

# Observational Methods in Inquiry: Observing Pedestrian Behaviour at Road Crossings

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## Abstract

People's behaviour and actions are central to almost every people oriented enquiry. An obvious technique is to observe and record their behaviour to describe, analyze and interpret to aid research findings. Pedestrian behaviour observation was carried out at 48 pedestrian crossing sites in England and Scotland as part of I'DGO TOO (Inclusive Design for Getting Outdoors), a collaborative research project funded by the EPSRC (Engineering and Physical Sciences Research Council), UK. Both structured and participatory observation techniques were used to understand how old pedestrians and pedestrians with disabilities approach a road crossing and navigate through the crossing; their attitudes towards the inclusive features of pedestrian crossings were also recorded. After establishing theoretical background of observational methods in inquiry an observation protocol was developed for I'DGO TOO and observations were carried out. This paper briefly presents theoretical background of observational methods in inquiry and observation protocol adapted in the research. It also presents an example of carried out observation and discusses behaviour observed during that observation.

**Keywords:** EPSRC, inclusive design, pedestrian behaviour observation, I'DGO TOO (inclusive design for getting outdoors), pedestrian crossing

# 1. Introduction

I'DGO TOO (Inclusive Design for Getting Outdoors) is a collaborative research project funded by the EPSRC (Engineering and Physical Sciences Research Council), UK. Overall aim of the I'DGO Consortium is to address the demands, consequences and impacts of new policies and design strategies on older people's environment and make specific recommendations to make them inclusive. This would help to improve quality of life of older people in such a way that it will become general practice in the years to come (I'DGO, 2010). SURFACE Inclusive Design Research Centre of the University of Salford is currently investigating the use of tactile paving at road crossings and external steps as an indicator of access hazards for vision impaired pedestrians. The research methodology adapted for the project calls for full characterization of the pedestrian environment and access hazards; also any other contextual issues that affect performance of pedestrians (Faruk et. al, 2008a; 2008b). The methodology also requires to ascertain how pedestrians with disabilities and older pedestrians approach and navigate through the built environment; i.e. pedestrian crossings within the scope of this paper.

Between January and December 2009 road crossing behaviour of pedestrians with disabilities and older pedestrians were observed at 48 I'DGO TOO pedestrian crossing sites in England and Scotland. Both structured and participatory observation techniques were used to observe and record pedestrian behaviour as they approached the pedestrian crossings and crossed the roads. Through observations and semi structured interviews, pedestrian attitude towards the inclusive features of pedestrian crossings were also recorded. This paper briefly presents theoretical background of observational methods in inquiry and observation protocol adapted in the research. It also presents an example of carried out observation and discusses behaviour observed during that observation.

## 2. Observational methods in research

People's behaviour and actions are central to any people oriented enquiry. An obvious technique is to observe and record subject's behaviour to understand, analyse and interpret to aid research findings. Advantage of using observation as a technique is within its directness. It can often be used as a supportive or supplementary technique to compliment information obtained by virtually any other technique; i.e. Interview or questionnaire responses (Robson, 2002).

### 2.1 Types of observational methods

There are different approaches to observational methods in enquiry that a research can undertake. Robson (2002) and Gray (2005) has identified 'Participant Observation' and 'Structured Observation' being the two most used observational techniques in qualitative and quantitative research respectively. According to Gray (2005), Saunders et al. (2000) found that participant observation emphasizes the meanings that people give to their actions; whereas structured observation focuses on the frequency of their actions. Structured observation attends only the pre-specified relevant aspects for the study. It is easier to achieve high reliability and validity with this

approach. Informal approaches are less structured in nature and the observer collects information in a method that suits him or her. It can vary from note taking to diary keeping, simplified drawings, photo taking, and also gathering information from informants. This type of information is relatively unstructured and complex, and requires the observer to perform difficult tasks of synthesis, abstraction and organisation of data (Robson, 2002). Robson also suggests a ‘pick & mix’ approach – a ‘hybrid’ which is both structured and participatory in nature to suit the needs and possibilities of a research.

## 2.2 Data gathering and recording

Burgess (1984, as mentioned in Gray 2005) provided a list of potential data sources during observation based on a research. For any observational data gathering he suggested to identify the Space; Actors; Activities; Objects; Acts; Events; Time; Goals; and Feelings. Bailey (1996, as mentioned in Gray, 2005) suggests that it is not only about how to conduct an observation but what to observe. He suggested the following things to start the observation with when entering an observation field. They are Lighting; Colour; Smell; Sound; Objects; Weather and Temperature. He also emphasized on taking field notes as they are *‘the backbone of collecting and analyzing field data.’* Field notes develop out of an analytic process. First the researcher must attempt to take a mental note which can be recalled later to aid the production of written notes. Written notes comprise of observations in the field to produce more comprehensive field notes, of which there are several components (Figure 1) (Ellen, 1984 as mentioned in Gray, 2005). Gray (2005) said, *“It is impossible to observe everything that takes place in a situation, so it helps if the researcher is able to partition activities to focus on key areas”*. Berg (1995, as mentioned in Gray, 2005) suggests strategies for observational data gathering, they are,

- *“Take in the physical setting by visiting the environment that people will be observed in.*
- *Develop relationship with inhabitants*
- *Track, observe, eavesdrop and ask questions.*
- *Locate sub-groups and ‘Stars’.”*

A researcher can collect data or information ‘Covertly’ or ‘Overtly’ under the observation types mentioned above (Figure. 2). During overt observation, those being observed are aware of the observation taking place. On the contrary, covert observation is where the subjects are unaware of this. Although some consider covert observation unethical; researchers in favour of it argue that people may change their behaviour during overt observation, thus affecting validity of the results (Gray, 2005).

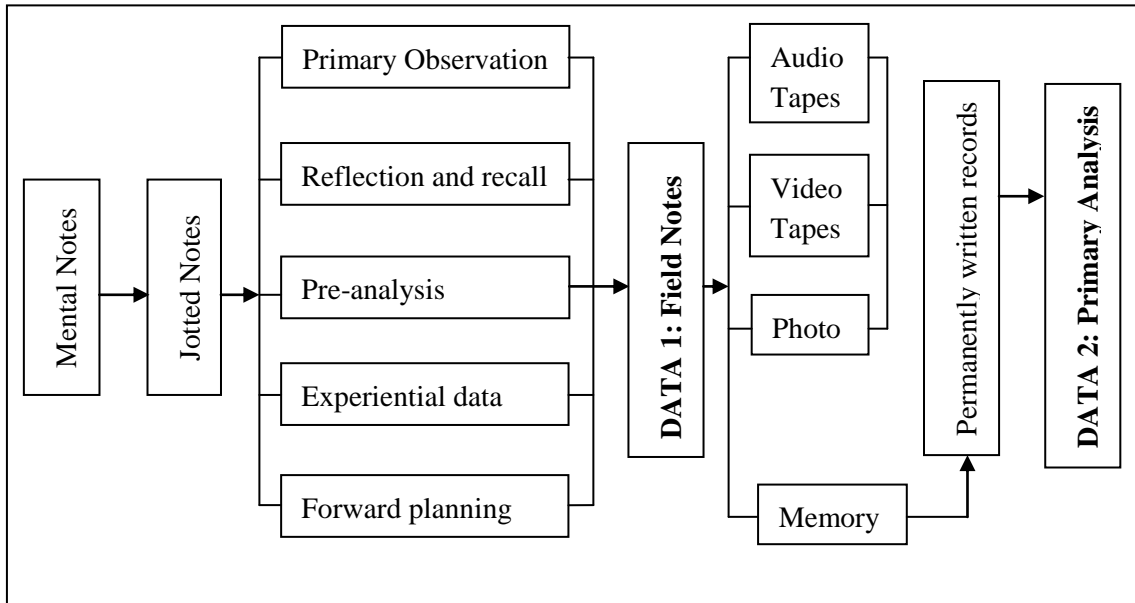


Figure 1: The data gathering process (Ellen 1984, as mentioned in Gray, 2005)

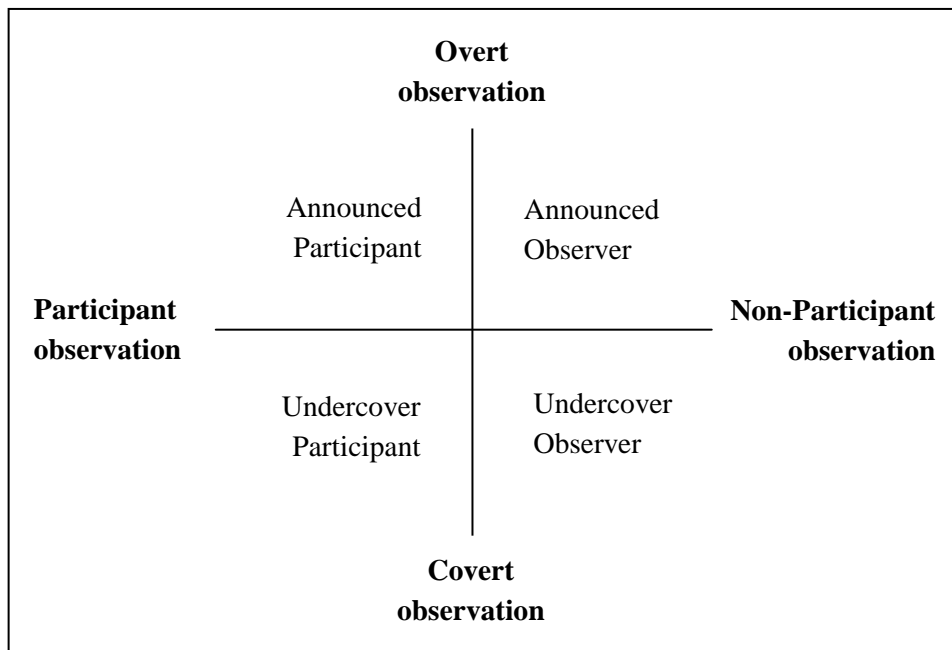


Figure 2: Observation research roles (Gray, 2005)

## **2.3 Reliability of observations**

The same event can be observed, recorded and interpreted by different researchers differently. One way of reducing the unreliability in observation and data collection is to record the event in a way so that the data can be reviewed and re-interpreted when required. It can be achieved by recording of data through exact notation system as it can reduce human error in the recall of events. Experienced researchers rely heavily on comprehensive notes. Because, details that appeared hardly relevant at the time of the observation may prove to be crucial. Triangulation is another way of improving reliability of a study. Triangulation can reduce sources of error by gathering data from multiple sources, or using variety of methods or theoretical approaches (Gray, 2005).

## **3. I'DGO TOO observation**

After establishing theoretical background of observational methods in inquiry the I'DGO TOO observation study has been designed. Aim of this part of the study was to collect mainly qualitative and some quantitative data that would triangulate with findings from the Tactile Paving Toolkit (Audit of the pedestrian crossings) and Questionnaire Survey results. A series of pilot observations were conducted in Salford to fine tune and finalise the observation protocol. A session of observation was one hour long. The observers then had a rest period, or could undertake some other activity to prevent observation fatigue. The observers had 3 copies of simplified sketch / plan of the overall layout of road crossing and immediate environment. They were equipped with a stopwatch, note paper, a camera and all weather clothes. Because of health and safety reasons observers had to wear high visibility jackets and identification badges.

### **3.1 Observation protocol**

The following observation protocol was followed during all the observations with some exceptions at the observers' discretion depending on each individual case.

- Observer to position themselves so that they can observe people coming towards them from the opposite side of the road who are likely to cross near to the crossing, without blocking the crossing point. Where possible 2 observers will be stationed on opposite sides of the road and observe simultaneously pedestrians on both sides. If there is only one observer then after 20 minutes the observer will change to the other side of the road.
- Using one copy of the sketch/plan spend 20 minutes marking up the routes taken by people crossing the road in that vicinity. Indicate initial person by an arrow showing the route, and then add a tally mark if another person uses the same route. If the person is an older person make a note such that the tallies of older people to younger people can be counted at the end (add an o to the tail of the I tally mark). Note the date, start and end times of the observation period, along with weather conditions and any other pertinent factors, such as traffic levels, temporary works, etc.

- On the second sketch/plan spend 20 minutes making a note of whether people stand on the tactile paving, or if not where are they standing. If they are an older person make a different mark to highlight them. Make a note if the reason people are off the tactile paving is due to the volume of people at the crossing point.
- For each crossing take the particular features identified from the summary TPT sheet and observe the effect that has on the way people use the crossing. Also include in this anything that another researcher has noticed when handing out questionnaires on a previous date; such as sunlight making it hard to see the signals to cross. This may be incorporated into the first 20 minute period.
- Capture the walking speeds of older people crossing on the crossing point using the stopwatch. This will be used to compare to the average time from the TPT and allowance given by Highways on controlled crossings.
- If any visually impaired people, blind people, wheelchair users, mobility impaired people, crutch users cross the crossing attempt to interview the person by asking what they think about that particular crossing point. Use the note paper to record their views and the time/day of the observation. The third blank sketch/plan can be used to note features they comment on, or to help explain the layout.

### **3.2 Example of I'DGO TOO observation at Cheam, Surrey**

Pedestrian behaviour observation was carried out at I'DGO TOO Site (Site Reference Number: SC2) on Cheam Broadway at Sutton, Surrey. The observation was carried out in accordance with the established protocol (as mentioned earlier) to gather observational data that would triangulate with findings from the Tactile Paving Toolkit (Audit of the pedestrian crossing) and Questionnaire Survey results conducted earlier. The observation was carried out on a sunny Sunday afternoon of 5<sup>th</sup> of April, 2009. A weekend afternoon was selected as more pedestrians representing various age groups and also pedestrians with disability access the village centre on foot (Close to the pedestrian crossing) on weekends compared to weekdays.

Two observers went to the site with pre-prepared simplified site drawings in accordance with the written protocol. Specific date, time and weather condition during the observation was recorded. Total number and differences in types of pedestrians, cyclists were recorded in the observation sheet. The routes that the pedestrians followed to cross the road were marked with starting point showing the direction that they went. The location each pedestrian stood on while waiting to cross was also marked. Any unusual behaviour; i.e. crossing the road at red light; any slip or trip; eye contact with the drivers before stepping on the road, etc were also recorded. Walking speeds of pedestrians were also recorded on the field note. The observation sheets and the field note for the pedestrian crossing at Cheam are shown in Figure 3.

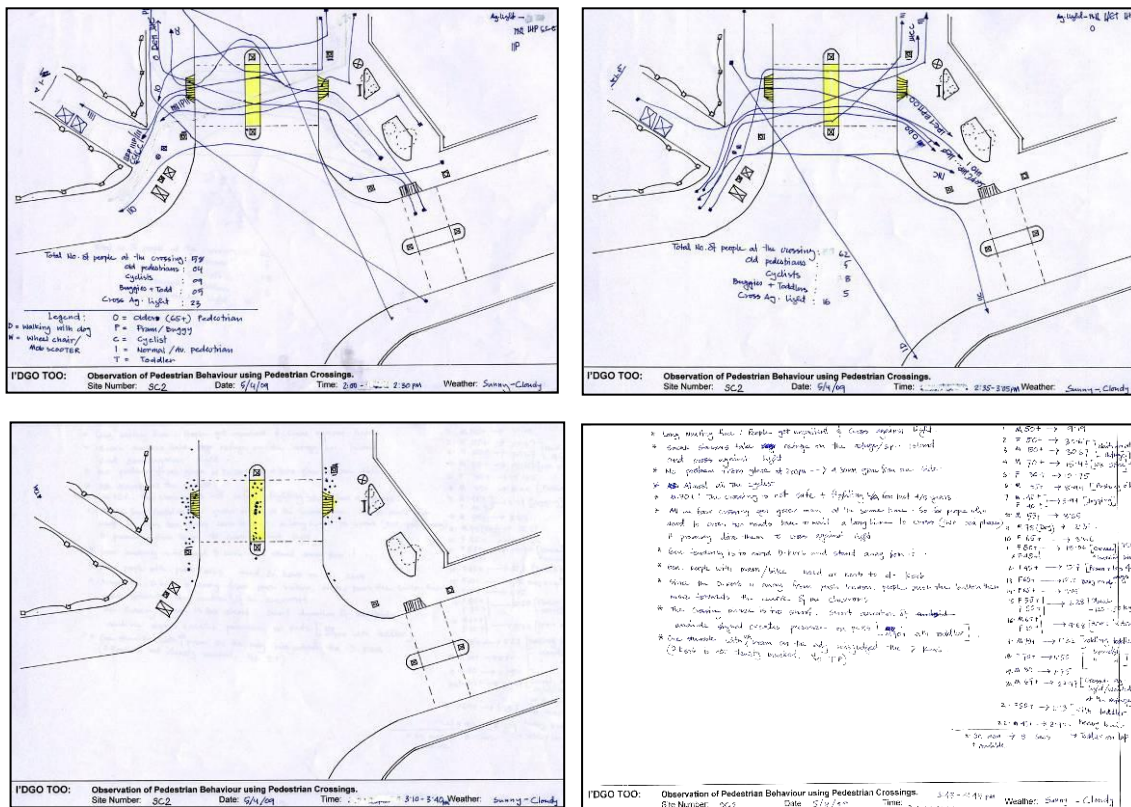


Figure 3: Observation sheet and field notes of I'DGO TOO pedestrian crossing site at Cheam

During the observation, very short but semi structured interviews were also conducted (Figure 4). Older pedestrians and pedestrians with disabilities were identified and were requested to express their views and concerns on different aspects of that particular pedestrian crossing. Local knowledge of the pedestrians picked up during these interviews is invaluable.

### 3.3 Summary of observation at Cheam, Surrey

- SC2 is a signalised crossing at a four way junction. There is no guard rail at this crossing. The crossing has a long waiting time. Pedestrian crossing phase gets activated at all the four crossings at the same time. Time given to cross one segment of the four way junction is about right for able bodied pedestrians; but not for those who walk slower than average.
- Pedestrians who want to cross two segments of the junction are unable to cross within one pedestrian phase. They either have to wait for second pedestrian phase or cross the road diagonally. Most pedestrians are unable to cross the junction diagonally within one pedestrian phase. To avoid long waiting time pedestrians often start early; seek gap between cars; cross against light.

- Pedestrians using the road crossing often start to cross the road against traffic light and use to refuge to cross during a suitable gap.



Figure 4: Semi structured interview with older pedestrians during I'DGO TOO behaviour observation at Cheam

- Around 4:00 pm glare from the sunlight was making it difficult for pedestrians to see the traffic light properly from one side of the crossing.
- 50 percent of the kerb has been dropped on both the sides. There is no tactile paving or marking installed on the kerb. A female pedestrian (Age 45+ Years Approximately) was pushing a buggy and misjudged the dropped kerb section of the crossing and hit the kerb.
- The pedestrian push button station is almost 1.5m away from the dropped kerb section of the crossing. General tendency of the pedestrians were to stand away from the dropped kerb section of the crossing. Few pedestrians pushed the button then moved toward the centre of the chevrons but stayed away from the dropped kerb section.
- Bicyclists, pedestrians with buggies used the dropped kerb section of the crossing. Able bodied pedestrians did not care about the dropped kerb section.
- The audible signal is shorter than the actual crossing phase. A female pedestrian of 65 and a male pedestrian of 75 year thought that it added pressure on pedestrians to cross the road in a hurry that could cause slip or trip.
- Older pedestrians were very cautious to step on the road compared to younger pedestrians. A female pedestrian of 70 actually waived her hand towards the waiting driver to catch his attention before stepping on the road.



- This observation at SC2 found 120 pedestrians using this crossing in an hour. 9 of them were old pedestrians; 17 cyclists; 10 buggies and toddlers. 39 pedestrians crossed against the traffic light of which 2 were old pedestrians. 21 pedestrians crossed the road away from the crossing of which 1 was an old pedestrian. 14 pedestrians used half of the designated crossing then moved away from it walking the direction towards their destination. None of them was old pedestrian.
- Walking speed of pedestrians have been recorded with their approximate age, height, weight and other attributes (if any); i.e. any attribute that can affect walking speed of a pedestrian.

## 4. Conclusion

After establishing theoretical background of observational methods in inquiry an observation protocol was developed for I'DGO TOO and pedestrian behaviour observations were carried out at 48 I'DGO TOO pedestrian crossing sites. This paper has very briefly presented theoretical background of observational methods in inquiry and observation protocol adapted in the research. Aim of this part of the study was to collect mainly qualitative and some quantitative data that would triangulate with findings from the Tactile Paving Toolkit (Audit of the pedestrian crossings) and Questionnaire Survey results to inform the research. An example of pedestrian behaviour observation from I'DGO TOO have been presented within the scope of this paper to show how data collection (observation) was guided by the established observation protocol which was developed based on the theoretical background of observational method as a research tool. Data collected so far is currently being analysed and results will be published soon.

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