, hopp til spørsmål 7.

3. Hvordan dro du til skolen?  Gikk  Sykla  Ble kjørt  Annet: \_\_\_\_\_

4. Hvordan dro du fra skolen?  Gikk  Sykla  Ble kjørt  Annet: \_\_\_\_\_

5. Hadde du kroppsøving på skolen?  Ja  Nei

Hvis ja, hva gjorde du i kroppsøvinga? \_\_\_\_\_

6. Har du deltatt i fysisk aktivitet i noen andre fag enn kroppsøving (for eksempel turdag/uteskole). I så fall, hva gjorde du?  
\_\_\_\_\_

7. Har du gjort lekser utafør skoletid?  Ja  Nei Hvis ja, når? kl. \_\_\_\_\_

8. Har du spilt Pokémon Go?  Ja Hvis ja, hvor mange minutt? \_\_\_\_\_  
 Nei

9. Har du deltatt på organisert fritidsaktivitet?  Ja  Nei

Hvis ja, hvilke(n)? \_\_\_\_\_

10. Hva har du gjort i ettermiddag/kveld? (Skriv i stikkordsform.)  
\_\_\_\_\_  
\_\_\_\_\_

11. Hælslipp klokka: \_\_\_\_\_.\_\_\_\_\_.\_\_\_\_\_  
(time)(min)(sek) La seg klokka: \_\_\_\_\_