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A qualitative study exploring perceived environmental determinants of physical activity behaviour in children

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Abstract

In this article, we consider children's perceptions of their social and physical outdoor environment in relation to their physical activity (PA) behaviour in Scotland, United Kingdom. Drawing from a pilot study, participants included three groups of children aged between ten and twelve of mixed gender (n=15). Visual and verbal representations of their perceived environment were analysed to assess environmental determinants of PA. Results found an absence of suitable play affordances, safety, parental restriction, and environmental aesthetics was a key factor to children spending time outdoors. Strengths and limitations of the study are discussed, as are implications for policy and practice.

Introduction

Childhood inactivity is a global epidemic affecting children from numerous countries (Hallal et al., 2012). Those who reach the recommended PA levels are less likely to suffer from acute and chronic health problems.

Research has found that time spent outside is positively associated with increased PA levels in children (Cleland et al., 2009). Establishing an appealing environment in which children willing spend their time may help to increase children's PA levels. The current paper aims to explore types and features in the environment children like and dislike creating an outdoor environment that children actively spend their time.

Past literature has been largely concerned with objectivity (e.g. using accelerometry to measure PA). When exploring how children perceive their environment it is important to consider a more qualitative route.

Aims

The aims of this paper were to

- Investigate which physical environment features might facilitate or impede physical activity
- Explore the meaning behind why children chose or avoided specific places in their environment
- Examine the strengths of the methodology

Methods

Participants

The sampling took a convenience route, which allowed for basic data collection and trends. The only requirement for the participants was their age, in that they had to be between 10 and 12 years. The participants (n=15) were split into three groups; a group of five (all female), four (three girls and one boy) and another four (all male).

Setting

We carried out the study in Glasgow, Scotland, with participants from primarily urban areas.

Procedure

The participants were given a disposable camera and a plain sketchbook. We asked the participants to document their day-to-day location choices through photography or drawing. The participants were given a full week to carry out the data collection. Once complete the first author carried out a focus group with the children in groups of four (one all female, one all male, and one mixed gender group). Visual data collected by the participants were brought

to the discussion. The discussion was based around the photos and drawings each participant had collected, for instance, why they chose to take a certain picture, what it represented to them, and why they visited that located (for what purpose or activity). A creative task was included in the focus group which involved the children placing their own visual data under headings that were either positive or negative.

Analysis

Recordings of the interviews and focus group were transcribed and checked for accuracy. The transcripts, along with the complete set of photographs and drawings, were entered into NVivo to organize and categorize the data.

The analytic framework for the study was concurrent inductive and deductive thematic analysis (Fereday & Muir-Cochrane, 2006); themes generated from the data were both data-driven and theory-driven. The visual data were analysed following two alternative processes. The researcher coded the visual data solely on location and subject matter, without placing meaning onto what was represented within the picture. They were also analysed into themes by the participants during the focus group. This process of analysis was dependent on the meaning of the photographs as perceived by the child.

During the analysis, we drew from Gibson's theory of affordances (Gibson, 1977), considering the environment as something that is subjectively perceived rather than an objective existence. Gibson's theory of affordances prioritizes how individuals perceive their environment and what they feel their environment offers them.

Results

Initial analysis of the data generated raw codes that helped to organize the focus group and visual data into first and second order themes, which generated the five global themes. The five themes were Outdoor affordances, Spaces for play, Social influences, Location choices

and the visual environment. Further exploration of Outdoor Affordances will be discussed within this paper.

An example of findings

Outdoor affordances

The participants in our study made frequent reference to the lack of settings they felt they could go and play. This was a reoccurring issue within all three focus groups, and evident in both the visual and the verbal data. The data suggested that participants perceived few places to go, and that the equipment in most places was for younger children and 'not meant for them'. The children repeatedly noted many parks or play areas comprised of perceived but not actualised affordances. The children saw the equipment as something to be played on or with, but was did not actualise the affordance as it was considered unsuitable (i.e. equipment for toddlers or much younger children).

The female participants in particular, spoke frequently, not only about the perceived lack of age appropriate equipment, but also about the lack of equipment in general. The girls spoke of a desire for more equipment that they could use to play on.

Figure 2. Children's drawing

    Drawing of improvements to the environment

Can you think of any equipment that you would want to play on, or that

> **kids your age would like to play on?**
>
> Well like climbing frame, like bigger, big climbing frames, monkey bars, (overtalk) appropriate swings, that kinda thing.
>
> Table 2. Children's quotes
>
> Equipment to play on

Figure 3. Children's drawing

Drawing of age appropriate affordances

Activities were also discussed. The focus group that was comprised of solely boys discussed football as a primary activity they enjoyed outdoors. The specific location wasn't a key determinant; the children noted they played it at the local park, the nearby football pitch, and on the street.

> We normally walk to basically there's, well there's a few parks near us but we normally just stick, go to Lauderdale.
>
> **Is that…? Why is that the one you go to the most?**
>
> Because that's the one with the best football pitch
>
> Table 3. Children's quotes
>
> The best football pitch

Further, the participants noted they would not go somewhere on the basis of its ability to accommodate football and whether their friends were available to go and play football with them.

> **So the places that you three are talking about, would you go there if your friends weren't there? Would you go there by yourself?**
>
> No.
>
> It would probably be a bit boring without my friends, just kicking a ball into an empty net.

Table 3. Children's quotes

An empty net

Explorations of the data led to acknowledgement of the participants need for variety. One participant explained that she often stayed in her garden as a limited number of locations offered her the types of affordances she desired.

> I mean, my garden is really big, it's, there's lots of places you can, there's quite a lot of places you can go in my garden, and it's really easy to get lost in your mind in the garden, in my garden, so I don't go out much, but when I do I realise that there aren't really much places to go, so I'm kind of grateful that I have a big garden.

Table 4. Children's quotes

Gardens

Discussion

Comparisons to previous research

A limited number of studies have qualitatively explored outdoor environmental determinants of PA in children (Eyre, Duncan, Birch, & Cox, 2014), specifically how children's perceptions might influence where and why they choose certain locations in which to spend their time. Other studies have found similar results to the present study, determinants such as; parental restriction (Eyre, et al., 2014), safety (Loureiro, Matos, Santos, Mota, & Diniz, 2010), and social intimidation (Veitch, Salmon, & Ball, 2007) were all found to rate highly on children's perceived barriers to spending time outside.

Play affordances appeared to be a key determinant of where children spent their time in their environment. The study found that the participants frequently felt they had nowhere

to go, playgrounds were perceived as 'too young' for them and the equipment provided was not construed as usable affordances. The current paper found that the participants disliked the majority of playgrounds as they felt they had outgrown them. The participants of all focus groups, particularly the females, did not feel they had spaces in the environment they were able to go and be active. The male participants spoke primarily of football, which requires limited equipment; the girls spoke of more intricate ideas, such as zip wires, community gardens, tunnels, and tree houses. Though previous literature has done well to ascertain the reasons why adolescent female PA levels drop, to the authors knowledge this current study adds to the literature from looking at young females perceptions of activity affordances in their environment.

Other papers have recently started employing multiple qualitative methodologies (Pearce et al., 2009). The study provides a strong case that visual methods are a valid method when exploring the children's perceptions of the public outdoor environment. There was no photographic data of private gardens, and only one drawing depicting a private house. As far as it is known, no others studies have employed a creative task that encompasses visual data with a form of participant analysis. Using the creative task was particularly useful when employing meaning to the photographs and understanding how the participants chose to code their data. The most frequently reoccurring self-labelled box among the participants encompassed improvement of certain areas. The idea that the participants recognised which areas needed improvement and how they could be improved gives justification for policy makers, councils, and governments to ask children of this age how we could make a more appealing environment.

Strengths

The study provided a nuanced approach to understanding children's perceptions of their social and physical environment. Combining qualitative methods helped to explore the

research topic at multiple levels of knowledge. The visual data (photo elicitation and drawing) helped to see the world through the child's eyes, utilising both forms of visual data enabled the child to choose and limited children being asked to carry out a task where they may lack confidence or interest. The creative task combined with the focus groups elicited a strong discussion and helped to prevent the conversation from digressing. The creative task enabled the children to co-produce codes, and was valuable having both participant and researcher analyse the visual data, helping to prevent research bias. Overall, the children were enthusiastic about the methods and enjoyed taking control of the process. The chosen method structure has helped to further challenge knowledge hierarchies, in which adults are commonly relied upon to contribute valuable information.

Placing children in charge of data collection and participating in the analysis of the visual data enabled the researcher to confidently limit the level of researcher bias. Qualitative data and researcher bias go hand in hand due to the nature of the work, involving the children in as much of the researcher process as possible helped to limit bias. Further, it provided justification that children of a similar age are able to comprehend the research process and add valuable contribution to the study at various stages.

Limitations

The qualitative nature of the study limits transferability to other settings (Malterud, 2001). Each child offered their personal and unique views of their neighbourhood, which are not transferable to any other child. The researchers would also influence the data that is generated. The researcher that carried out the data collection was a 24 year old female; an older or male researcher may elicit different data from the participants. Therefore the results from the current study should be acknowledged within context to the study.

Papers have established the limitations of visual data (Wang & Burris, 1997). A primary concern with visual data is when researchers do not make explicit their conceptual or

theoretical framework (Harrison, 2002). Past researchers have noted that visual data cannot be critically analysed without contextual knowledge. The current study aimed to circumvent this limitation by recognising our use of Gibson's theory of affordances as being the theoretical driving force. Further, we acknowledged that the visual data were analysed based on location and subject matter, the researchers did not look to critically analyse the photos or drawings.

The implications of the study are specific to children of this age group. Older adolescents may find drawing and disposable cameras uninteresting; it is unlikely children younger than ten years would explore their environment independently of adults, and thus it is questionable to what extent their perceptions would reflect their adult relations.

Seasonality played a substantial part in the study as results would be influenced depending on the time of year the study was carried out. The first two studies (September – October) produced high quality images with all pictures in daylight. The last study took part at the end of November meaning some photographs were low in quality due to low lighting. The disposable cameras did have a flash option, but the children's experience with disposables was limited, and though instructions were given, children may have forgotten flash was not automatic.

Implications for policy and practise

At the level of interventions, our findings direct us away from children having a lack of personal motivation to go outdoors. The findings suggest approaches that emphasise increased environmental supportiveness of PA. There is a need to address the concerns of children of this age group in order to greater understand what they feel would encourage more outdoor play. A suggestion from the children was the lack of belonging in the environment, a solution they gave were spaces exclusively for the use of their age group (which they defined to be between eight and fifteen years old). The children felt safety was a

key concern when outdoors. Feelings of safety varied from social intimidation from strangers they felt were 'hanging around'.

Conclusion

The study's findings support previous literature that has suggested an unsupportive social and physical environment has the ability to limit children's PA outdoor opportunities (Grow & Saelens, 2010). Children responded well to the visual data approach, and discussed their ideas well within the focus group setting. Cleanliness and age appropriate equipment may be integral components to why children choose to avoid or visit certain locations in their environment. Providing resources such as more bins and preventing areas from becoming overgrown and unkempt may help to increase children's time outdoors and in turn potentially increase childhood PA levels.

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