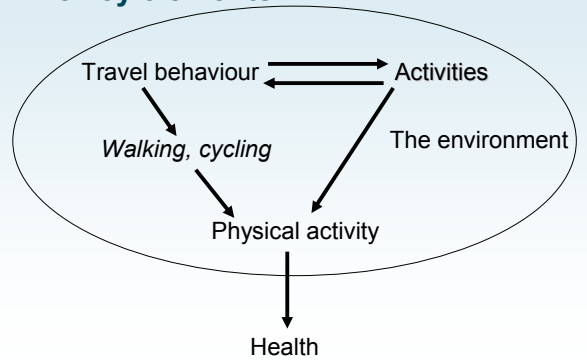


Understanding children's travel behaviour in the local environment: the implications for physical activity and health

Roger Mackett
Centre for Transport Studies, UCL

The key elements

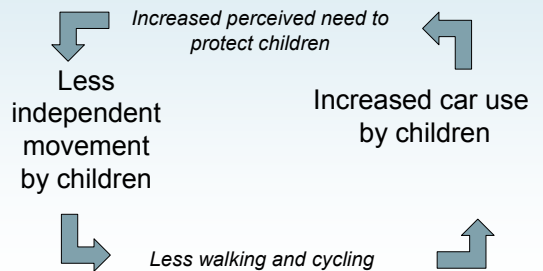


Children's independent movement and car use

Less independent movement by children

Increased car use by children

Children's independent movement and car use



Children's travel

- Mandatory
- Parent-centred
- Child-centred

Children's travel

- Mandatory – travel to school – child has to do it, but there are decisions about mode of travel, timing etc
- Parent-centred – parent decides, child has to follow; may be for the benefit of the child, but may simply be a form of child care
- Child-centred – child decides where and when to go – part of a learning experience

Activities and travel

- Convention – travel to an activity, take part in the activity, travel home
- Or, maybe – several activities, linked together on a tour
- But how do we deal with:
 - Walking the dog
 - Cycling on a car park
 - Roller skating
 - Window shopping, etc
- Separation between travel and activity seems to be less for children than adults

The research projects

Reducing children's car use
 January 2001 – March 2004
 Funded by EPSRC under the Future Integrated Transport programme

Children in Years 6 and 8
 Fieldwork in Hertfordshire

Objectives:

- To look at effects of car use on children's volume of physical activity
- To look at children's car dependency
- To develop a method for evaluating interventions to increase walking

Children's Activities, Perceptions and Behaviour in the Local Environment (CAPABLE)

September 2004 – December 2006
 Funded by EPSRC

Children in Years 4, 5, 6 and 7
 Fieldwork in Hertfordshire and Lewisham

Objectives:

- To understand children use the local environment
- To look at the effects of parental supervision on children's use of the local environment
- To develop methods to measure these

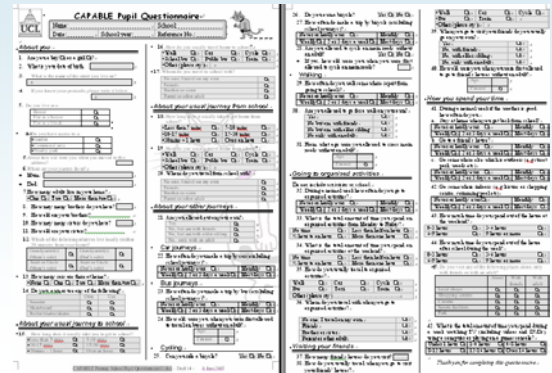
Methodology

Exploratory analysis

We have used various techniques to collect data on:

- Their characteristics
- Their parents' characteristics
- What the children did
- Who went with them
- Where they went
- How active they were

We asked the children's questions



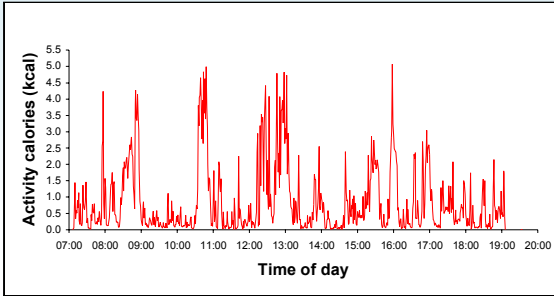
and their parents



We measured how active the children are, using RT3 motion sensors...



which produce a trace like this...



We asked them to keep travel and activity diaries...

Location		What did you do there?	
I began the day at	I woke up at		
Home <input type="checkbox"/>	<input type="text"/>		
Somewhere else <input type="checkbox"/>	I put my sensors on at		
Please say where	<input type="text"/>		
		I left at <input type="text"/>	
Morning	Then I went to	I got there at	<input type="text"/>
		I travelled by	<input type="text"/>
		I travelled:	<input type="checkbox"/> by myself <input type="checkbox"/> with an adult <input type="checkbox"/> with other children
		I left at <input type="text"/>	
	Then I went to	I got there at	<input type="text"/>
		I travelled by	<input type="text"/>
		I travelled:	<input type="checkbox"/> by myself <input type="checkbox"/> with an adult <input type="checkbox"/> with other children
		I left at <input type="text"/>	

The activities in the diaries were classified

- Based on the children's responses
- 3 level classification:
 - 8 categories at the broad level
 - 18 categories at the middle level
 - 56 categories at the narrow level
- Intensities in activity calories per minute can be calculated for each category

We weighed and measured them...



We fitted them with GPS monitors...



which they seemed to enjoy...



This gives us plots like this of a boy aged 10 walking to school in Cheshunt

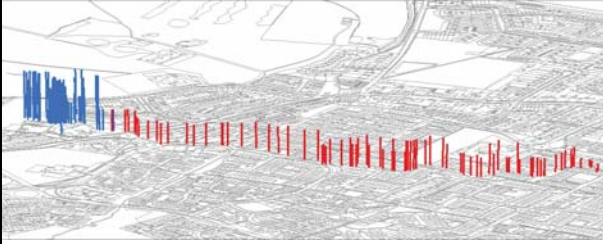


We can map the GPS and activity data



Or in three dimensions

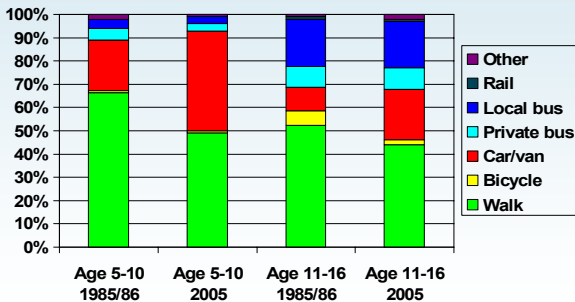
Walking (in red) and playing football (in blue)
The more active the child is, the taller the line



The themes to be examined

- Changes over time in car use
- Why do children travel?
- The effects of car use on children's volume of physical activity
- The factors influencing children's independence
- The influence of independence on where children go
- The effects of accompaniment on children's walking
- Children walking and activity in the local environment

Modal split to school



Source: National Travel Survey

Mean distance between home and school

	1985/86	2005
Children aged 5-10	1.1 miles (1.8 km)	1.5 miles (2.4 km)
Children aged 11-16	2.3 miles (3.7 km)	3.0 miles (4.8 km)

Source: National Travel Survey

Mode of travel to school by children compared with that used by their parents at the same age (%)

		Mode used by child now			
		Walk	Car	Other	All
Mode used by parent when a child	Walk	31	23	16	70
	Car	3	2	2	7
	Other	9	7	7	23
	All	43	32	25	100

Source: Parents' questionnaires

Mode of travel to school by children compared with that used by their parents at the same age (%)

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		Walk	Car	Other	All
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	Car	3	2	2	7
	Other	9	7	7	23
	All	43	32	25	100

Source: Parents' questionnaires

Distances that parents travelled to school compared with their children, at the same age

Significantly less	16
Less	14
About the same	22
Further	27
Significantly further	21
Total	100

Source: Parents' questionnaires

The purpose of car journeys that take children to or from school

	To school	From school
Part of a journey to or from work	50	35
Combined with another school/nursery trip	8	10
Combined with a trip to or from somewhere else	10	10
School journey sole purpose of trip	32	44
Total	100	100

Source: Parents' questionnaires

Activities per week classified by method of travel

	Walk	Car	Other	Total
School	2.6	1.4	0.5	4.6
Clubs & tuition	0.3	0.8	0.0	1.2
Playing	0.7	0.4	0.0	1.2
Out on trips	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

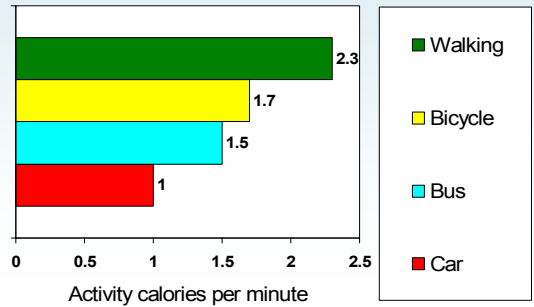
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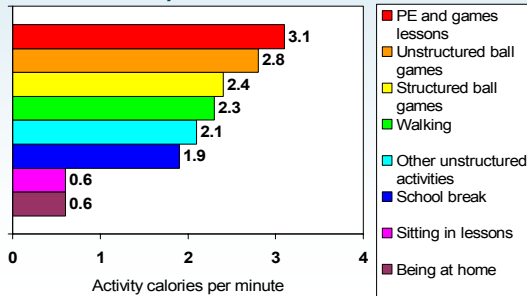
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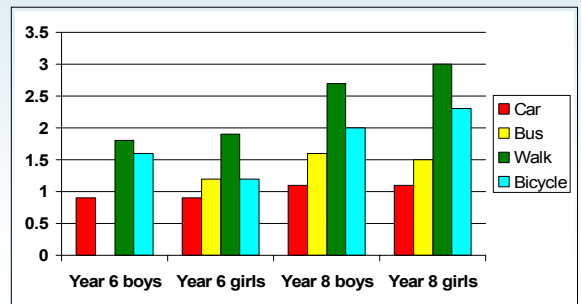
Intensity of modes of travel used by children



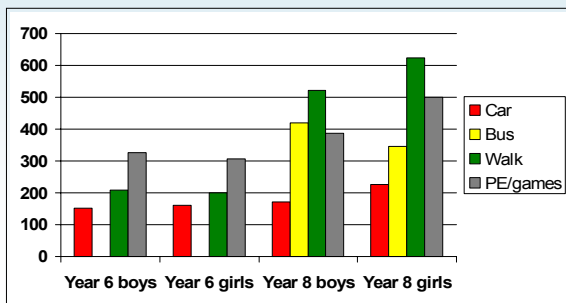
The extremes of physical activity in children's lives (middle level of classification)



Intensity of children's travel (activity calories per minute)



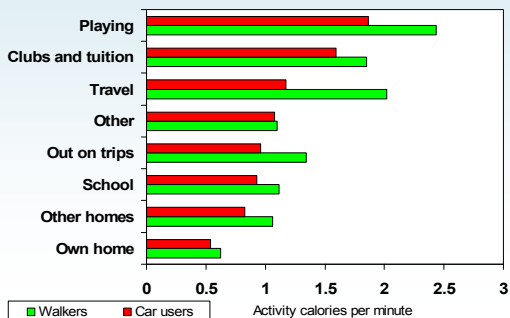
Energy used in a week in school travel compared with PE/games



Intensity of activities classified by method of travel used

	Walk	Car
PE and games	3.5	2.4
Other lessons	0.6	0.5
School break	2.0	1.7
Clubs & tuition	1.7	1.6
Playing	2.4	2.0
Out on trips	1.5	1.0
Other homes	1.1	0.8
Overall	1.7	1.3

Intensities for children spending more time walking or more time in the car

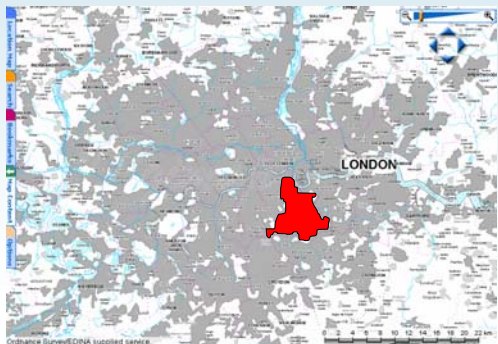


Children's independent travel



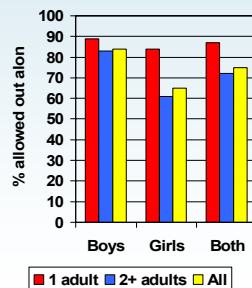
- Based on questionnaires answered by children;
- Surveys conducted through schools in Lewisham;
- Results are for 383 Year 7 children (aged 11-12) - 194 boys, 189 girls.

Where is Lewisham?



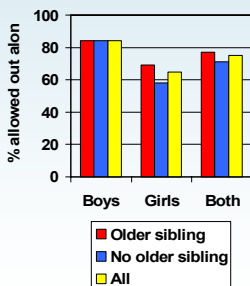
Effect of the number of adults at home

- More children from households with one adult at home are allowed out alone than those from other households.



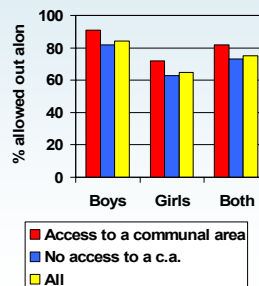
Effect of having an older sibling

- More girls with an older sibling are allowed out alone than those without;
- Similar proportions of boys with and without an older sibling are allowed out alone.



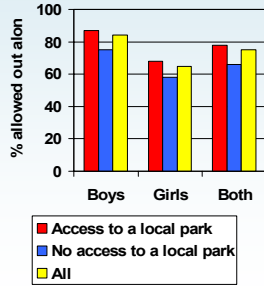
Effect of having access to a communal outdoor area

- More children living in dwellings with access to a communal outdoor area are allowed out alone than those without such access.



Effect of having access to a local park

- More children living in dwellings with access to a park are allowed out alone than those without such access.



Where do children go?

% of children who go to various places

	Boys	Girls
Local shops	92	93
Shopping centres	87	96
Cinema	86	92
Sports facilities	80	76
Park	84	72

Does being allowed out alone encourage boys to go to places?

	Boy allowed out alone?	
	Yes	No
Local shops	95	77
Shopping centres	89	77
Cinema	88	74
Sports facilities	83	65
Park	88	61

Does being allowed out alone encourage girls to go to places?

	Girl allowed out alone?	
	Yes	No
Local shops	95	89
Shopping centres	96	97
Cinema	93	89
Sports facilities	79	71
Park	84	50

The children in the Cheshunt sample

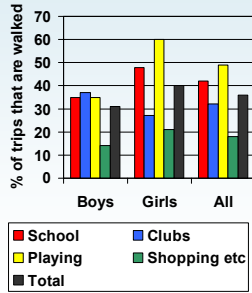
	Boys	Girls	Total
Year 4 (aged 8-9)	25	32	57
Year 5 (aged 9-10)	33	36	69
Year 6 (aged 10-11)	16	20	36
Total	74	88	162

The study area - Cheshunt, Herts



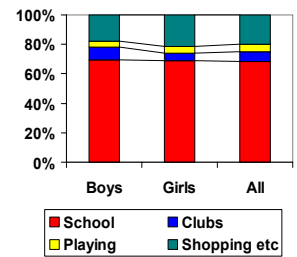
Percentage of trips to events that were walked

- 36% of the children's trips were walked.
- Girls walked to more events than boys.



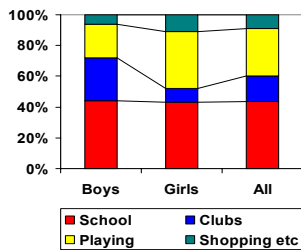
The distribution of events that children walk to with an adult (%)

- School dominates the type of walking trip that children do with an adult.
- Shopping etc trips comes second, because many of these trips are made for the benefit of adults.



The distribution of events that children walk to without an adult (%)

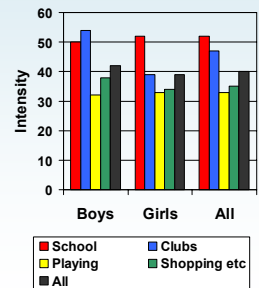
- School is the main type of walking trip that children make without an adult.
- Playing comes next, in total and for girls.
- Boys also walk to after-school clubs without an adult.



Intensity of walking to events

(in 10⁻² activity calories per kg of body weight)

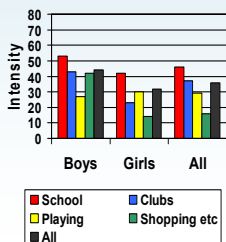
- Boys use more energy than girls when walking.
- Walking to school tends to be the more intensive type of walking.
- But, boys tend to walk even more intensively when walking to clubs.
- Walking to play tends to be the least intensive.



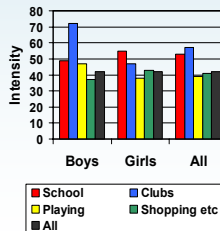
Intensity of walking to events

(in 10⁻² activity calories per kg of body weight)

Not accompanied by an adult



Accompanied by an adult



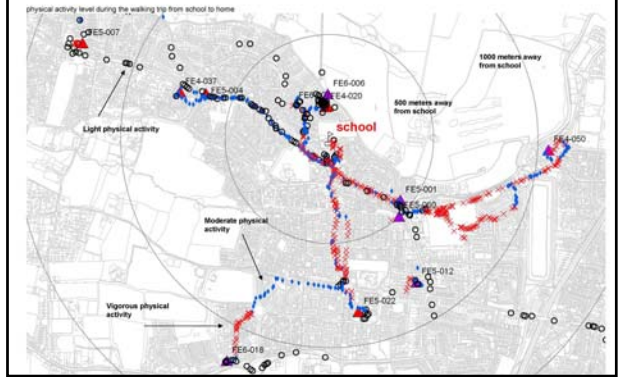
The effects of accompaniment on speed (metres/second) when walking

	Boys	Girls	Both
With an adult	1.3	1.1	1.1
With an adult and other children	0.8	1.0	0.9
With other children	-	0.3	0.3
Alone	0.4	0.6	0.4

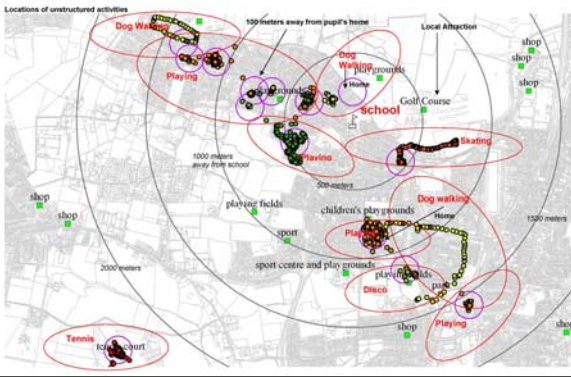
The effects of accompaniment on angular movement

	Boys	Girls	Both
With an adult	39	34	37
With an adult and other children	47	39	51
With other children	-	73	73
Alone	74	55	69

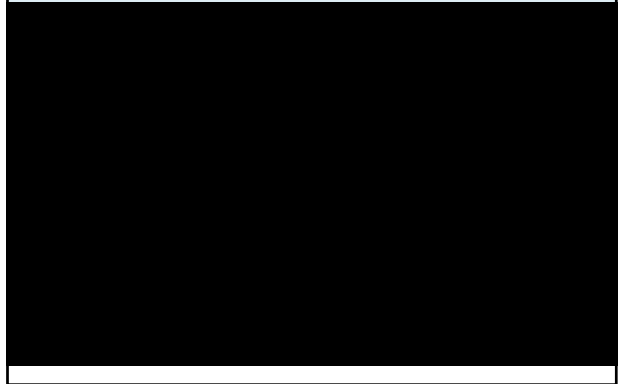
Physical activity levels walking home from school



The location of unstructured activities



Walking home from school



Walking the dog

Football, and then back to the car



Summing up...

- Children are walking less than they used to
- They are less active because of more car use and being allowed out alone less
- Car use has a complex effect of the quantity of physical activity
- Children who are allowed out without an adult go to more places locally
- Children 'potter' about more when there's no adult there

Where to next?

- Further analysis of existing data
- Statistical testing where possible
- Further research:
 - More systematic measurement of the local environment
 - Comparisons with other environments
 - Look at whole households
 - Use the methods with other population groups