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School-level correlates of physical activity intensity in 10-year old children

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Abstract

Purpose—Little is known about school environmental factors that promote or inhibit activity, especially from studies using objective measures in large representative samples. We therefore aimed to study associations between activity intensities and physical and social school environmental factors.

Methods—A population-based sample of 1908 British children (SPEEDY study), mean age 10.3 years (SD: 0.3), recruited from 92 schools across Norfolk, UK, with valid activity data (assessed with Actigraph accelerometers). Outcome measures were school-based (8am–4pm on weekdays) time (in minutes) spent in sedentary (<100 counts/min), moderate (2000–3999 counts/min) and vigorous (>4000 counts/min) activity. A total of 40 school physical and social environmental factors were assessed. Multivariable multilevel linear regression analyses adjusted for children's sex and body mass index were conducted; interactions with sex were investigated.

Results—Availability of a 'Park and Stride' scheme was negatively associated with sedentary minutes (−7.74; 95% CI: −14.8; −0.70). Minutes of moderate activity were associated with the availability of a lollipop person (1.33, 95% CI: 0.35; 2.62) and objectively-assessed walking provision (1.70, 95% CI: 0.85; 2.56). The number of sports facilities of at least medium quality (0.47, 95% CI: 0.16; 0.79), not having a policy on physical activity (−2.28, 95% CI: −3.62; −0.95), and, in boys only, provision of pedestrian training (1.89; 95% CI: 0.77; 3.01) were associated with minutes of vigorous activity.

Conclusions—Only a small number of school-level factors were associated with children's objectively-measured physical activity intensity, giving few pointers for potential future intervention efforts. Further research should focus on using objective measures to elucidate what factors may explain the school-level variance in activity levels.

Keywords

school; physical activity; behaviour; correlates; physical environment; social environment

INTRODUCTION

In childhood, higher levels of physical activity have been associated with improved metabolic profile, mental health, bone health and lower fat mass (1-4). It has been suggested that physical activity levels track from childhood through adolescence and into adulthood, making physical activity promotion in children a key strategy for promoting future health (5). A recent review showed that previous efforts to promote physical activity in children and adolescents were largely ineffective or achieved only modest changes at short-term follow-up (6). Some, albeit limited, evidence of effect was shown for school-based interventions to increase activity, including environmental interventions. This highlights the potential for interventions developed around the school in this age group. However, in order to facilitate intervention development, there is a need to better understand the ways by which the school environment may promote or inhibit children's physical activity.

The ecological model of health behaviour proposes that many factors influence our behaviour, from individual and intrapersonal, to environmental and policy (7). In physical activity correlates research in young people, individual factors have traditionally received most attention (8), while there has been a growing interest in neighbourhood variables in recent years (9). Yet children spend large amounts of their time in schools and accumulate a substantial part of their daily physical activity in a school-based setting (10). Despite this, little is known about what attributes of the school environment are associated with children's activity levels. A recent review identified eight studies investigating school-level environmental correlates and concluded that distance to school was negatively associated walking and cycling to school, whereas children who had higher access to activity promoting equipment and facilities were more active (9). A more recent study showed that school campus, building and play areas (expressed as m² per student) were all positively associated with objectively-measured school-based physical activity (11). A similar association was shown in Belgian preschool children (12). Recent work also suggests that availability of physical activity-related facilities and equipment in schools is associated with higher levels of pupils' physical activity during recess (13-15).

Although some recent research has addressed the possible role of the physical environment of the school, the school social and policy environment (such as rules and regulations) has been largely ignored, despite its potential importance (16). In addition, most studies have been conducted in a relatively small sample of schools, with limited variability in the exposure measure, only assessed a small number of exposure variables, and relied upon self-report or observation to measure physical activity behaviour. Moreover, it is likely that different environmental features will influence activity of differing intensities, an issue thus far unexplored in the literature. In this paper we seek to add to the current evidence by studying associations between objectively-measured sedentary, moderate and vigorous activity in a large population-based sample of 9/10-year old children, and factors from the school's physical, policy and social environment.

METHODS

The overall aim of the SPEEDY study (Sport, Physical activity and Eating behaviour: Environmental Determinants in Young people) is to examine individual and collective factors associated with physical activity levels and dietary behaviour in a large population-based sample of British 9-10 year old children (Year 5). The University of East Anglia local ethics committee approved the study. Methods of school and participant recruitment, data collection procedures and data processing have been described in detail elsewhere (17) and only a brief overview is provided below, focusing on the measures used in the current analyses.

Study sample

Schools with 12 or more Year 5 pupils enrolled in the county of Norfolk, Eastern England, were sampled with the deliberate aim of achieving heterogeneity in location. This resulted in an oversampling of rural schools and an under-sampling of schools in urban locations. Of the 157 schools approached, a total of 92 were eventually recruited. They were representative of all eligible schools in terms of pupil ethnicity, percentage of children receiving free school meals, sex distribution, number of Year 5 children and obesity prevalence in Year 6 (17).

All Year 5 children within participating schools (N=3619) were invited to take part. Each child was given an information pack containing a leaflet for themselves, a letter for their parents/guardians, and a consent form. Only children with a fully completed consent form (signed by both a parent/guardian and the child) on the day of measurement were included in the study. A total of 2064 children took part (57.0% response rate).

Data collection

Measurement procedures—Data collection was performed during the summer term of 2007 (April to July). Teams of two or more trained research assistants performed measurements at participating schools according to standard operating procedures and fitted children an accelerometer.

Outcome measure – physical activity—Free-living activity was assessed over one week with the ActiGraph accelerometer (GT1M, Actigraph LCC, Pensacola, US), which was set to measure at 5-second intervals. The children wore the accelerometer during waking hours on an elastic waistband on the right hip, except whilst bathing and during other aquatic activities. Data were downloaded to a computer upon receipt and data quality was checked. A bespoke programme was used for data reduction and further analyses (MAHUFFe, available from <http://www.mrc-epid.cam.ac.uk/Research/PA/Downloads.html>). The first day of data collection (day of measurement at school) was removed from all files and 10 minutes of continuous zero counts were classified as ‘non-wear time’. Three outcome variables were calculated, indicating the average number of minutes children spent in sedentary (< 100 counts/minute), moderate (2000–3999 counts/min) and vigorous (>4000 counts/min) activity during the school day (18, 19). These thresholds were previously used to study associations between PA intensity and adiposity (20). The school day was defined as the period between 8am and 4pm on weekdays, encompassing the entire school day for all participating schools and also including most of children’s travel to and from school. Children who did not manage to record valid data for at least 500 minutes on at least 2 weekdays were excluded from further analyses.

Exposure variables at school level

– **Questionnaire:** A questionnaire asking about school-related policies, practices and facilities relating to physical activity and dietary behaviour was distributed to the school head teachers. No previously published self-report measure was available and new questions were developed based on previous evidence and hypothesized associations. Table 1 describes the relevant physical activity variables assessed; a copy of the full questionnaire is available from the corresponding author upon request. All 92 schools returned the questionnaire.

– **School grounds audit:** To assess the environmental characteristics of the external school grounds, an audit tool was created, partly based upon previously developed instruments (12, 21). The development, reliability and validity of the instrument has been detailed elsewhere

(22) and only a brief description is provided below. Each school was audited by one trained auditor at either the measurement day or pack collection day a week later.

The school grounds audit consisted of 44 items, and aimed to record details of six components; 'walking provision', 'cycling provision', 'sports and play provision', 'other facility provision', 'design of the school grounds', and 'aesthetics'. For the first four components, relevant facilities were recorded if they were provided in the school grounds or, where appropriate, if they were visible from one of the entrances to the school. Some facilities, such as cycle racks were included in more than one component. Examples of relevant facilities include traffic calming schemes, marked pedestrian crossings and the existence of a traffic calming scheme for 'walking' and 'cycling provision', the latter being supplemented with the availability of cycle lanes and cycle parking. Amongst others, availability of playground equipment and bright markings on play surfaces contributed to the 'sports and play provision' score, whereas the availability of benches, drinking fountains or wildlife gardens were included in the 'other facility provision' score. The 'design of the school grounds' component recorded characteristics of the grounds that determined how suitable they may be for sports, informal games or general play. Suitability was scored on a three-point scale; 'very', 'somewhat', or 'not at all'. Nine items were used to define the 'aesthetics' component. Six of these (the presence or absence of trees, graffiti, planted beds, outdoor art, noise and litter) were scored on a three point scale ('a lot'/'some'/'none'). The maintenance, seclusion and vandalism of the school grounds were measured by indicating agreement on a 5-point Likert scale (ranging from 'strongly disagree' to 'strongly agree').

- Other school-related data: Norfolk County Council provided data on all Local Authority (state) schools. This included the postcode, number of pupils and participation in the Healthy Norfolk Schools programme (23). Similar data on independent (private) schools was provided by the Independent Schools Council or directly obtained from schools. An urban/rural classification of the schools was determined using Bibby and Shepherd's classification of rurality (24), with four density profiles, ranging from 'hamlet & isolated dwelling' to 'urban, >10,000 inhabitants'. To assess the available space for play, head teachers were asked to indicate the area Year 5 children were allowed to play in on a fine day in the summer on a map of the school and surrounding area. This was then manually digitised into a Geographic Information System (ArcGIS), allowing the total area (m²) to be computed which was subsequently divided by the total number of pupils at the school to obtain play area per child.

Covariates—The child's sex and BMI were assessed as potential covariates. Portable Leicester height measures were used to measure height to the nearest millimetre. A non-segmental bio-impedance scale (Tanita, type TBF-300A) was used to measure weight (to the nearest 0.1 kilogram). Children were measured in light clothing without shoes and socks. Body mass index (BMI) was calculated as weight (in kilograms) divided by height squared (in meters). Obesity status was determined using gender- and age-dependent cut point (25).

Statistical analyses

Because data were collected at two levels (child and school), multilevel modelling was used. Simple and multiple multilevel linear regression models were constructed using STATA (version 10.1), using the 'xtmixed' command. First, school-level variance in the outcome measures was estimated in three separate baseline models, solely adjusted for child's sex and BMI (calculating the intraclass correlation coefficients (ICCs)). Second, the association between each exposure variable and each outcome measure was assessed in these baseline models. Third, individual factors with a p-value of less than 0.1 were included in multiple models using a manual backwards stepwise method, retaining only those variables with a p-

value of less than 0.05. Interactions between the exposure variable and sex were explored at this stage. Finally, ICCs were re-calculated using these final models.

RESULTS

Of 2064 participating children, 2043 returned the Actigraph accelerometer (99.0%), with 1908 (92.4%) providing valid data. No differences were observed between children with and without valid data for BMI, overweight status, or age. However, boys were less likely to provide valid data than girls ($p=0.012$). Table 2 shows the characteristics of the participants included in the analyses. Between 8am and 4pm, children spent on average 297.4 (SD: 26.5), 29.7 (SD: 8.45), and 13.9 (7.04) minutes in sedentary, moderate and vigorous activity, respectively. In the baseline model, the ICCs for time spent in sedentary, moderate and vigorous activity were 0.22, 0.13 and 0.09, respectively.

Tables 1 and 3 report the descriptive data for the exposure variables collected via the questionnaire and the other data sources, respectively. Children had a mean of 75.6 (SD: 10.9) minutes of break time per day and 70.6% of the schools allowed children to undertake screen-based activities during that time. Almost all schools offered cycle training and reported having a travel plan, whereas only a few reported having a park and stride area or a walking bus.

Patterns of associations in the simple regression models differed by the outcome measure studied (data not shown). Only the number of sports facilities overall and the number of sports facilities of high or medium quality were positively associated with both moderate and vigorous physical activity. None of the objectively-assessed variables were associated with either sedentary or vigorous activity, whereas all provision measures were associated with moderate activity at $p<0.1$. Based on these results, 4 factors associated with sedentary activity, 9 factors with moderate activity and 6 with vigorous activity (all with $p<0.1$) were entered into multiple multilevel regression models.

Table 4 shows estimates from these final models. In these models, the ICCs for time spent in sedentary, moderate and vigorous activity were 0.21, 0.10 and 0.05, respectively. Having a park and stride scheme was negatively associated with sedentary activity, whereas provision of a lollypop person and objectively-assessed walking accessibility were positively associated with moderate activity. No interactions with sex were observed for these two models. Three variables were significantly associated with time spent in vigorous activity, two positively (provision of sports facilities of high or medium quality and provision of pedestrian training) and one negatively (having a written or informal policy for physical activity). A negative interaction between sex and provision of pedestrian training was observed (interaction coefficient: -1.58 minutes, 95% CI: -2.76 ; -0.40). Stratified analyses showed that provision of pedestrian training was significantly associated in boys (B: 1.89 minutes, 95% CI: 0.77; 3.01), but not in girls (B: 0.31 minutes; 95% CI: -0.75 ; 1.37).

DISCUSSION

As children spend large amounts of their waking hours at school, the school setting has been suggested as a major influence on children's activity levels. With this study we aimed to add to the limited evidence base on school-level correlates of physical activity by studying a large population-based sample of children from both urban and rural areas, assessing activity levels of different intensities objectively and investigating a large number of exposure variables that were generated using various methods. Only a few factors were shown to be associated with time spent in sedentary, moderate and vigorous activity during the school day. Surprisingly, many previously reported associations with physical activity were not

replicated in this study, such as the availability of specific sports facilities (14, 15), play area size and density (11, 26), or area type (26). In addition, only physical environmental features were shown to be associated; none describing the social environmental were.

This is the first study to look at school-level influences on sedentary activity. We observed that children spent large amounts of school-time being sedentary (62.0% of school-based time) and a significant proportion of the variance was explained by the school (ICC of 0.22). This was much higher than for moderate or vigorous activity, indicating that the time spent sedentary is more dependent on the school, than the time spent in moderate or vigorous activity. Only one factor studied here was shown to be significantly associated with this outcome. This travel-related variable, the availability of a 'Park and stride' scheme, was associated with less time spent on sedentary activity. Only 17.4% of schools reported having this facility, so this may be a scheme worth promoting more widely. The lack of significant associations with sedentary time indicates that the high proportion of variance explained by the school may be related to the timetable or how activities are organised within classes. If targeting reductions in sedentary time during school hours is to be achieved, future work should aim to incorporate more sedentary-specific exposure variables and consider time-table related variables.

Some variables related to walking or cycling to school were shown to be associated with activity of moderate intensity. Walking and cycling to school is classified as a moderate activity for young people (27) and has been shown to be associated with higher levels of moderate-to-vigorous physical activity (28). As traffic safety is a main concern for parents and associated with children's travel mode to school (29), it is encouraging to observe that factors in place to improve safety appear to be associated with higher levels of moderate activity. Less than half of the head teachers reported having a lollypop person to help children cross the roads near school safely. However, further longitudinal or intervention research is needed to investigate whether extending the provision of a lollypop person will indeed increase active travel and with that moderate activity in children.

Having either a written or informal policy on the promotion of physical activity was associated with less time spent in vigorous activity, an unexpected result. It may be that schools aiming to increase sports participation (the most likely source of vigorous activity in children) (27) decide to take action by setting up a physical activity promotion policy, for example. This issue could be further explored using qualitative methods. However, whether this is effective in increasing children's physical activity is unknown. Based on the results from these cross-sectional analyses it is not possible to draw conclusions on causal relationships and further work using prospective and intervention designs may be required to explore this issue further. The availability of medium or high quality sports facilities, as reported by the head teacher, was positively associated with time spent in vigorous activity. Interestingly, only the availability of higher quality facilities, not the total number of facilities, was found to be associated, suggesting that quality may be an important factor to consider. Lastly, the provision of pedestrian training was shown to be associated with higher levels of vigorous activity in boys only. Pedestrian training is usually offered to younger children and this may have increased children's and parents' confidence in the child's ability to travel independently, which has been shown to be associated with higher activity levels, and boys are more likely than girls to be allowed to travel independently (30). However, it is unclear why this would be associated with vigorous and not moderate activity, although previous work has indicated that boys tend to walk more vigorously than girls (31).

Although the size of associations observed in this study may appear small, they represent an important contribution to children's activity levels. For example, the observed association between walking provision and moderate intensity activity would potentially mean a

difference of 6.8 minutes of moderate intensity physical activity during school time between children attending the schools with the lowest and the highest scores. This equates to 22.9% of the average number of minutes spent in moderate intensity physical activity (which is 29.7 minutes). Future work, however, may want to take other potential correlates of children's physical activity into account, such as attitudinal and family factors, in order to create a more comprehensive overview of the correlates of children's physical activity.

Strengths of the current study include the large population-based and representative sample of children (17), recruited from a large number of schools, the use of an objective measure of physical activity, the use of valid and objective measures of the exposure where possible and the inclusion of a variety of novel exposure variables (such as the social environment). However, several limitations should be noted. We conducted a large number of tests so we therefore cannot rule out the possibility that some of the associations observed are chance findings. In addition, no causality can be inferred from these cross-sectional analyses. Despite the 57% response rate, our sample has been shown to be broadly representative of the Norfolk population, although an underrepresentation of obese children was observed (17). This may have resulted in less variability in the activity-related outcome measures. In addition, some selective drop out in these analyses limits the generalizability of the results, with girls more likely to provide valid data than boys. Although we used objectively-assessed exposure variables where possible, we also made use of some self-reported data, which was unvalidated. Our validity work of the school audit showed adequate construct validity, with simple, unadjusted analyses showing that the 'walking' and 'cycling provision' scores were associated with MVPA during 'commuting time' and that the 'design of school grounds' score was associated with girls' MVPA during 'lunch time' (22). It is unknown whether the improved statistical analyses or the use of different outcome measures contributed to the different associations observed here. The use of objective measurement of physical activity reduces the error and bias commonly associated with self-reported measures. However, the limitations of accelerometry should also be considered. This includes its poor recording of activity associated with cycling behaviours and the lack of assessment of water-based activities (32). In addition, no consensus currently exists over what thresholds to use when defining sedentary, moderate and vigorous activity. Using the thresholds applied in the current analyses, we have previously shown associations with adiposity in this sample (20). In addition, we did not assess what equipment or supervision was actually available to the children during break time, variables previously shown to be associated with children's activity levels during break times (12, 26). Lastly, our measurements were conducted during the summer term only, which may have affected our findings. During this time children are more likely to play outside, and this has been shown to be associated with higher activity levels (8), which this may have limited the variability in our outcome variable. The lighter evenings at this time of year also provide additional opportunities for the children to play outside after school, potentially decreasing the importance of facilities provided at school.

CONCLUSION

Few school-level factors were shown to be associated with objectively-measured sedentary, moderate and vigorous activity in this large representative sample of British school children, despite significant amounts of the variance being explained by the school. This provides us with few pointers for potential future intervention efforts. Previous studies using objective measures of physical activity also appear to be less likely to report many significant associations (33, 34), although the precise reasons for this remain unknown. Further research should continue to focus on using objective measures of domains of activity and school-level factors in different populations to elucidate what factors may explain the school-level variance in activity levels.

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Table 1

Description of variables and results of data collected using questionnaire completed by head teacher.

Variable	Proportion /mean (SD)	Assessment
<i>Length of breaks in minutes</i>		Duration of break were reported and added to obtain total break time.
- morning break	15.8 (2.0)	
- lunch break	57.7 (7.2)	
- afternoon break *	19.5 (20.1)	
- total over day	75.6 (10.9)	
<i>Number of sports facilities at school</i>	5.8 (1.1)	Reported access of the school to nine sport-related facilities, including a gym hall, swimming pool, playground, sports equipment or local park. Available facilities were summed (possible score: 0-9).
<i>High/medium sports facilities at school</i>	4.9 (1.4)	Rating of the quality of the available facilities (high/medium/low). Facilities scored as medium or high quality were summed (possible score: 0-9).
<i>Physical education provision (hrs/week)</i>	2.09 (0.52)	Reported rounded to the nearest ½ hour.
<i>Compulsory swimming classes (hrs/year) **</i>	10.17 (6.19)	Reported rounded to the nearest ½ hour.
<i>Provision of extracurricular PA</i>	1.9 (0.8)	The availability of extracurricular activities before school, during lunch breaks, after school and at weekends were reported separately. A summary score (possible score: 0-4) was created by adding up the availability at various times of the day and week.
<i>Attitude of school to PA promotion</i>	4.4 (0.9)	Reported agreement with five statements about school attitude to physical activity (5-point Likert scale). Statements included school's view with regards to physical activity promotion at and outside of school, promotion of active travel and education about physical activity safety and health risks of inactivity. Scores were summed and averaged.
<i>Break time outdoor play allowed, irrespective of weather</i>	14.1%	Choosing one of five options reflecting outdoor policy during break time. The answers were collapsed into a dichotomous category.
<i>Activity during breaks</i>		Report of whether children are allowed to do screen-based activities (use computer, watch TV) or physically active activities (use of sports equipment, ball games indoors/outdoors, running game indoors) during break time. Answer options included 'yes, always'; 'yes, in bad weather'; 'never', the first two were combined. Number of activities allowed were subsequently summed.
- screen-based activities (% 1)	70.6%	
- physically active activities (% 2)	56.5%	
<i>Active travel facilities (summary score)</i>	5.1 (1.6)	Reported availability of 9 active travel-related facilities.
<i>Individual facilities</i>		
- travel plan (%yes)	85.60%	
- bicycle rack on site (%yes)	88.00%	
- walking bus (%yes)	3.30%	
- park and stride (%yes) †	17.40%	
- walk to school week/day (%yes)	70.30%	
- pedestrian/cycle entrance (%yes)	70.00%	
- lollypop person (%yes) †	40.70%	
- cycle training (%yes)	93.40%	
- pedestrian training (%yes)	47.30%	
<i>Additional education on: (%yes)</i>		'Over and above the basic National Curriculum requirements, does your school provide the children with additional information on the following topics?'
- physical activity	88.1%	
- health promotion in general	78.3%	
<i>Physical activity policy (%yes)</i>	88.7%	'Does your school have a policy to promote physical activity among children (written or informal)?'
<i>School environment</i>	15.4 (2.5)	Reported agreement about the area around the school with 7 statements referring to traffic safety around school (heavy traffic, street safety for walking and cycling, speed of cars), availability of facilities (footpaths, traffic lights, ease of pedestrian access) and aesthetics (level of rubbish). Answers were recorded on 5-point Likert scale, collapsed into three by combining 'strongly disagree'/'disagree' and 'agree'/'strongly agree', and summed.

* data presented only includes those schools that have afternoon breaks for year 5 children (N=10)

^{**} data presented only includes those schools that provide compulsory swimming lessons (N=67)

[†] provision of an area a 5-10 minute walk away from the school where parents can park their cars and walk their children to school.

[‡] someone who helps children cross the roads near their school

Table 2

Descriptive characteristics of study sample (based on individual data).

	Boys	Girls	Total
N (%)	841 (44.1%)	1067 (55.9%)	1908
Age (years)	10.2 (0.3)	10.3 (0.3)	10.3 (0.3)
BMI (kg/m ²)	17.9 (2.9)	18.5 (3.4)	18.2 (3.2)
Weight status (%)			
- overweight only	15.8	19.4	17.8
- obese only	4.1	6.4	5.4
Activity (minutes - 8am-4pm)			
- sedentary	288.1 (25.6)	304.7 (24.8)	297.4 (26.5)
- moderate	33.2 (8.11)	26.9 (7.66)	29.7 (8.45)
- vigorous	17.0 (7.60)	11.5 (5.45)	13.9 (7.04)

Means and standard deviations are presented unless stated otherwise.

Table 3

Characteristics of schools participating in SPEEDY study (N=92)

Variable	Proportion or mean (SD)
School location	
- Urban (>10,000 inhabitants)	32.60%
- Town and fringe	39.10%
- Village	23.90%
- Hamlet & isolated dwelling	4.30%
School type (% state schools)	96.70%
Norfolk Healthy Schools participation (%)	38.20%
School size (median, IQR)	176 (111, 269)
Area of playground available to yr5s (m2)	11557.2 (7205.2)
Area of playground available per child (m2/child)	59.3 (43.1)
Walking provision score (max: 4)	2.1 (0.8)
Cycling provision score (max: 7)	3.5 (1.4)
Sport and play facility provision score (max: 13)	8.1 (1.9)
Other facility provision score (max: 8)	3.5 (1.6)

Abbreviations: IQR: Inter Quartile Range; m2: meters squared; max: maximum.

Table 4

Results from final multiple multilevel linear regression models using minutes of sedentary, moderate or vigorous physical activity during the school day (8am-4pm) as dependent variable.

	Beta coefficient	95%CI
Sedentary activity		
- Park and Stride	-7.74	-14.8; -0.70
Moderate activity		
- Lollypop person	1.33	0.35; 2.62
- Walking provision score	1.7	0.85; 2.56
Vigorous activity		
- High/medium quality sports facilities at school	0.47	0.16; 0.79
- Pedestrian training	1.02	0.10; 1.95
- Written or informal PA policy	-2.28	-3.62; -0.95