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Measuring children's daily play in the CATS study

This is a presentation of the results of a study undertaken by James Paskins, Roger Mackett, Lindsey Lucas and Jill Turbin of the Centre for Transport Studies,University College London. Additional comments in italics.

CATS: Children's Activity and Travel Survey

CATS is one part of **Reducing children's car use: the health and potential car dependency impacts** Funded by EPSRC under the FIT programme. The work was carried out in collaboration with Hertfordshire County Council , health experts, an epidemiologist and a health promotion expert.

Setting the scene:Changes in children's travel

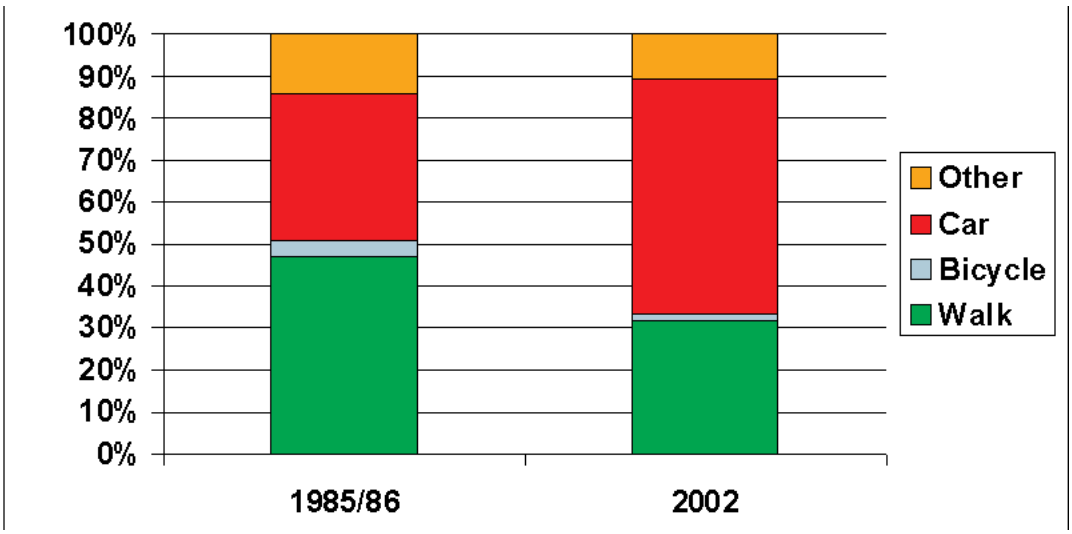
The National Travel Survey tells us that the children are making an increasing proportion of their journeys by car. Children are making fewer but longer journeys. This increase in car use has been at the cost of the active modes: walking and cycling.

Setting the scene: Changes in children's physical activity

The increase in children's car use is occurring at the same time as concerns are being raised about children's physical activity.There is growing concern that decreasing physical activity will lead to increasing obesity and other long term health problems

According to the UK Chief Medical Officer:

8.5% of 6 year olds and 15% of 15 year olds are obese. Between 1996 and 2001 the proportion



of overweight children increased by 7% and obese children by 3.5%. *The first chart shows that, Since 1985/86, there has been a significant change in children's transport mode, with reductions in walking, cycling and other activity, but a major increase in car journeys*

CATS: The sample

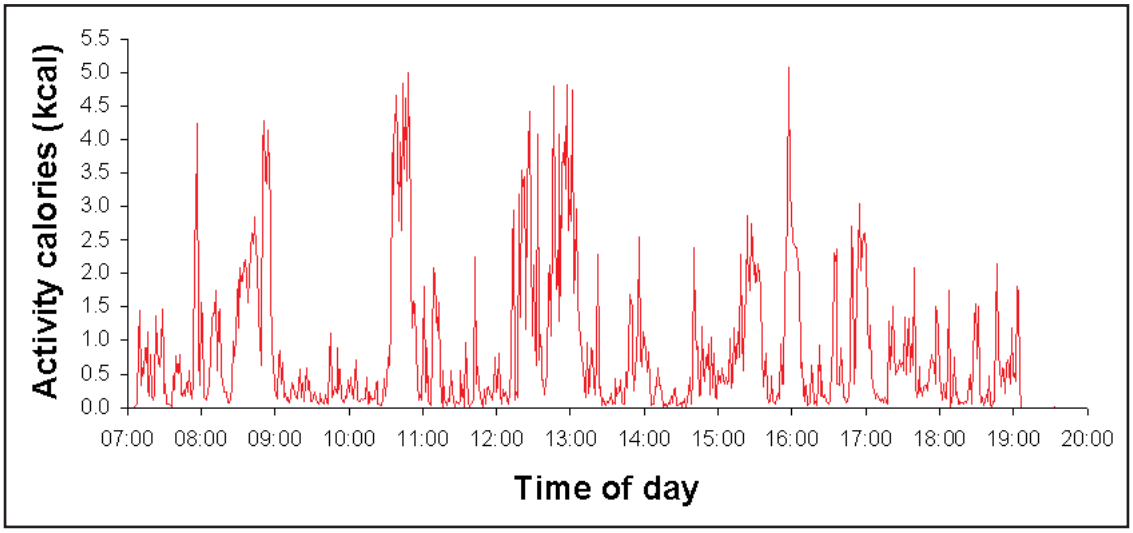
200 children were originally recruited but 5 did not include enough data to be included in the analysis.

	Male	Female	Total
Year 6 (age 10-11)	54	58	112
Year 8 (age 12-13)	42	41	83
Total	96	99	195

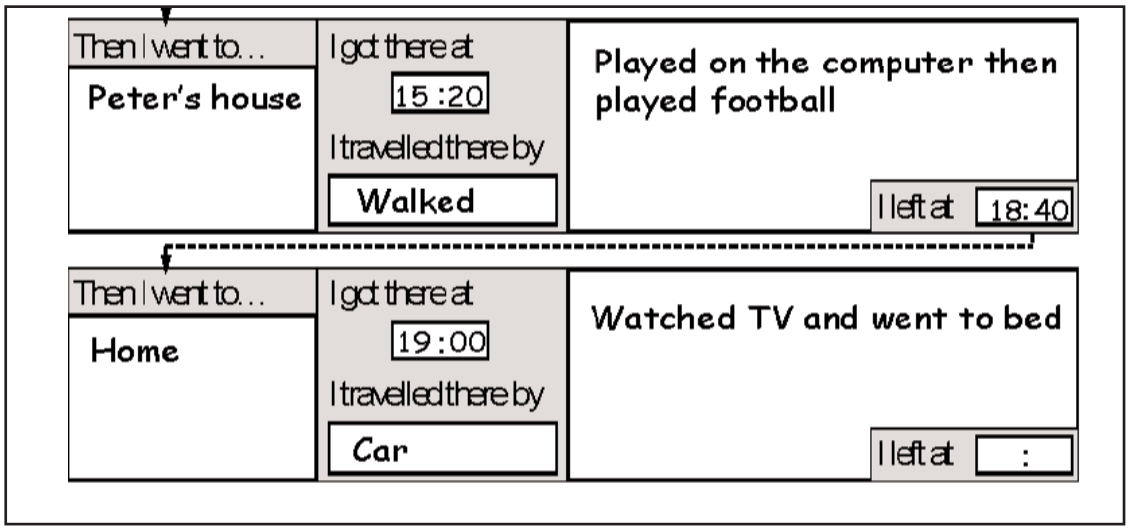
Measuring physical activity: The RT3 motion sensor

The RT3 motion sensor carried by the children taking part in the sample. These devices measured the intensity of any physical activity performed by the children. It was carried typically as shown here affixed round the child's waist.

Measuring physical activity: *Example output from the RT3 motion sensor carried by the children taking part in the sample.*



Measuring physical activity: *A child's travel and activity diary. Children kept a daily diary of their activities.*



Classifying the diary responses At the broadest level there are 8 "event" types used to classify the children's responses. A classification scheme was devised to group similar activities together

○School	○Travel
○Clubs and tuition (structured activities)	○Playing (unstructured activities)
○Being at their own home	○Being at other people's homes
○Out on trips	○Other (physical work and waiting)

Disaggregation of activities

Clubs and tuition (structured activities)	Playing (unstructured activities)
○ Structured ball games	○ Unstructured ball games
○ Other structured sport	○ Other unstructured sport
○ Organisations	○ Other outdoor play
○ Tuition	

Trips per week to various activities

	Walk	Car	Other	Total
School	2.6	1.4	0.5	4.6
Structured	0.3	0.8	0.0	1.2
Unstructured	0.7	0.4	0.0	1.2
Parental	0.6	1.7	0.2	2.4
Other homes	1.5	1.4	0.2	3.1
Other	0.3	0.3	0.0	0.7
Total	5.9	6.1	1.1	13.1

Intensity of activities by children (activity calories per minute)

Mode of travel	Intensity
Walking	2.5
Car	0.9
Bicycle	1.9
Bus	1.5
Overall	1.5

These last two show, as might be expected, that walking is a more calory intensive activity than riding in a car, but it also shows it to be even superior to cycling. One interesting fact is that a Bus trip is also more intensive than a car mainl because prior and after a Bus journey, the child has to walk to and from home/friend/school etc.

Intensity of travel by children (activity calories per minute)

Activity	Intensity
School	1.0
Clubs and tuition	1.9
Playing	1.9
Out on trips	1.1
Own home	0.5
Other homes	0.8
Travel	1.5
Other	1.0
Overall	0.9

This is revealing to the playworker, in that it shows the importance of unstructured play, which, when allied to walking, makes it a high-calory use activity.

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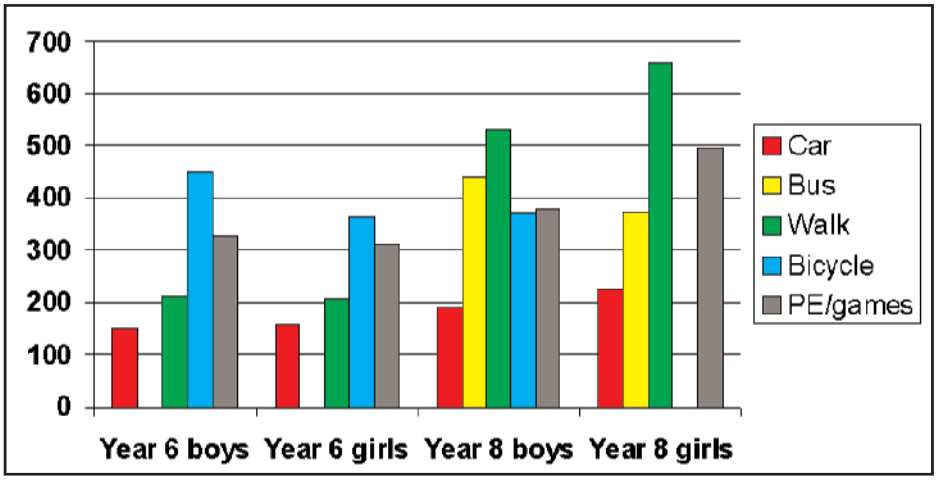
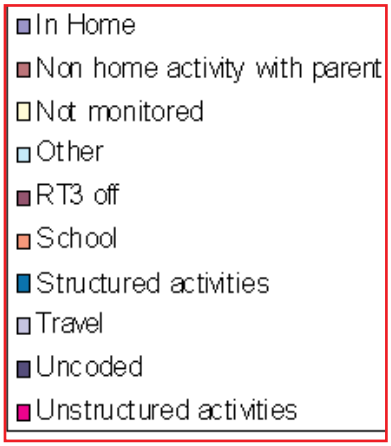
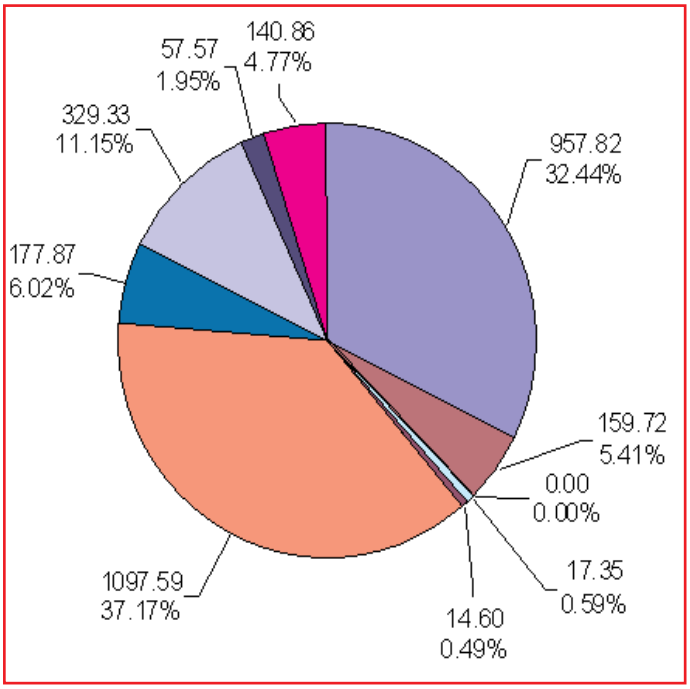
Energy used in a week in school travel compared with PE/games



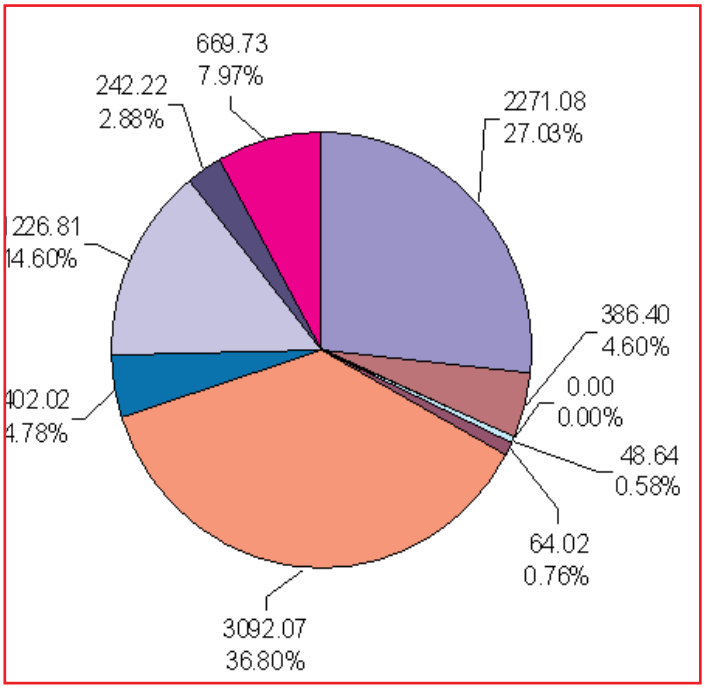


Where do children use their calories?

Children in the least active quartile



Children in the most active quartile



Where do children use their calories?

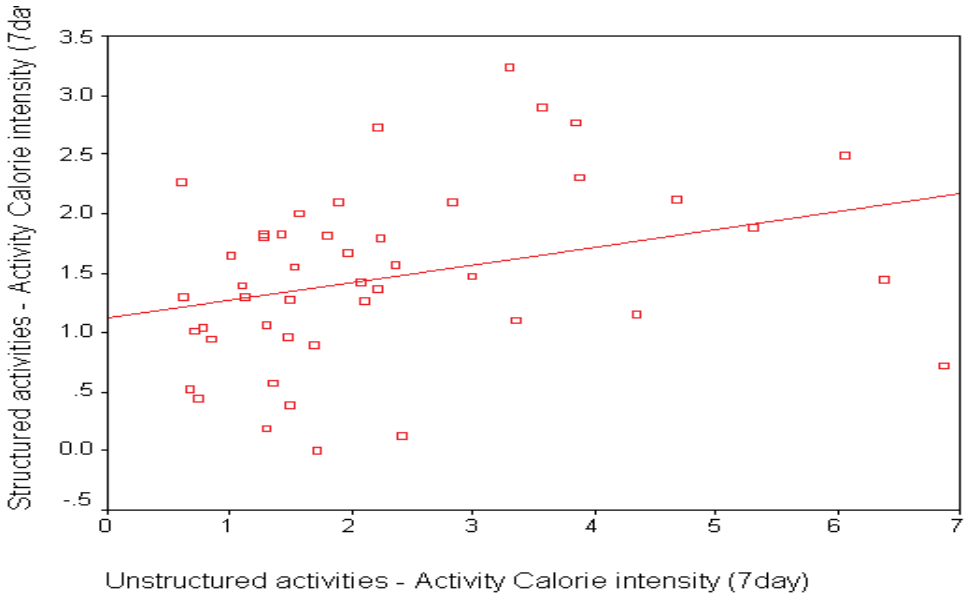
Compared to those in the least active quartile, those in the most active quartile: expend more calories in unstructured events; expend less calories at home; expend less calories in structured events.

Comparing structured and unstructured events: The sample

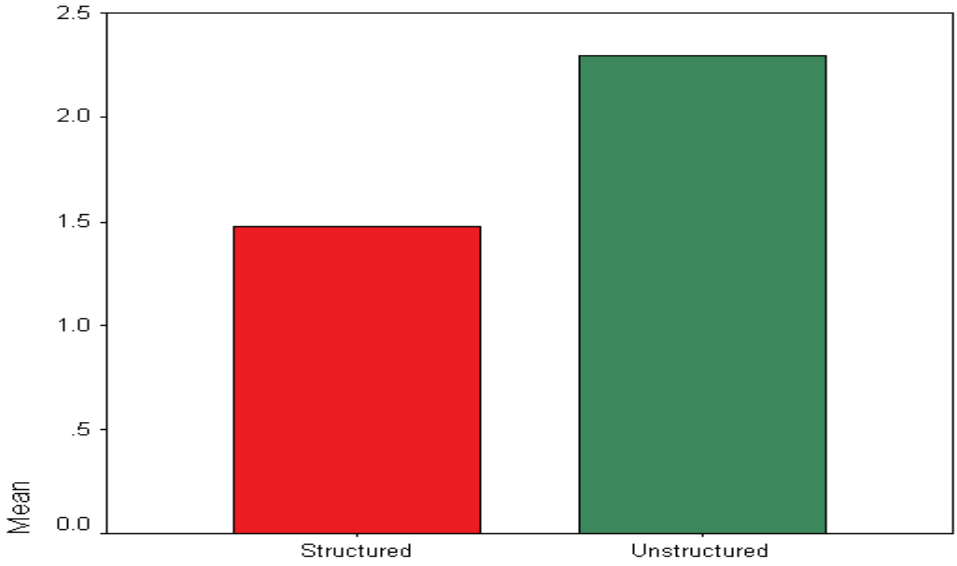
	Male	Female	Total
Year 6 (10-11)	8	16	24
Year 8 (12-13)	13	9	22
Total	21	25	46

Only 46 of the 195 children took part in both structured and unstructured events over the 4 days. We can compare intensities and durations for the two event types within this group:

Comparing structured and unstructured events: Intensity of events

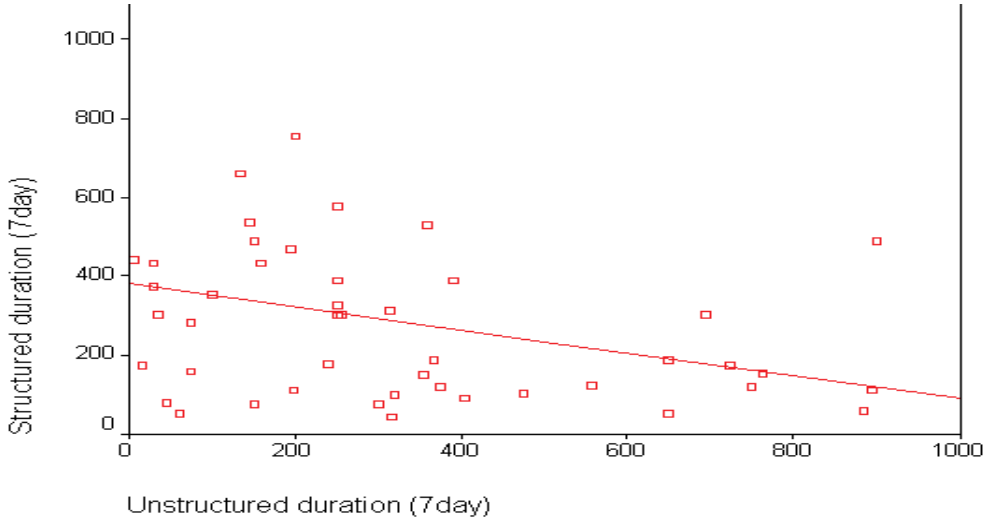


There is a significant positive correlation between the intensity of unstructured events and the intensity of structured events



There is a significant difference between the intensity of unstructured events and the intensity of structured events (for the children who do both types of activity)

Comparing structured and unstructured events: Duration of events



There is a significant negative correlation between the duration of unstructured events and the duration of structured events

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Comparing structured and unstructured events

There is a significant positive correlation for intensity – active children? There is a significant negative correlation for duration - time lost for unstructured play? For those who did both types of activity unstructured events are significantly more intense. NB: Based on a small sub-sample

Conclusions

Children are walking less. Children are getting fatter. This is partly due to increased car use. **Children's physical activity is linked to: Being out of the house; Active modes: walking and cycling; Unstructured play.**

Walking to school can provide significant quantities of exercise (comparable in scale to PE lessons) **The switch from unstructured to structured outdoor activities is leading to more car use.**

All children's activities consume calories, but outdoor activities, including playing, are particularly good. Being at home is associated with low calorie expenditure

Future work

The children's car use project finished at the beginning of 2004. CAPABLE is a new EPSRC funded project that will build on this work. Doubling our activity monitoring sample. Adding information about children's movements, through gps monitoring. Studying the link between physical activity and cognitive skills.

Further information

The project website can be found at **www.cts.ucl.ac.uk/research/chcaruse/**

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