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Measuring the outcomes from active transport interventions for children

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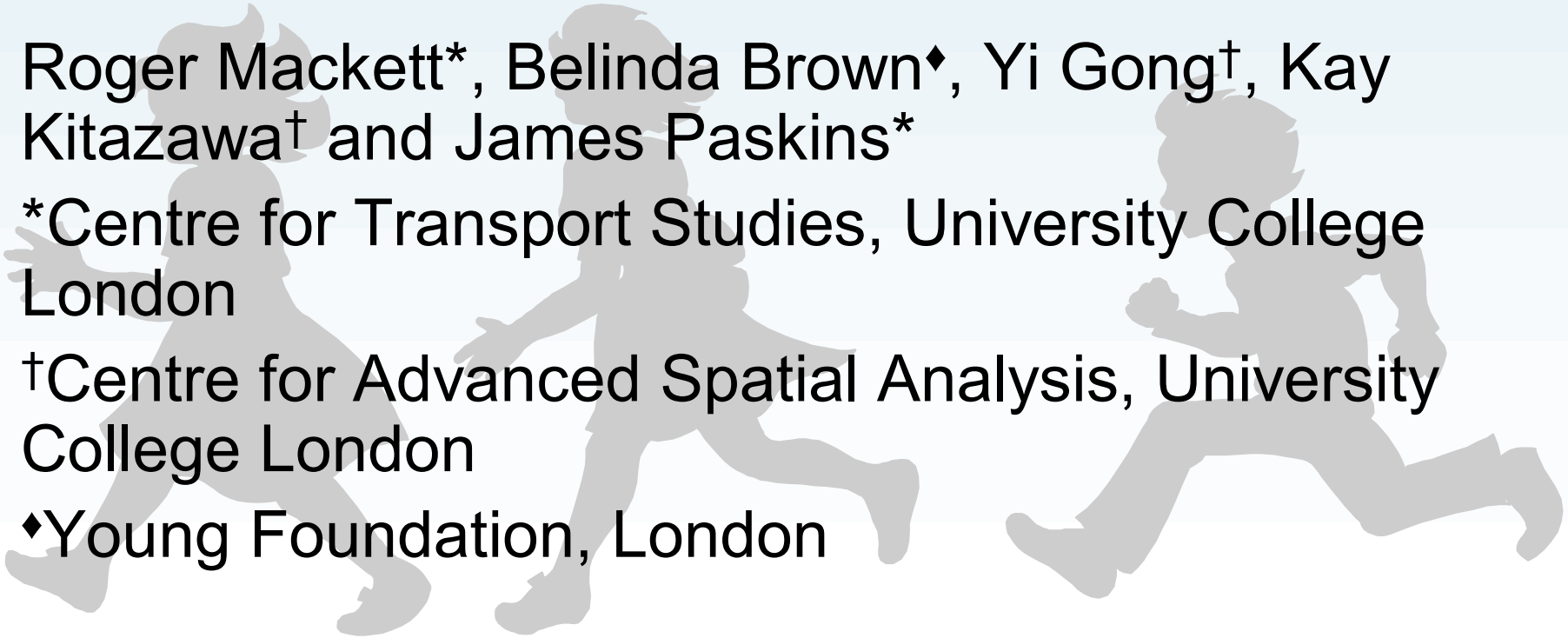


The research

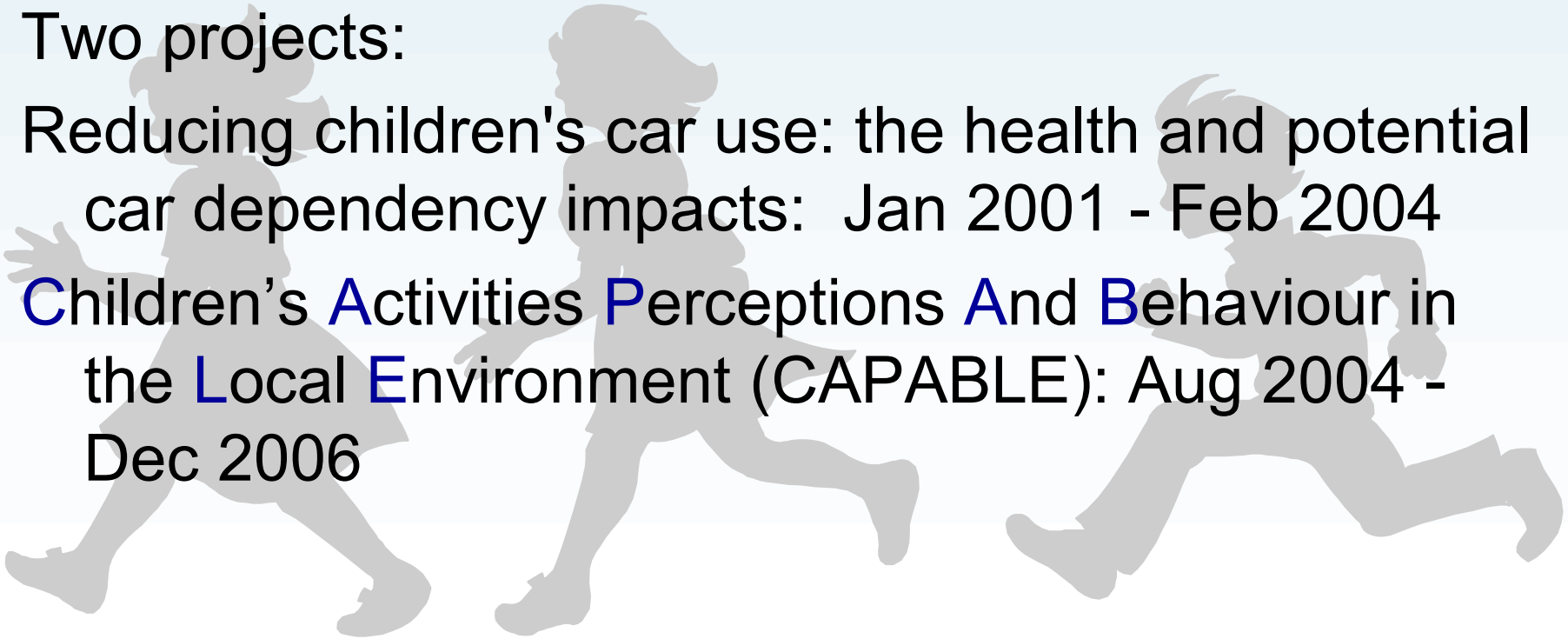
Carried out at University College London (UCL)

Funded by the UK Engineering and Physical Sciences Research Council (EPSRC)

Two projects:

Reducing children's car use: the health and potential car dependency impacts: Jan 2001 - Feb 2004

Children's Activities Perceptions And Behaviour in the Local Environment (CAPABLE): Aug 2004 - Dec 2006



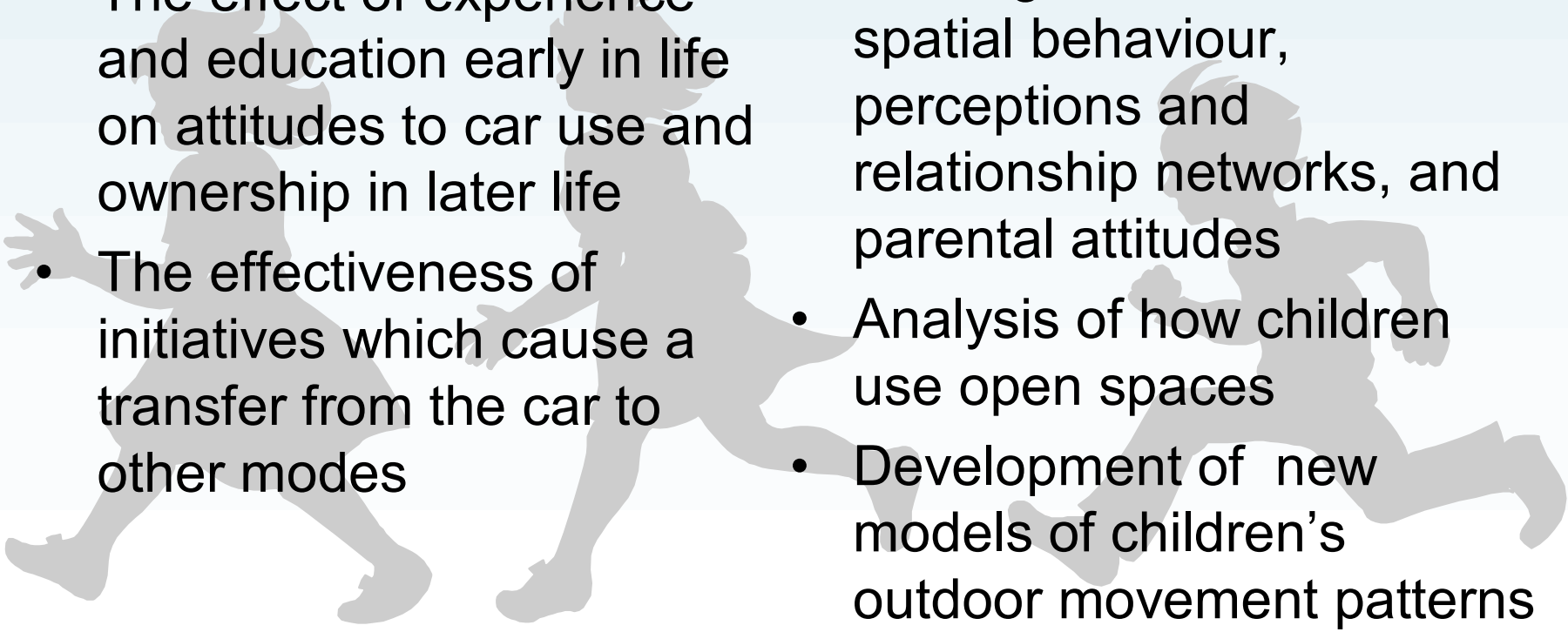
Issues being addressed in the projects

Children's car use project

- The contribution of walking to children's health
- The effect of experience and education early in life on attitudes to car use and ownership in later life
- The effectiveness of initiatives which cause a transfer from the car to other modes

CAPABLE

- The development of research tools to investigate children's spatial behaviour, perceptions and relationship networks, and parental attitudes
- Analysis of how children use open spaces
- Development of new models of children's outdoor movement patterns



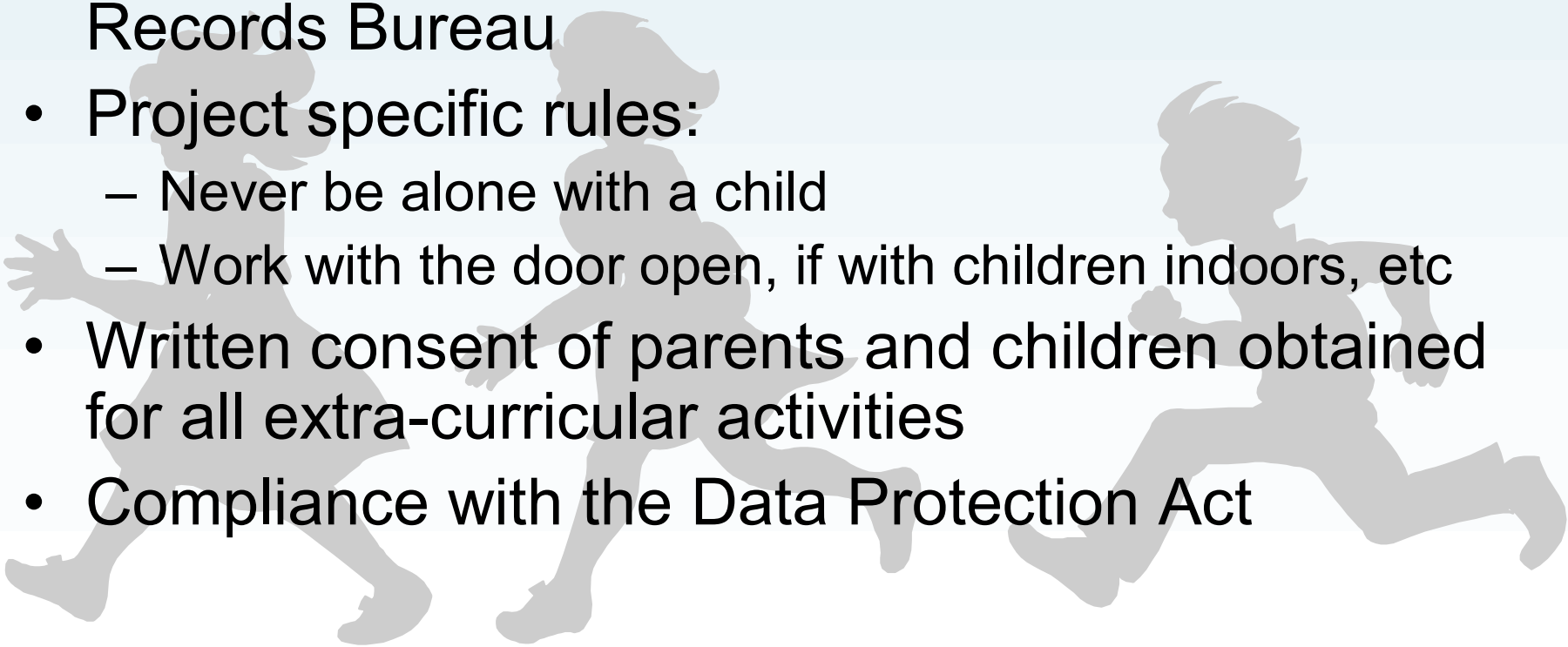
The research tools

- Monitoring children's travel and activity patterns:
  - Motion sensors (RT3s)
  - Diaries
  - GPS monitors
- Body composition measurement
- Questionnaires surveys of children and their parents, carried out through schools
- Interviews with parents and with children, including mapping exercises
- Children's drawing and mapping exercises
- Cameras
- Spatial reasoning tests

Ethical issues

For the work at UCL:

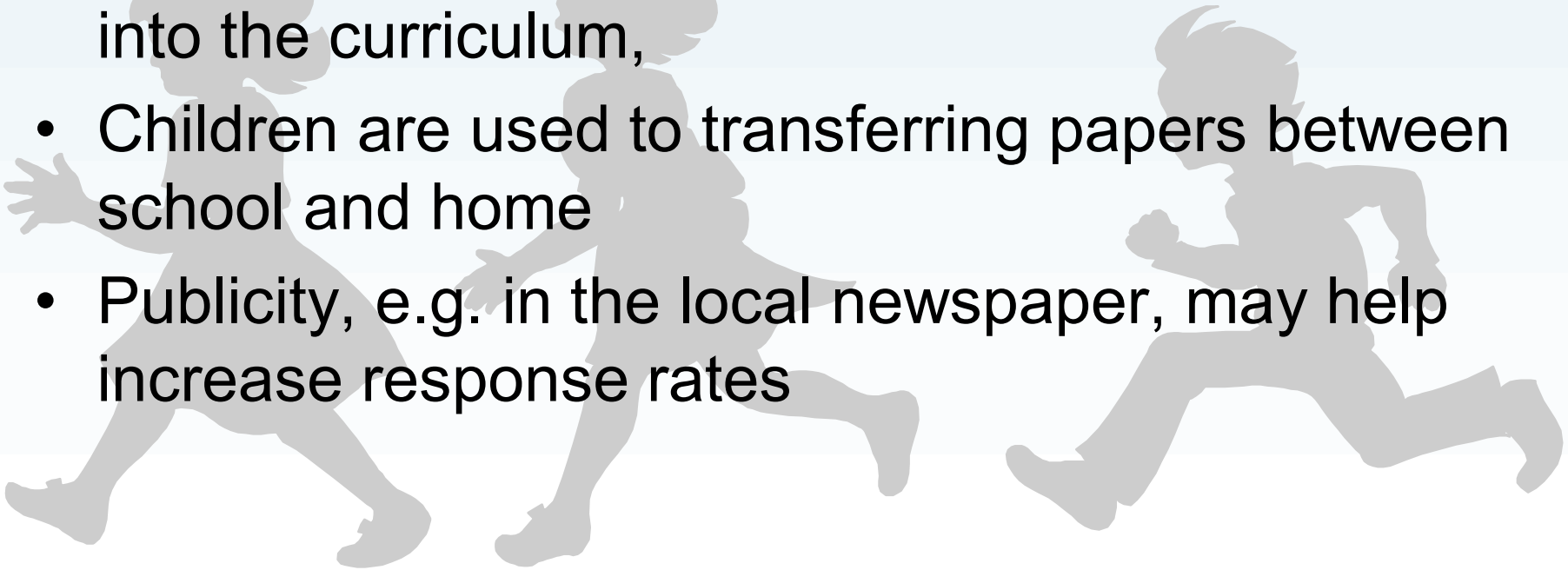
- Approval by UCL Research Ethics Committee
- Clearance of field researchers by the Criminal Records Bureau
- Project specific rules:
  - Never be alone with a child
  - Work with the door open, if with children indoors, etc
- Written consent of parents and children obtained for all extra-curricular activities
- Compliance with the Data Protection Act



Working with children

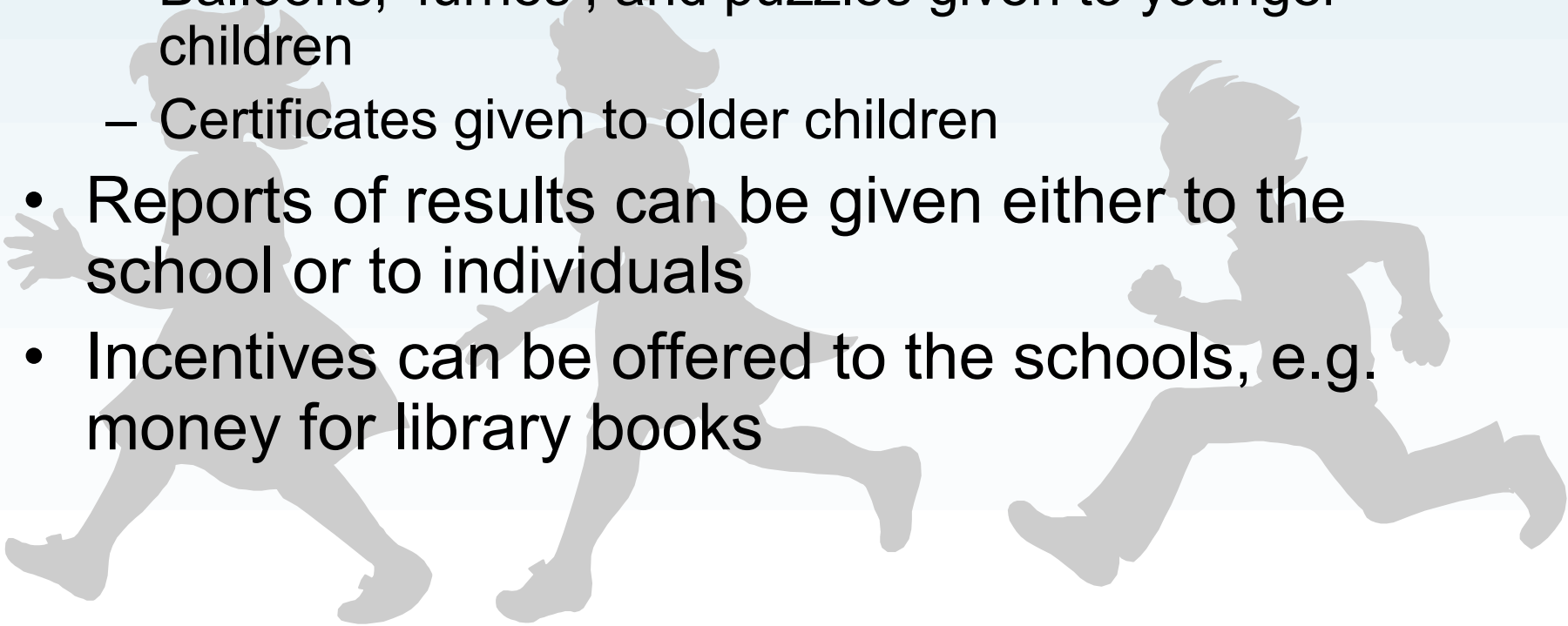
UCL projects carried out through schools:

- Initial contact through headteacher
- Primary schools (up to 11) - straightforward
- Secondary schools (11+) - needs to be integrated into the curriculum,
- Children are used to transferring papers between school and home
- Publicity, e.g. in the local newspaper, may help increase response rates



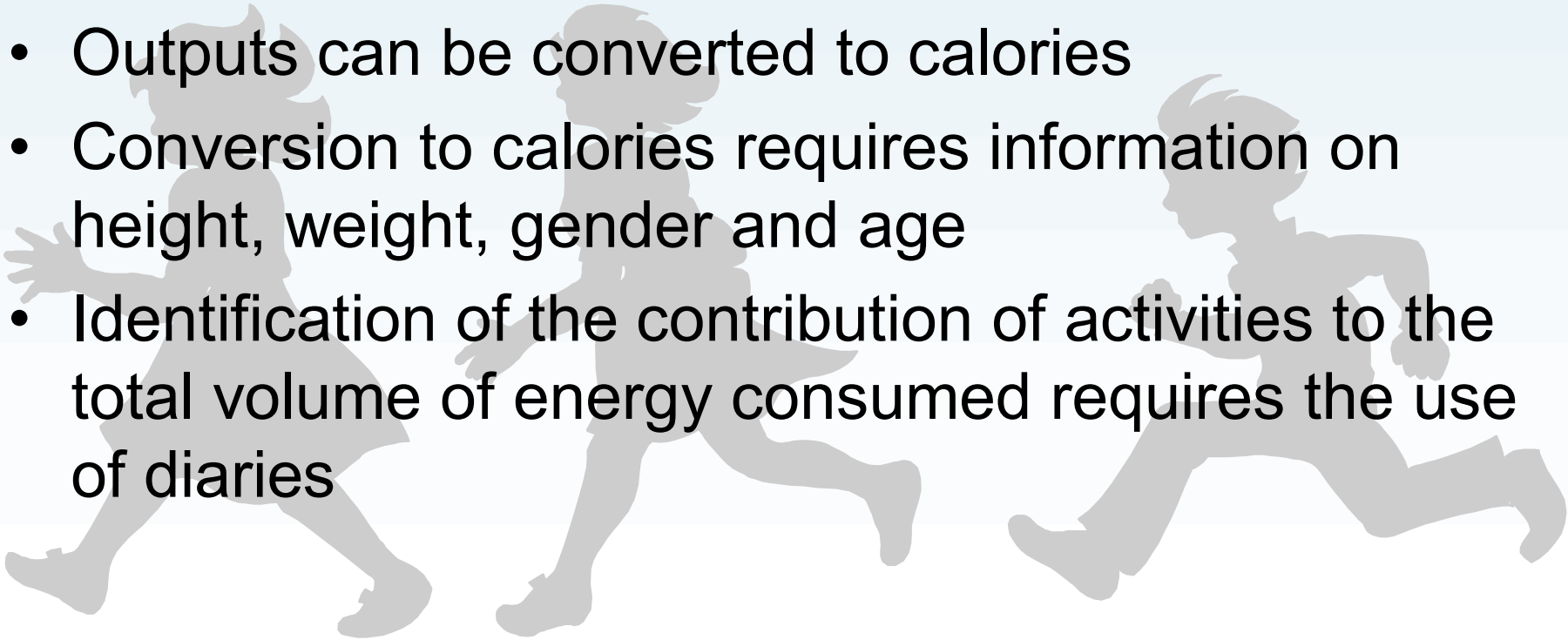
Incentives

- Giving incentives may help increase response rates, but the evidence is not clear
- Incentives for children do not need to cost much:
  - Balloons, ‘furries’, and puzzles given to younger children
  - Certificates given to older children
- Reports of results can be given either to the school or to individuals
- Incentives can be offered to the schools, e.g. money for library books



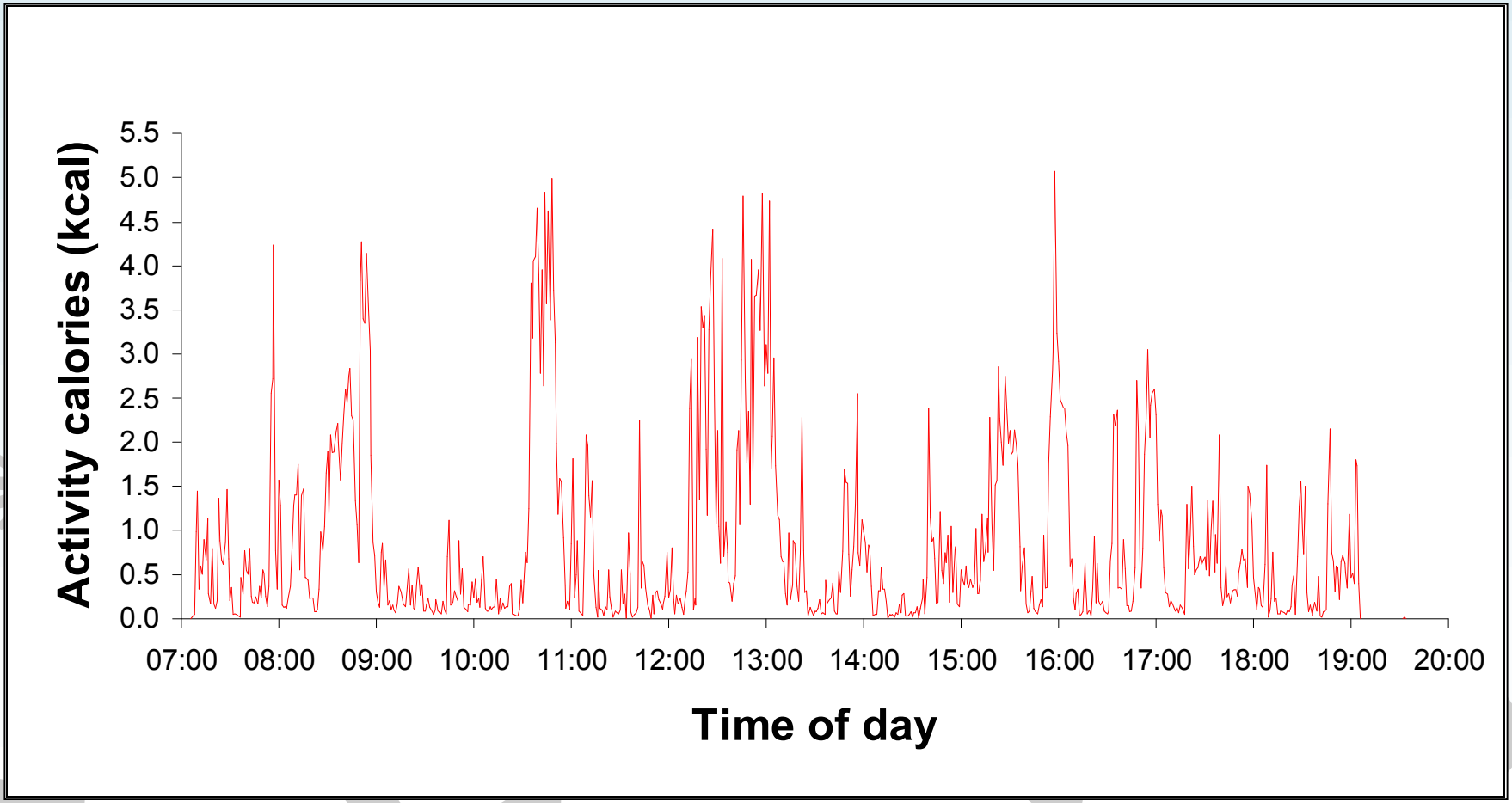
Physical activity monitors

- Portable electronic measuring devices
- Sophisticated versions of pedometers
- Used to measure energy consumption over time
- Outputs can be converted to calories
- Conversion to calories requires information on height, weight, gender and age
- Identification of the contribution of activities to the total volume of energy consumed requires the use of diaries



The RT3 motion sensor

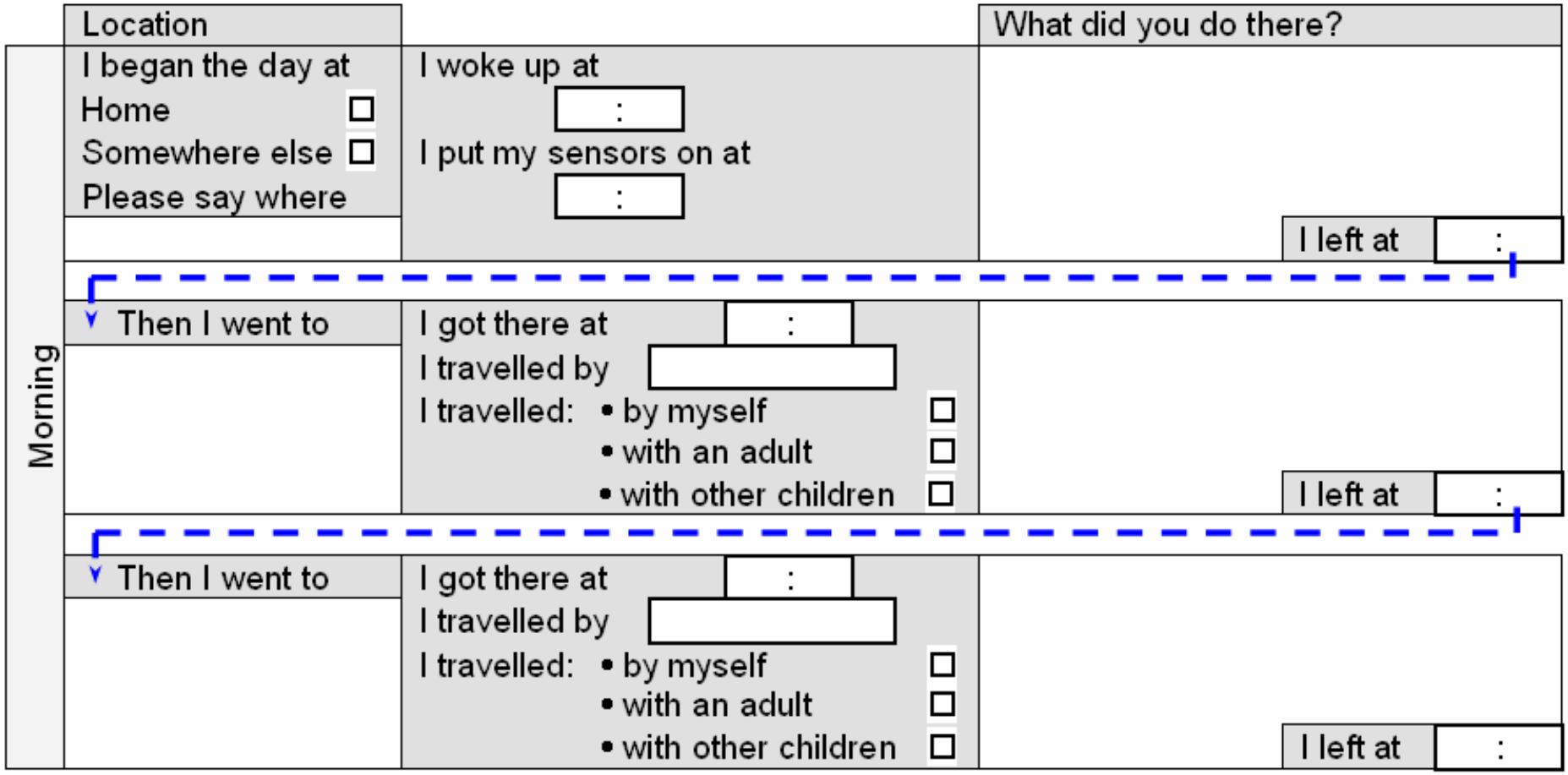
An example output from an RT3



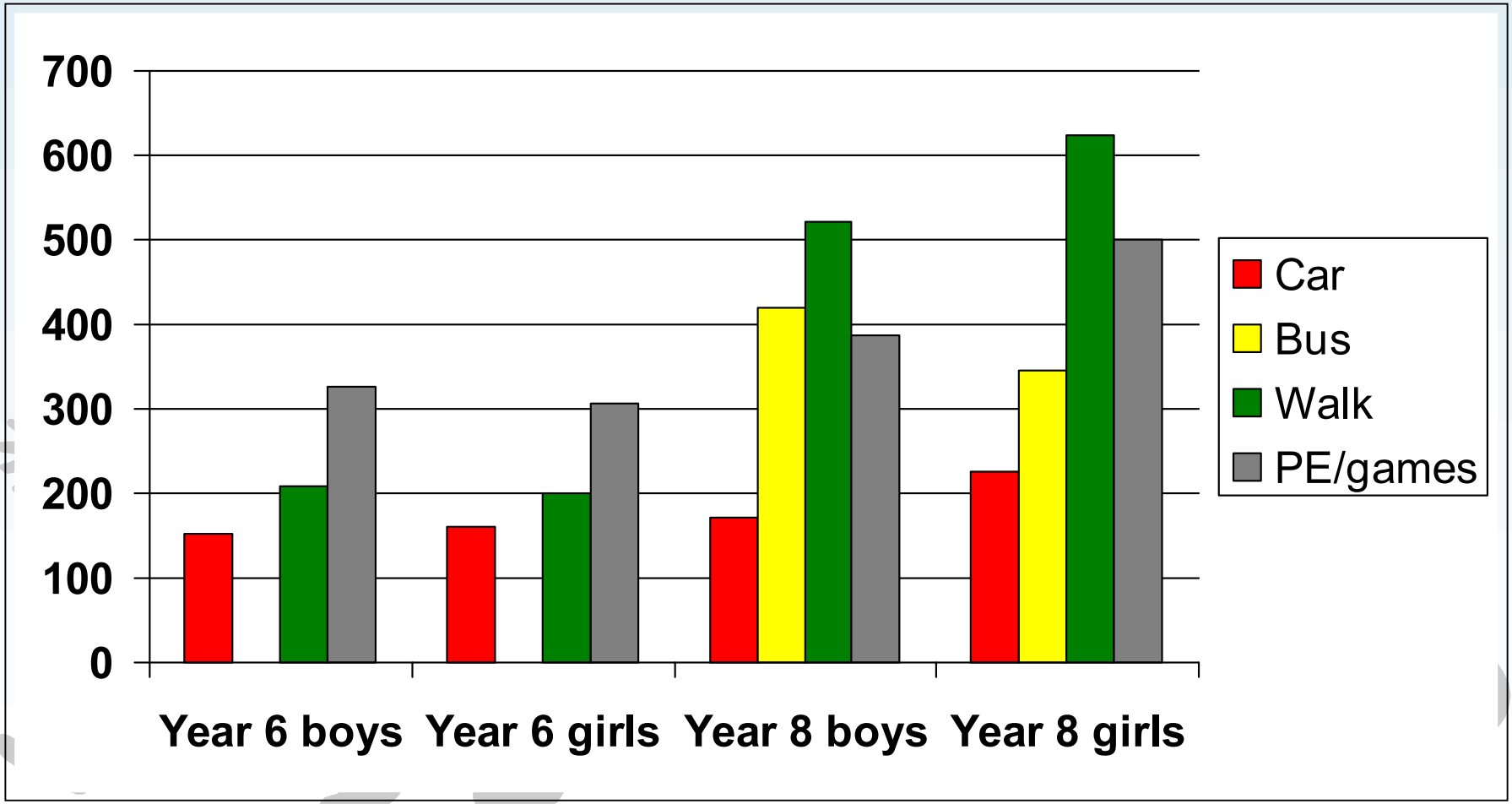
Diaries

- Used extensively in transport studies to record when, where and why trips are made
- Useful to record how often and how far children walk and cycle
- Not usually used with activity monitors, but have been in the UCL work
- Provide useful information on children's time use, activity patterns over the day, whom they are with, etc
- Require quite a lot of effort by the participants

A child's travel and activity diagram

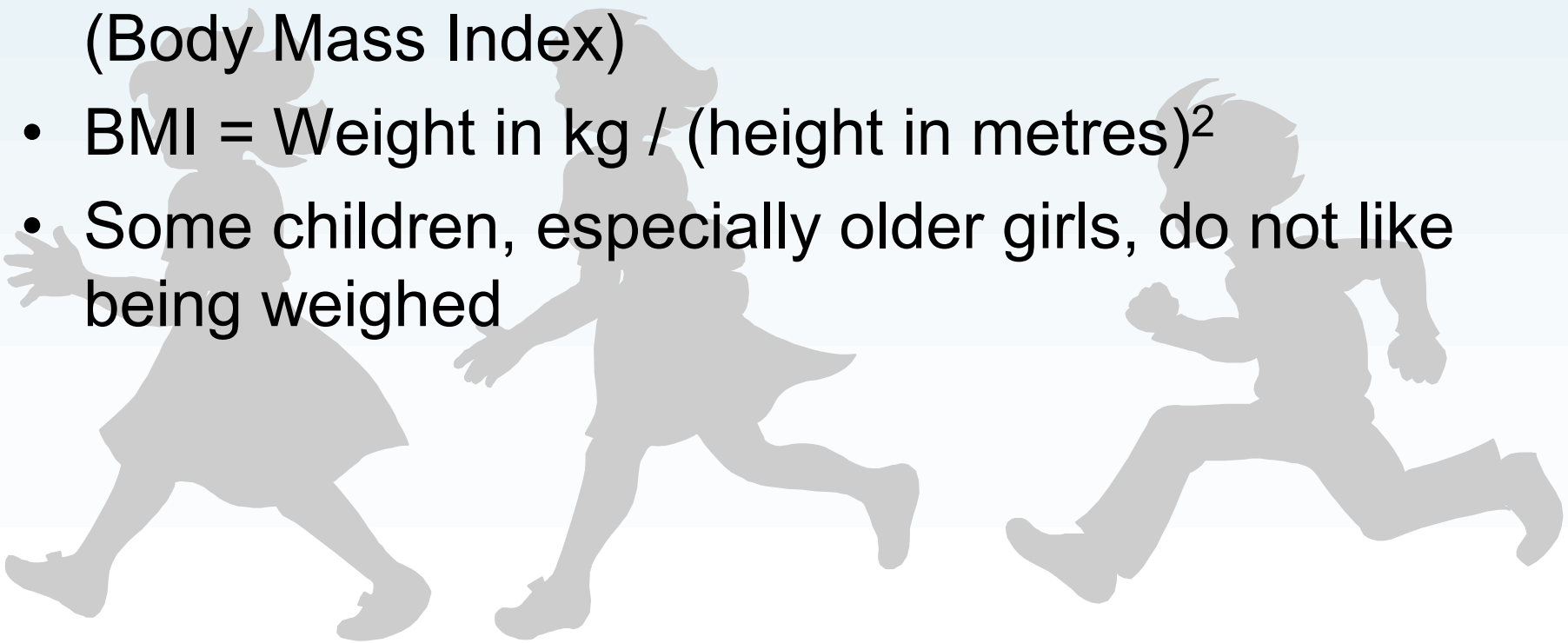


Energy used in a week in school travel compared with PE/games



Body composition

- Height, weight and body fat can be measured
- Body fat can be measured using an electronic body fat monitor or callipers, or by calculating BMI (Body Mass Index)
- BMI = Weight in kg / (height in metres)^2
- Some children, especially older girls, do not like being weighed



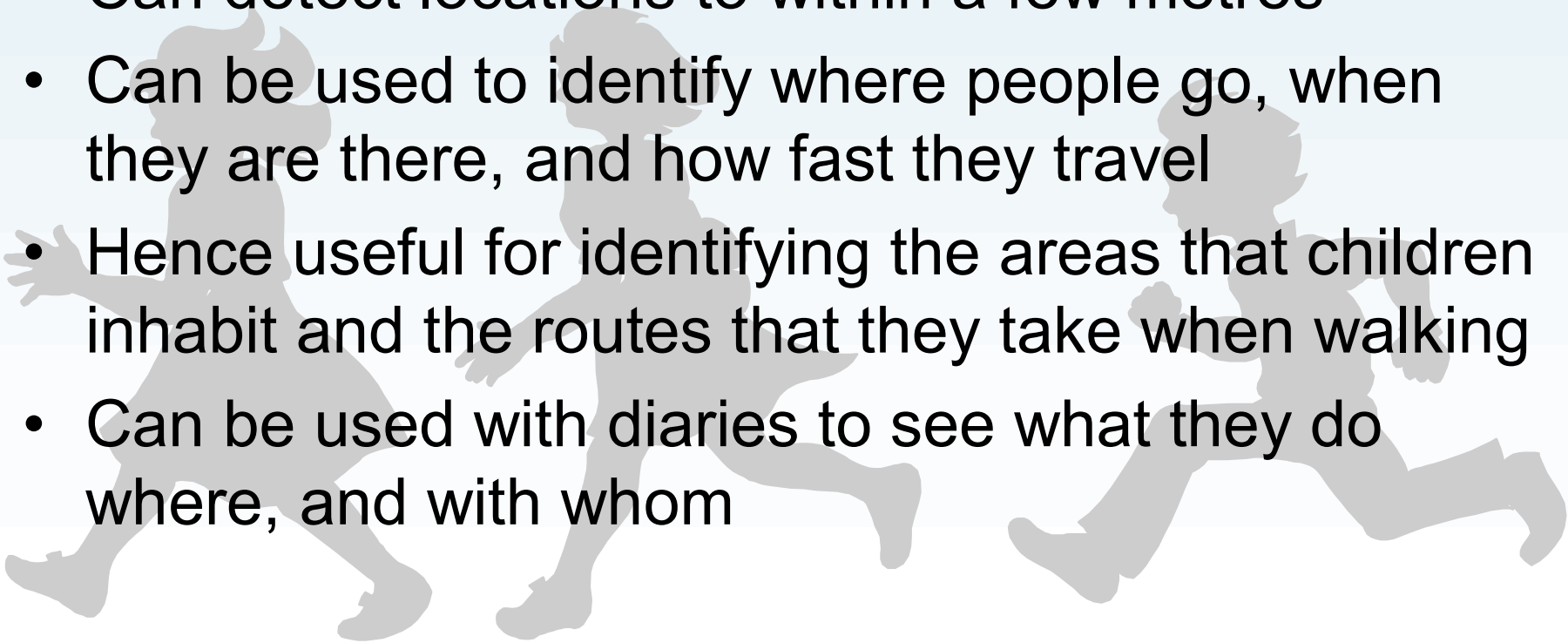
Using the Tanita electronic body fat monitor

The Tanita electronic body fat monitor

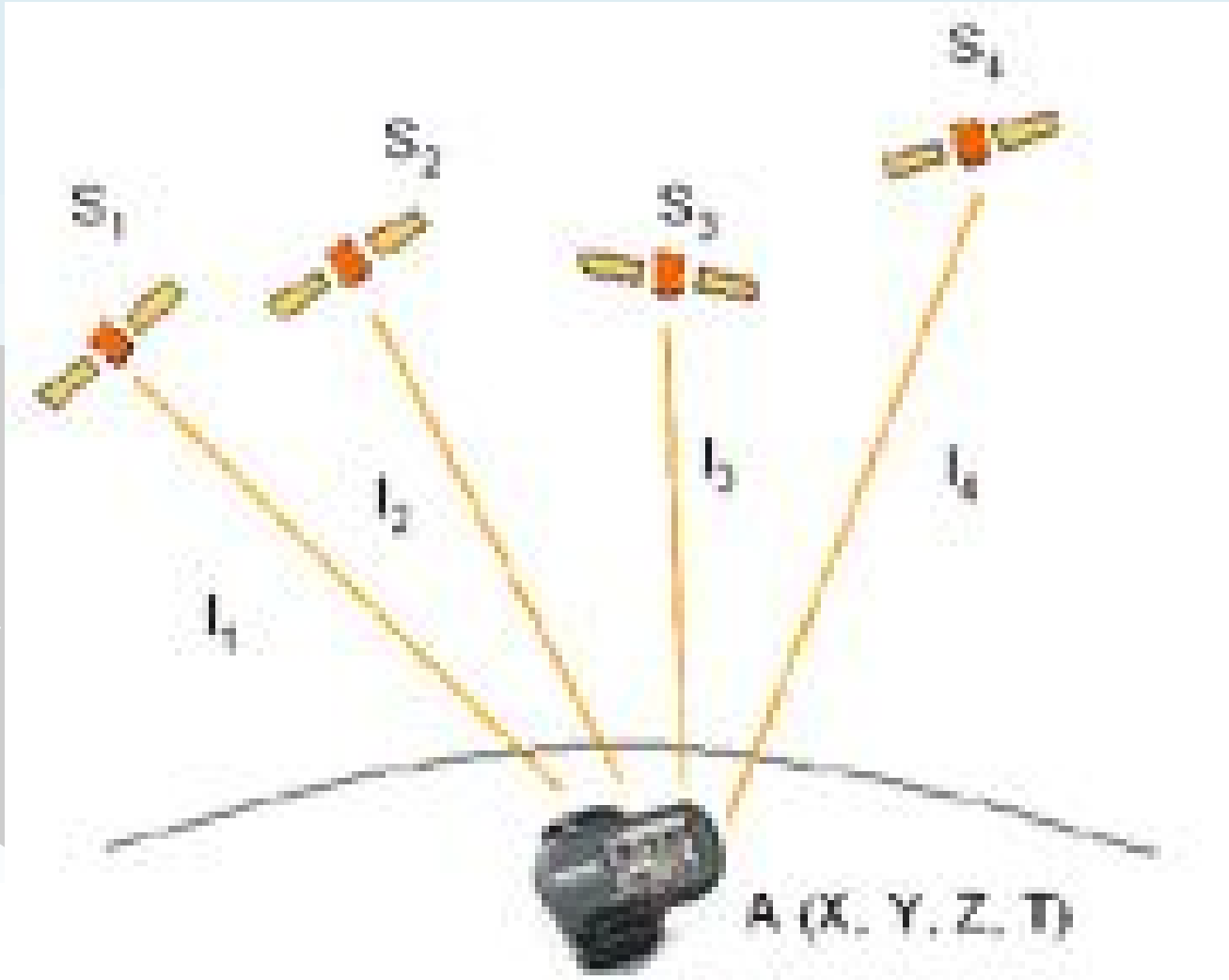
Measuring heights

GPS (Global Positioning Satellite) monitors

- A satellite-based positioning system
- Can detect locations to within a few metres
- Can be used to identify where people go, when they are there, and how fast they travel
- Hence useful for identifying the areas that children inhabit and the routes that they take when walking
- Can be used with diaries to see what they do where, and with whom



The GPS equipment



Wearing the GPS equipment

The Garmin Rangers

GPS plots of a boy aged 10 walking to school

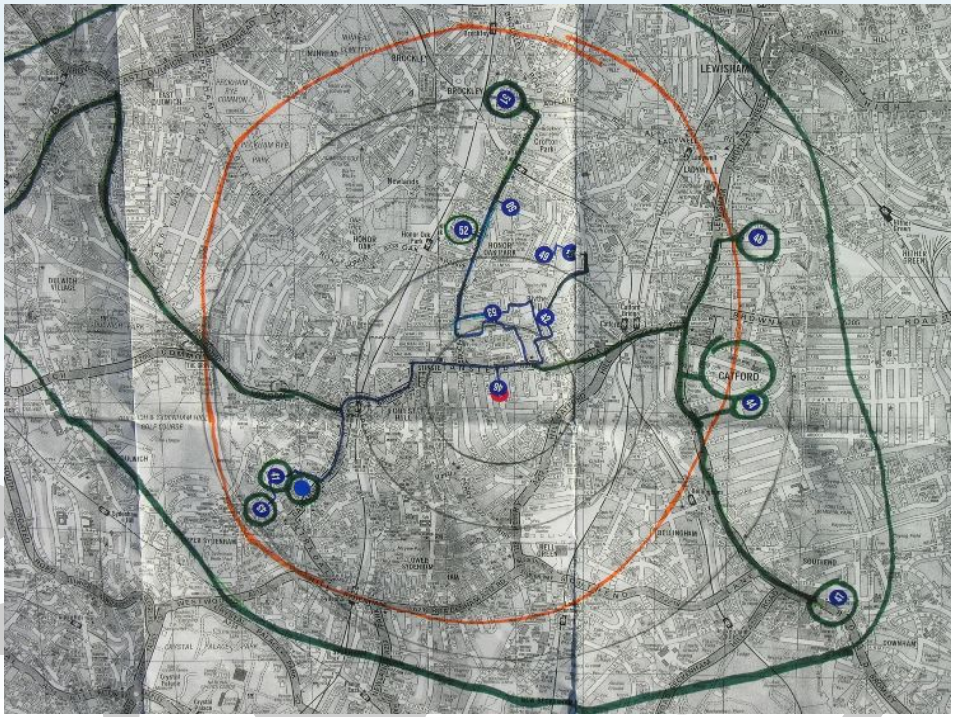
School journeys on foot from home to school

Linking the GPS and activity data

Map annotation exercises

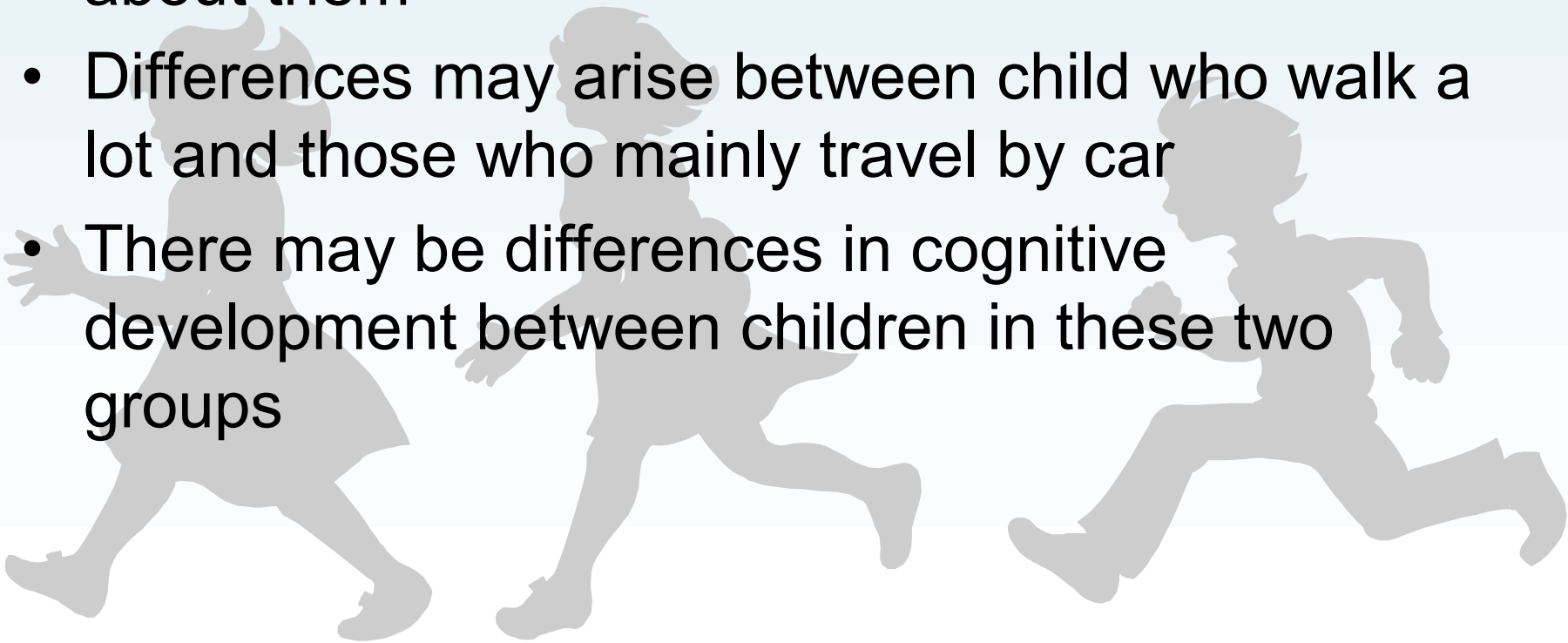
- Children are asked to mark on maps places of significance to them
- These can be interpreted directly or used in an interview

Map annotation exercise



Map drawing

- Used to obtain information from children about their perceptions and interpretation of the world about them
- Differences may arise between child who walk a lot and those who mainly travel by car
- There may be differences in cognitive development between children in these two groups



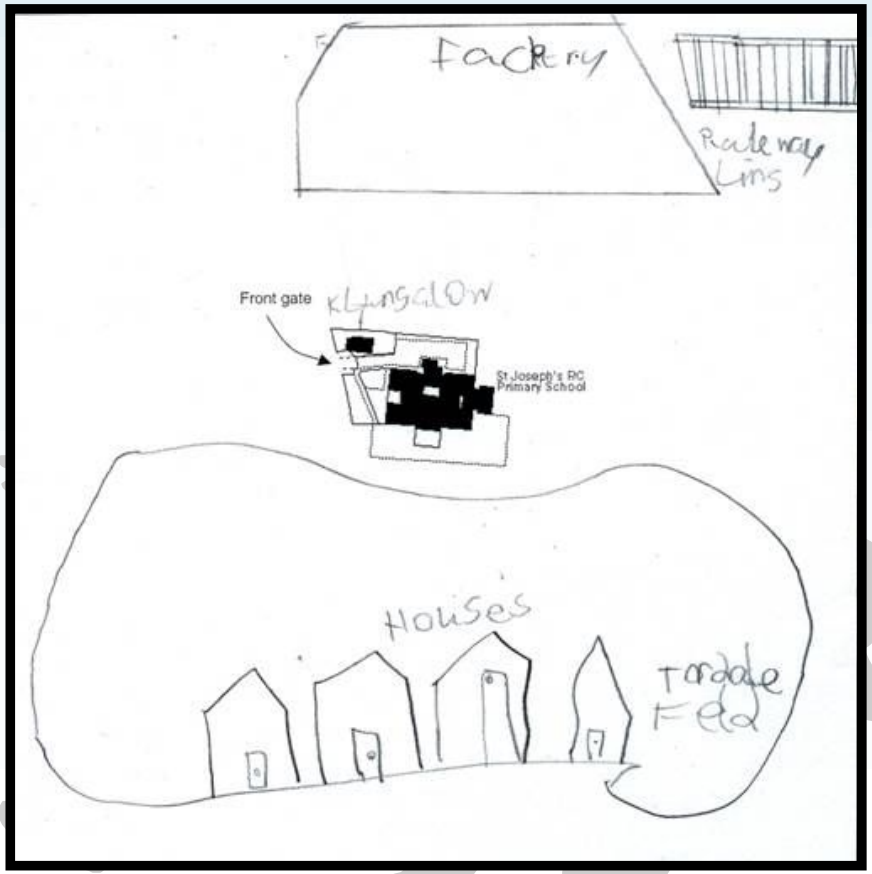
Analysis of children's maps

Area maps

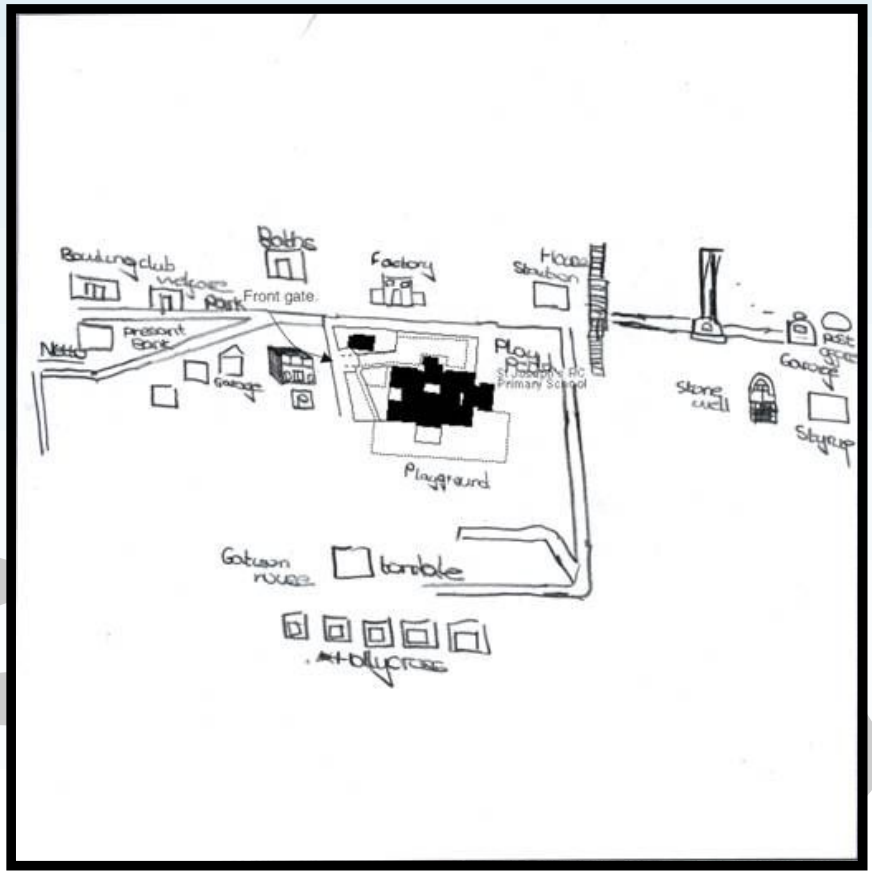
Route maps

Comparison of mapping of landmarks

Low element example

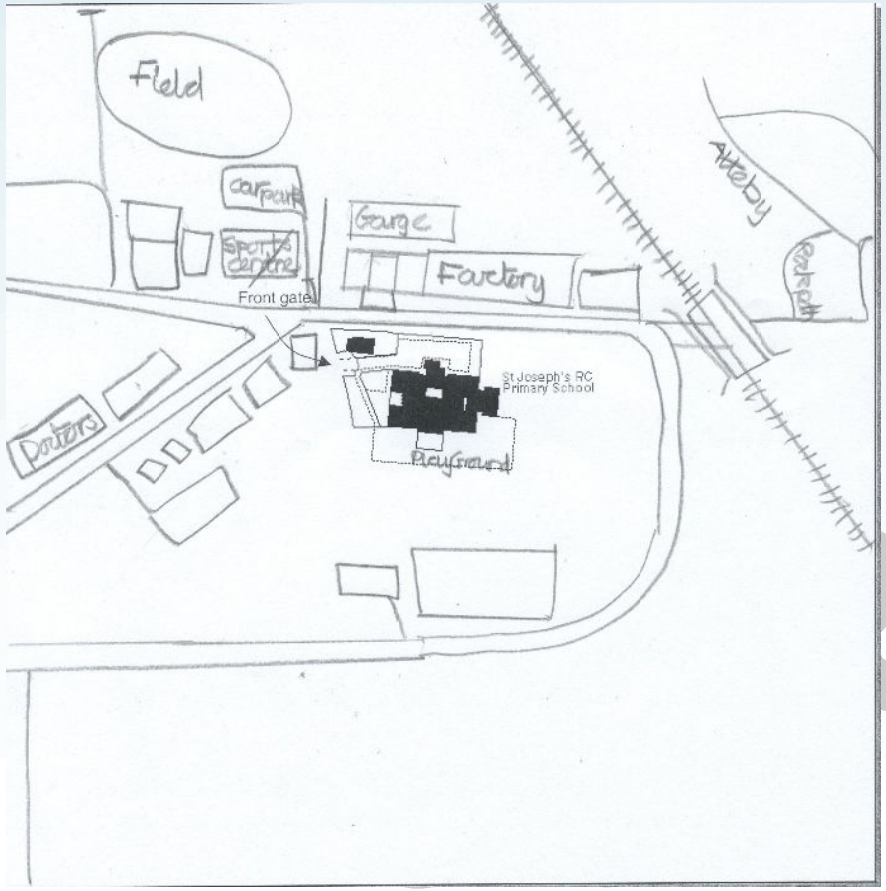


High element example

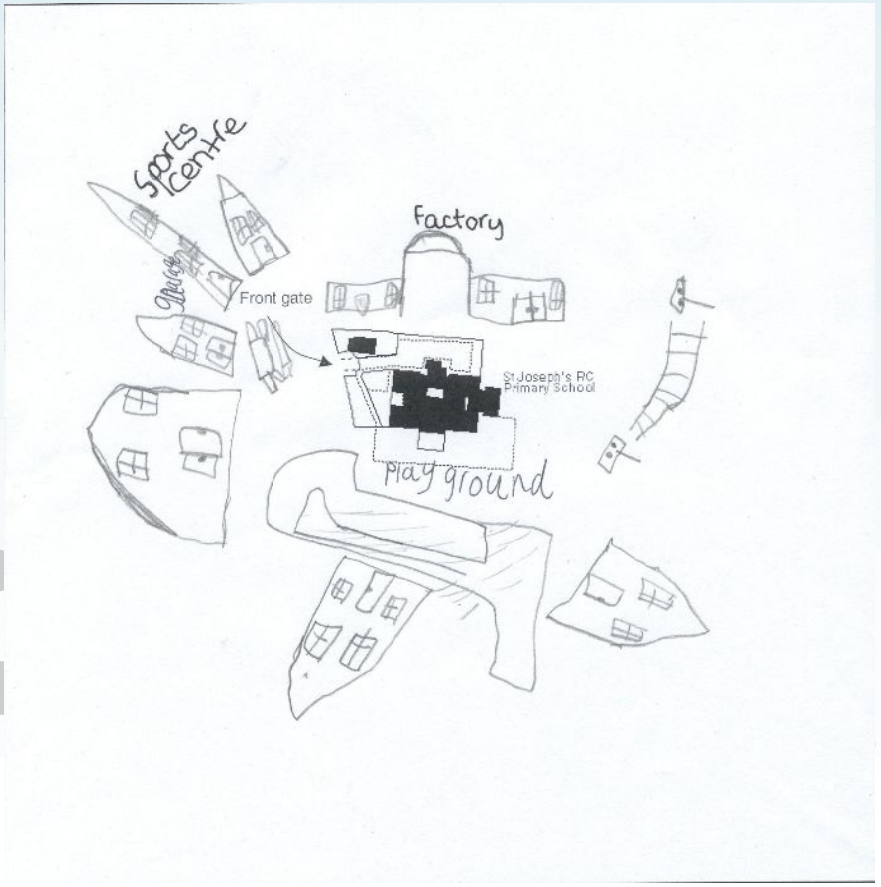


Area maps for children who travel to school by different modes

Walks to school

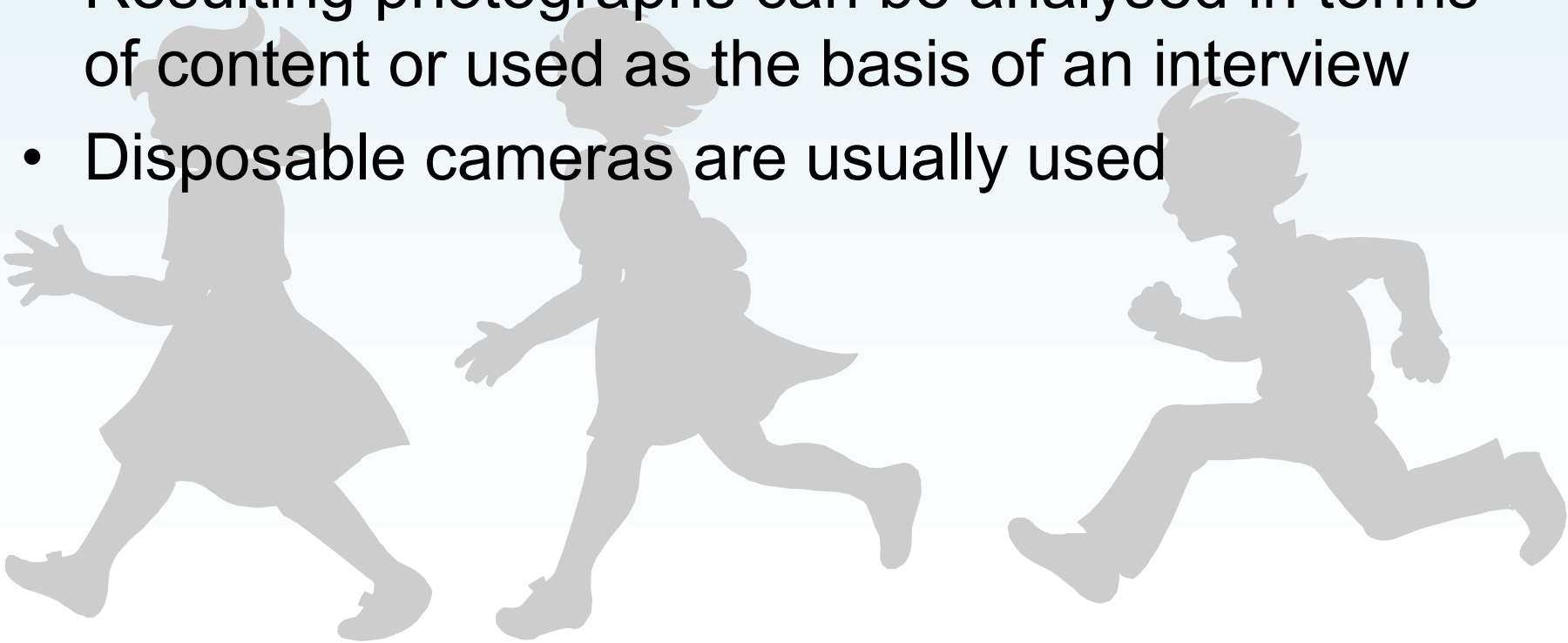


Driven to school

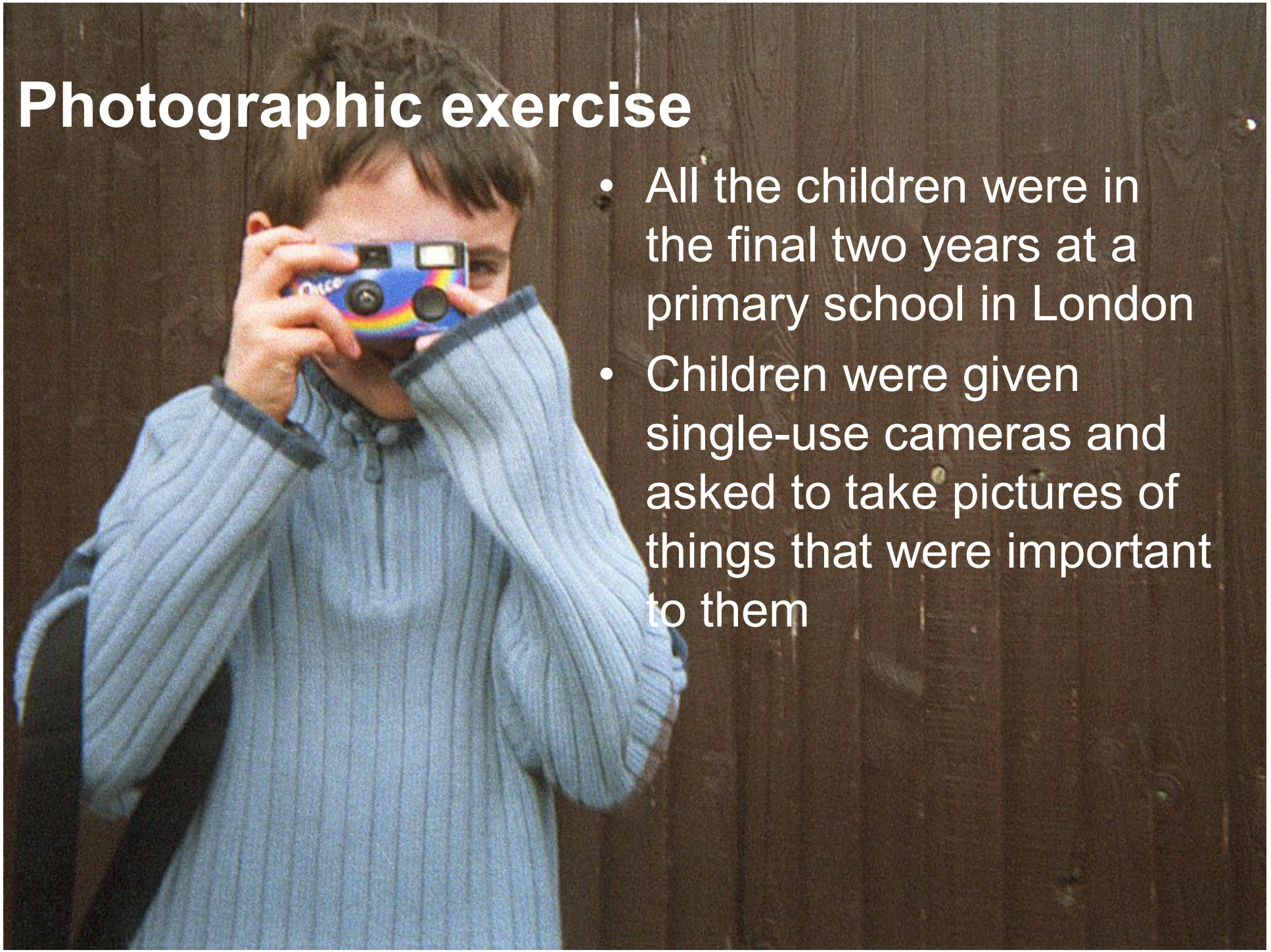


Using cameras

- Can be used by participants to record the places they visit
- Resulting photographs can be analysed in terms of content or used as the basis of an interview
- Disposable cameras are usually used



Photographic exercise



- All the children were in the final two years at a primary school in London
- Children were given single-use cameras and asked to take pictures of things that were important to them

Interaction with the environment

The photographs from the two girls appear to show differences in the way they experience their local environments

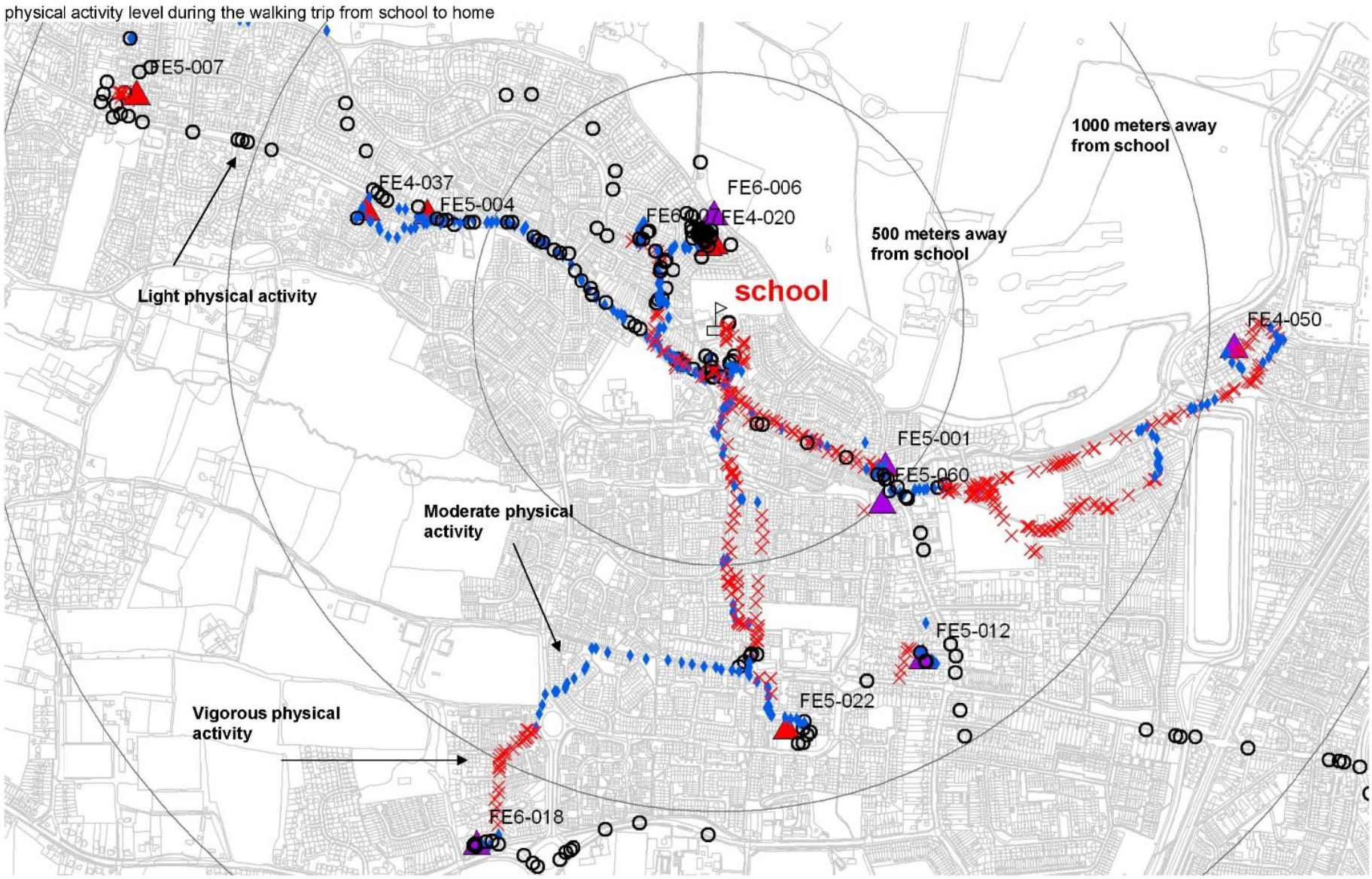
JP

RJ

Putting it all together

- Combining the techniques can be very powerful in showing how children interact with the environment

Physical activity levels walking home from school



The location of unstructured activities