



Toward an understanding of children's perceptions of their transport geographies: (non)active school travel and visual representations of the built environment

Caroline Fusco^{a,*}, Fiona Moola^a, Guy Faulkner^{a,1}, Ron Buliung^{b,2}, Vanessa Richichi^{c,3}

^a Faculty of Physical Education and Health, University of Toronto, 55 Harbord Street, Toronto, ON, Canada M5S 2W6

^b Department of Geography, University of Toronto at Mississauga, 3359 Mississauga Road N, South Building, Mississauga, ON, Canada L5L 1C6

^c OPHEA, 1 Concorde Gate, Suite 608, Toronto, ON, Canada M3C 3N6

ARTICLE INFO

Keywords:

Children
Photovoice methods
Built environment
School transport
Visual representation
Travel mode choice

ABSTRACT

Environmental measures that are designed to facilitate changes in opportunities for active school transport (AST) do not often account for individuals' interpretations of the built environment (BE) in different urban contexts. The Built Environment and Active School Transport (BEAT) project was undertaken to explore the ways in which the transport-BE interface gives rise to the use of active or non-active travel modes as the primary travel mode for school trips. We wanted to know how children experienced and understood the transport-built environment relationship. We selected four Toronto elementary school sites in areas that differed with respect to socio-economic status and built environment. We conducted photovoice interviews with 41 children, 21 who walked to/from school, and 20 who were driven. Adopting a thematic analytic approach, this paper examines the similarities and differences in the visual narratives of children's transport geographies and discusses some of the benefits of using photovoice with children in a study of the transport-built environment relationship.

© 2011 Elsevier Ltd. All rights reserved.

1. Introduction

Active school transport (AST; primary mode is walking or cycling to/from school) may be an important source of children's physical activity (Tudor-Locke et al., 2001) and has been proposed as a means of increasing youth's physical activity (Sirard and Slater, 2008).⁴ A recent systematic review found that children who walk or cycle to/from school tend to be more physically active overall than children who did not (Faulkner et al., 2009). Engaging in active school transport may also lead to other health and transport benefits (Badland and Schofield, 2005), such as avoiding the direct production of harmful mobile source emissions (e.g., particulates, CO, NO_x, HC). Ultimately, we are hoping that the BEAT research project, of children's early experiences with active transportation, might have implications for future adoption of active modes for obligatory and/or leisure activities as children age.

There is consistent evidence in western nations of a systematic decline in the use of active modes for trips to school including

within the region in the Greater Toronto Area (GTA), Canada's largest city-region. Between 1986 and 2001, the walking mode share for trips to school significantly declined (53–42% for 11–13 year olds, 39–31% for 14–15 year olds) (Buliung et al., 2009). Partly in response to this decline, the Heart and Stroke Foundation and the Canadian Institutes of Health Research called for proposals to study the relationship among built environments, obesity and health. Our funded project was a 3-year, multi-scale (province, city, neighbourhood) mixed-methods research study entitled Project BEAT-Built Environment and Active Transport. The overall goal of this project is to develop a Toronto and Ontario specific evidence base to support the development of policies and interventions to positively affect school travel behaviour in children.

A wide range of correlates of active commuting to school have been studied including demographic, individual and family factors, school factors, and social and physical environmental factors (see Sirard and Slater (2008) and Pont et al. (2009) for review). However, after reviewing the broader literature and recent reviews on AST (Sirard and Slater, 2008; McMillan, 2005; Davison et al., 2008; Pont et al., 2009), two central limitations are evident. First, research to date typically adopts a cross-sectional, survey methodology. These methods are often based on the assumption that the built environment is an unchanging entity, which exists independently of the meanings that participants ascribe to it. Indeed, parents' perceptions of the environment are a stronger predictor of AST than urban form variables (McMillan, 2005). Second, as others have recently noted, children's voices have only been

* Corresponding author. Tel.: +1 416 946 7717; fax: +1 416 971 2118.

E-mail addresses: c.fusco@utoronto.ca (C. Fusco), fiona.moola@utoronto.ca (F. Moola), guy.faulkner@utoronto.ca (G. Faulkner), ron.buliung@utoronto.ca (R. Buliung), v.richichi@utoronto.ca (V. Richichi).

¹ Tel.: +1 416 946 7949.

² Tel.: +1 905 569 4419.

³ Tel.: +1 416 426 7415.

⁴ We recognize that there are other active modes, but that the dominant active mode is typically walking, followed by cycling.

partially represented in this field of work (Mitchell et al., 2007). The ecological and cognitive active commuting (ECAC) framework, outlined by Sirard and Slater (2008), identified parents as primary decision makers in children's commute to/from school, up to a certain age. However, children's perceptions of the built environment potentially feedback through household conversations about activity and travel decisions. For example, children may express their like or dislike for walking to school or they may discuss aspects of their environment that they enjoy or feel threatened by. Perhaps, in the future, this feedback may be taken into consideration when parents decide on their child's mode of transport (Sirard and Slater, 2008)? We contribute to the nascent literature reporting qualitative research conducted with children around issues of active transport and the built environment. We wanted to explore children's perceptions of their environments when travelling to/from school and how these perceptions might differ depending on the primary mode of transport (active/non-active), socioeconomic status, and the transport and land use elements of the built environment.

2. Research strategy rationale and methodology

Few studies have investigated children's perspectives on school travel (Mitchell et al., 2007) because the predominant approach to researching children's experiences is grounded in 'research on' rather than 'research with' or 'research for' children (Darbyshire et al., 2005). Indeed, the views of children as active agents and 'key informants' in matters pertaining to their health and wellbeing are often ignored and neglected (Darbyshire et al., 2005). Children are often viewed as unsophisticated and thus incapable of being taken seriously in discussions about their needs (Oakley, 1994). While many federal, state and local policies can have significant effects on children's lives, especially on walking and bicycling behaviour (Sirard and Slater, 2008), children are assumed to possess little, if any, political influence, and the exclusion of their views in the political sphere is quite commonplace (Kulynych, 2001).

Studies that have examined children's perceptions of environments have shown that children have meaningful and insightful contributions to make, regarding, home, school, the availability of places to play and eat, opportunities for social interaction, as well as the availability of green space and climate change (Hume et al., 2005; Holt et al., 2008; Neuwelt and Kearns, 2006; Line et al., 2010). Research emerging from the fields of child, youth and environment studies, which draw on a variety of methods such as interviews, writing samples, cognitive mapping and photography demonstrate that children and adolescents are very cognizant of the links between health, physical activity places and travelling between home and school (Mitchell et al., 2007; Holt et al., 2008; Ross, 2007), and are able to articulate their future travel behaviour intentions (Line et al., 2010).

Our empirically grounded research, which incorporates researchers from diverse fields of study – transportation geography, behavioural theory, socio-cultural geographies of childhood and physical education and health – places the voices of children using active and non-active travel modes at the centre of the research design. We used photovoice methods to explore children's perceptions and representations of their environments. Photovoice is a methodology in which participants are asked to represent their environments or point of view by taking photographs, discussing them and developing narratives to go with their photographs. Hurworth (2003) suggested that photovoice has three goals: to enable people to record and reflect their community's strengths and concerns; to promote critical dialogue and knowledge about important issues through large and small group discussion of

photographs; to reach policy makers. Photovoice as a method in and of itself has been used to provide research participants the opportunity to "reflect on photographs that mirror the everyday social and political realities that influence their lives" (Wang et al., 1998, p. 80). Visual methods draw attention to how participants *see* and *frame* their social and cultural environments (Ball and Smith, 1992; Carlson et al., 2006; Dell-Clark, 1999; Grbich, 2007; Rollins, 2005). This idea of *seeing and framing* is particularly relevant for understanding the contextual factors that impact children's relationships with the mode choice process and the built urban environment, and prompted our use of photovoice. Evidence from children's qualitative studies has demonstrated that using multiple methods, especially photography, effectively engages children, allows them to document their social worlds and places their views and experiences at the foreground of the research process (Christensen and Prout, 2002; Darbyshire et al., 2005; Harrison, 2002; Mitchell and Reid-Walsh, 2002; Morrow, 2001; Orellana, 1999; Rasmussen, 2004; Ross, 2007). More specifically, for our purposes, photovoice has been successfully used to examine children's conceptualizations of health (Hume et al., 2005; Morrow, 2001) and to investigate the perceptions of elderly people about the walkability of their built environments (Lockett et al., 2005).

3. Sampling frame

We recognize the built environment as the fabric within and upon which the experiences of children unfold, and hence, how it is designed affects the construction of places and opportunities for the types of social interaction, and observations about transportation offered by children. Hence, four elementary schools in the GTA were selected based on differences in built form (e.g., looping versus grid-based street layout), characteristics typically thought to associate with systematic differences in physical activity and travel behaviour (Frank et al., 2003). Two schools were drawn from Toronto's inner suburbs (e.g., typically characterized as having curvilinear, looping streets, with arguably less pedestrian connectivity) and two schools were drawn from the traditional downtown core or central area (i.e., gridded streets, with arguably higher levels of pedestrian connectivity).

Beyond the built environment, we also sought to situate school mode choice within a broader discussion of income diversity. School selection involved an examination of school location against median household income (Statistics Canada, 2001) up to a distance of 1.6 km around each elementary school within our sampling universe (all elementary schools from the Toronto District School Board (TDSB) with grades five and six – 10–12 years old). Two schools were selected from within the highest income quartile (the median household income within a 1.6 km radial distance of the school was within the top 25% for the study area), located within built environments that essentially correspond with elements of pre-world war two traditional neighbourhood design (e.g., gridded streets and small blocks), and the period of post-war suburbanization (e.g., organic street design, looping streets and larger block-size). The same sort of selection was conducted for two schools from within the lowest income quartile. In Toronto, the distance of 1.6 km is important because it is typically the distance within which a school will collect 80% or more of its student population, and 1.6 km is also the threshold distance for subsidized (free) bus-sing services offered to elementary age students from junior kindergarten to grade 5 in the TDSB.

We received ethical approval for our study from our university's Office of Research Ethics and the Toronto District's School Board's External Research Review Committee (ERRC). Working with teacher facilitators at each school, we selected 10–11 children be-

tween the ages of 9 and 12 years (Grades 4–6) at each site (five children who engaged in AST at least three times a week and 5 who used non-AST means, e.g., drive/taxi/transit/school bus, to get to and from school at least three times a week. This age group (Grades 4–6) was identified based on data from our pilot study, which tested children's ability to articulate their experiences of the built environment and to use digital cameras, and, in consultation with schools, this age group of children was selected because they still traveled to school with a parent or a caregiver. With respect to travel mode, the distinction between AST and non-AST used was based on the most commonly used mode used for the trip to or from school.

Participants responded to flyers that were posted in schools and distributed by each teacher facilitator, and were invited to take part in the study based on their willingness to participate within the conditions and time-lines of the study. We arranged an information night for participants (parents and children) at each school site. At that time, parents signed a 'Consent to Participate' form for their child–parent dyad and each child also signed an 'Assent form'. Following this, demographic information was collected, data gathering procedures were explained to parents and children and photovoice interview schedules were arranged with children. Principles of protection, including pseudonyms, the right to refuse, withdraw, or stop interviews, as well as security and confidentiality of the data were implemented. At the information night in each site, all children (AST and non-AST) were given an easy-to-use digital camera, and instructed on its use. All digital cameras were pre-loaded and programmed to hold a total of 16 photographs. Participants were instructed to take photographs of places, objects, or things that they noticed, liked, or disliked or those things in their environment that were important to them during their journey to (eight photographs) and from (eight photographs) school. Children took their eight photographs on their journey home from school the day before their photovoice interview and eight photographs on their journey to school on the day of their photovoice interview. All digital photographs were loaded onto laptop computers and each child participated in a structured photovoice interview with a research assistant in a quiet room in the school. In this interview, the research assistant asked each child about her/his journey to school and about her/his photographs (e.g., why they took their specific photographs and what their photograph represented about their journey to and from school).

4. Data analysis

While there are a variety of approaches to the use and interpretation of photographic data (Hurworth, 2003), we conceptualized the photographs as documents (Cannuscio et al., 2009), which illustrate children's perspectives on their built environments and transport geographies. The visual images are treated as data that are important for understanding children's ideas about their journey, environment, and traffic for example. While photographic analysis alone may not be able to reveal the intent of the photographer or the meaning he/she attaches to the image (Cannuscio et al., 2009), children's narratives about their photographs were used to clarify their representations. Photographs were classified according to the following criteria:

1. School's name first initial: **B, D, R, T.**
2. Participant (parent or child): Child – **C** Parent – **P** (A concurrent study was being conducted which involved obtaining measures of parent's perceptions of the environment using photovoice).
3. Participant number: **1–10 (a/b)** appendage if 2 children from same household participated).

4. Mode of travel to/from school (on day photograph was taken): Active – **A**, Non-active – **N**.

For the purposes of this paper, we have coded the children's narratives according to their mode of travel (AST or Non-AST), SES of neighbourhood (low or high) and built environment (grid or looping). The photographs were analyzed for content based on the location and subject matter of the photographs and each photograph was categorized according to the dominant theme or visual item as expressed by children in their interviews. For example, visual items such as trees, garbage cans, schools, homes, or stores, were identified and coded. The next level of analysis consisted of grouping together common visual items into an initial or provisional visual theme. For example, visual items such as trees, animals, flowers, gardens, and leaves were grouped into a broader category termed the "natural environment". Categories were carefully refined in order to ensure the conceptual distinction between categories, which led to a broad thematic analysis of children's visual representations. Overall, thirteen thematic categories were identified including: Nature/Aesthetics, Animals, Eyesores, Street Signs/Lights, Houses/Apartment buildings, Play-areas, School and Surroundings, Structural Features, Vehicles/Traffic, Advertisements/Signs, People, Commercial Enterprises, and Other Buildings. An X-cel™ spreadsheet was developed to manage the data and this allowed an initial analysis of the frequency of photos from these categories on the basis of travel mode, school neighbourhood socioeconomic status, and built environment (looping versus gridded street networks).

This initial data management process sensitized the authors to trends in the quantity of photos being taken of different categories. However, we were interested in the children's photovoice narratives rather than the quantity of photos being taken (see Harrison, 2002; Ross, 2007). Using a procedure similar to the thematic analysis of photographs, researchers read the children's interviews and searched for commonly occurring themes, which were coded and grouped together into broader thematic areas and categories. Finally, photographs and narratives were cross-referenced and compared to develop a broad thematic analysis of children's representations of their built environments and (non)active transport.

5. Results

Some of the key similarities and differences in children's visual representations of their built environments and transport geographies are now described. These include: (i) home and school as places of comfort and safety, and (ii) signs and symbols as journey landmarks.

5.1. Similarities in visual representations

5.1.1. Home and school: journey origins and destinations

Children's photographs and accompanying narratives, not surprisingly, illustrated that their homes and schools represent places of meaning and importance, as well as safety. These were described as familiar, comfortable, and secure sites for children. Most respondents (AST and non-AST) described their homes as places where they could rest, relax, and engage in their own activities, and they told stories about the significance of their homes and its surroundings in their lives.

Child: This one is the picture of our tree. And it's really, really tall. And its just part of me.

Interviewer: It's part of you. What do you mean that it's part of you?



Fig. 1. Tree at house.

Child: Cause it's always been there my whole life. This one is also my tree. This one is really tall as well. I really like it because it's also been with me my whole life as well. And like, this is my room and I can see it right there. I think about squirrels and stuff 'cause I always see them like chasing each other (AST, high SES, grid) (see Fig. 1).

Children's homes were spatial landmarks, acting as meaningful sites of origin at the beginning of the day and a destination point at the end of each day for both AST and non-AST children.

Similarly, regardless of the built environment context, all participants talked about how much they enjoyed school. To them, their schools represented a place of safety, familiarity, enjoyment and opportunity. Children recalled school related events and activities such as carnivals, pizza days and playground adventures when showing their photographs of school.

Child: This is a picture of my wonderful school.

Interviewer: What do you think about your school?

Child: Its fun... there's lots of special programs going on and there's usually pizza more than the other school I go too. Then whenever there is pizza lunch, you are going to pizza lunch and not staying home (AST, low SES, looping) (see Fig. 2).

Children attending low SES schools (schools in lowest income quartile according to the 2001 Census of Canada median household income within a 1.6 km radial distance of the school) sometimes expressed their disdain for living in cramped and crowded housing complexes. This built environment and SES category interaction with respect to housing was reflected in their visual representa-



Fig. 2. School building.

tions. For example, in comparison to the children who attended high SES schools (schools in highest income quartile according to the 2001 Census of Canada median household income within a 1.6 km radial distance of the school), children from low SES schools took fewer photographs of their home spaces. However, overall, home and school were depicted as important and meaningful places in the school trip for both AST and Non-AST children because they invoked a sense of familiarity, comfort, freedom and play.

5.1.2. Signs and symbols: journey landmarks

All participants (AST and non-AST) photographed signs in their environments and discussed the importance of neighbourhood signage. Both AST and Non-AST children explained that signs indicated safe areas for playing, places where traffic should slow down, or where there was construction work. Children talked about using signs for wayfinding—signs indicated where they were and prevented disorientation in the built environment. All children suggested that signage helped them feel more safe and helped them know the way to and from school. Additionally, both AST and non-AST children suggested that signage ensured order and organization in their neighbourhoods and in the broader community.

I took a picture of that because if there was no stop signs in the world, there would be a lot of crashes and a lot of people dying. And everything would be out of control and no one, and there's not anything there to tell you what you can and can't do. And that's, that sign is right when you come right out of school the curb, is that stop sign right there (non-AST, high SES, looping) (see Fig. 3).

I think it's important for the drivers to see it, so that the drivers will know that people will be crossing that way and no one gets hurt (AST, high SES, grid) (see Fig. 4).

All AST and non-AST children were fully aware of the different types of signs in their environments. They believed that signs ensured both children's personal and collective safety and thus were important objects in their built environments.

Places such as home and school and signage conveyed a sense of safety to many of the children we interviewed. Not surprisingly, then, AST and non-AST children's representations of these places and objects were similar across the built environment categories of the sampling frame.

5.2. Differences in representations

5.2.1. Natural and social environments: framing the school trip

Both AST and non-AST children photographed and dialogued about the natural environment and expressed positive perceptions



Fig. 3. Stop sign.



Fig. 4. Pedestrian sign.

towards nature (i.e., trees, flower beds, pathways, forests, flowers, gardens, and green space). Although all children's photographs and interviews contained representations of the natural environment and all children talked about it being important and meaningful, AST children's photographs and descriptions illustrated a type of micro-focus on the environment, and an attention to detail that was relatively absent in non-AST children's photographs and narratives. While non-AST participants used generalities to describe the environment, AST children specifically photographed and dialogued about leaves, flowers, mushrooms, etc. In this regard, their relationship to the environment was particularly "close". When they talked to research assistants about their photographs, they often spent a few minutes in the interview contemplating why or how something appeared the way it did (e.g., a particular pattern on a leaf or the way something grows).

This one is a picture of a really nice leaf and I took it because it's red and how it doesn't really blend in with the other colours. But it's just on the ground, and it's ... just like, it doesn't blend so I took a picture of that (AST, high SES, grid) (see Fig. 5).

In contrast to this specificity, non-AST children used less detail when they described the environment. Indeed, they seemed to have a more detached relationship with the natural environment and this was illustrated in how they were distracted sometimes from following their thoughts about their environments.

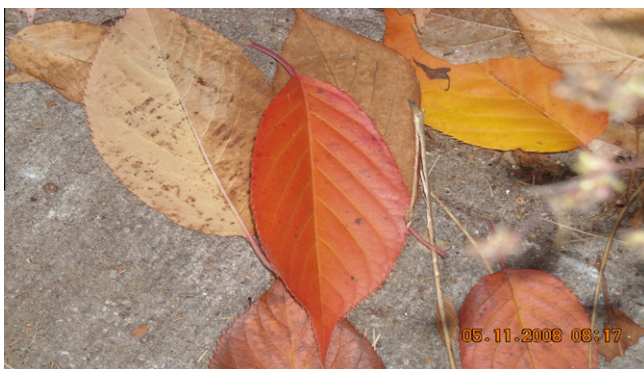


Fig. 5. Leaves.

Oh, that's the ... all the trees. *It's not the valley. Oh yeah, it is the valley.* It makes me think of all the trees and how pretty it is. Yeah, and it shows the car. Yeah, because it [the valley] was on the other side of me (non-AST, high SES, looping) (see Fig. 6).

While non-AST children talked about their affinities with the natural environment, for the most part their perspectives were substantially different from AST children because of their position in the car and the speed at which they travelled. Car travel allowed them no time to stop and contemplate nature on their journeys to/from school: instead their perspectives of the world outside the car were often framed by the car window or blurred.

Additionally, AST children more than non-AST children talked about the importance of friendly people-neighbours, other children, crossing guards, parents- and animals on their way to/from school. In this regard, AST children appeared to derive much pleasure and enjoyment from interacting with other human and non-human species on their way to/from school. Seeing familiar, friendly children and adults, and even animals, diminished feelings of isolation and loneliness.

Child: I took this picture because I enjoy cats a lot. I've got two of them at home and it's sort of just really cute, and I just really like that picture.

Interviewer: Yeah. What do you like about cats? Or like seeing them on your way to school?

Child: I think it makes it much more ... I was talking about loneliness a couple of questions ago and when you see these guys you are just like, "Oh I am not alone". It's just, they are sort of like a person but they're not (AST, high SES, grid) (see Fig. 7).

AST children's photographs and narratives of their social environments indicated a level of engagement not apparent in non-AST children's accounts. In fact, they described social interactions on the way to and from school as important: thus there was a social benefit associated with AST. Obviously, non-AST children had fewer opportunities to interact socially with peers or other people on their way to school: their social interaction was with their parent or caregiver, whoever was driving the car. In this next quote, one non-AST commuter demonstrated frustration with 'social interactions' (with others in their cars).

That's going into the parking lot. And sometimes it gets on my nerves a little bit how people will turn and block off, because they don't think that they will block off part, and then there's a lot of traffic. Here, we are just waiting but



Fig. 6. Trees from car.



Fig. 7. Cat on porch.

sometimes there's a lot of cars and they park right by the school door to drop off their kids. But then you have to wait because there's a lot of obstacles (non-AST, high SES, looping) (see Fig. 8).

Non-AST photographs of their social environments were taken when they were not travelling, (e.g., photographs of their house before they left home in the morning in the car) or photographs of their school buildings when they arrived at their destination (e.g., school yard).

5.2.2. Traffic: volume, control systems, and driver behaviour

Children (both AST and Non-AST) talked about many traffic-related barriers to AST; drunk drivers, speeding, running red lights, drivers talking on cell phones, reduced driver concentration, too much road congestion, busy intersections, as well as crowded school parking lots and drop-off zones. Children considered these factors to be very risky for all children. Indeed, practically every child we interviewed expressed fears of being hit by a car in a traffic accident. Interestingly, traffic fears were magnified among non-AST children, and many took photographs of dangerous intersections or streets.

This is like the turn that goes to our street. It's pretty sharp because you are going so straight and then it's like a curve comes out of nowhere. So it's a really sharp curve. And also I think that adults have to be very careful at that curve because a couple of days ago, there was this little kid on



Fig. 8. Car in parking lot.

this scooter, on the way back home, he was just driving on the curb and I heard that this car drove by and was so close to hitting him. And I don't think that sharp curve should be there on, like a neighbourhood street (non-AST, high SES, looping) (see Fig. 9).

All children (AST and non-AST) photographed busy street intersections and heavy traffic and expressed their disdain for high traffic volume. However, while all children underscored how important it was for adults to engage in safe and responsible driving and to be conscientious of children when driving, for AST children, cars remained only one aspect of their built environments. Despite the fact that many of these children had to cross busy intersections, the attention of some AST children was more broadly focused on built (planned or unplanned) environments as a whole and not just on cars and their potential dangers.

Child: That's where I walk to school, right there. And, by accident, a car got into my picture. And there's someone doing cross country. I have got to wait at the light, and then, that's the way I go to school.

Interviewer: This is your pathway to school, okay. Do you like this pathway? What do you like about it?

Child: It's because you get to see the whole field and other people sometimes are on your left or your right hand. If you are walking this way [they are on] your left hand and if you are walking back they're on your right (AST, high SES, looping) (see Fig. 10).

While cars were thought to be a necessary and important feature of social life, many children worried that drivers could hurt children by speeding or engaging in drunk driving. For some children (AST and non-AST), cars were thought to make the travelling environment hostile, and for others (AST) cars were just another part of their urban or suburban landscape. For children living in both low SES neighbourhoods, the frequency of photographs for vehicles/traffic was high.

While all children in the study talked about nature, social interactions and traffic, AST and non-AST representations of these aspects of their transport geographies were qualitatively different. Children's perspectives and visual representations were directly related to their mode of transport and appeared to be less directly influenced by factors related to the built environment or socioeconomic status of the school neighbourhood.

6. Discussion, conclusions, research and policy implications

We believe that the development of domestic policy around AST requires local evidence. While it appears likely that policy



Fig. 9. Streetscape from car.



Fig. 10. Intersection and traffic lights.

decisions at the school, local, state or federal level have an indirect effect on active commuting to/from school (Sirard and Slater, 2008), in the policy making/reform process, children's views are rarely taken into consideration. We set out to qualitatively explore children's experiences and perceptions of AST and non-AST journeys to and from school and believe that our findings extend current literature on children's AST by adding children's visual narratives into the discussion of transport geographies.

Significantly, the use of photovoice to document AST and non-AST children's perceptions of their transport modes and the built environment gave child research participants an opportunity to represent salient aspects of their school travel experience and the environments within which school travel occurs in ways that researchers (and perhaps other adults in their lives) would not know otherwise. The inclusion of visual methodologies in research supports a move towards the new *sociology of children's health and children's geographies*; where "the child" is thought to be an agentic health subject who is able to make valuable, competent, informed, and meaningful contributions towards research agendas that affect their lives directly (Aitken, 2001; Darbyshire et al., 2005; Mayall, 1998). Using photovoice to understand children's everyday geographies of transport to and from school demonstrates our commitment to inclusive child-centred methods, children's diverse and multiple forums of expression and communication, and recognizes children's agency in the production of research knowledge.

While parents/guardians remain the key decision-makers regarding AST (Faulkner et al., 2010), this paper demonstrates that children's perceptions and understandings of their environments are sophisticated, unique and should be considered when planning for AST. Our study's findings add to Mitchell et al.'s (2007) research on children's experiences of the space between home and school in Auckland, New Zealand. Mitchell et al. used the concept of "island" geography to describe the perceptions and experiences of children who were driven to and from school. They concluded that these children were only cognizant of the places that they were chauffeured to and from. With reduced ecological acuity, it is proposed that they are "seeing more and learning less" (p. 616). These children did not engage with the "local spaces in between", which are critical to learning about the environment. In our study, AST children took more photographs of nature/aesthetics (e.g., gardens, plants, trees, flowers) and built environment features (e.g., sidewalks, curbs, roads) than non-AST children. Mitchell et al. suggest that the physical and social worlds available to children who are driven are shrinking and that there may be "a generation of children who are largely unfamiliar with their local neighbourhoods"

(p. 616). This confirms what ecologists and environmental psychologists call the extinction of experience. In ecology, the extinction of experience refers to the estrangement of people from nature in a fast moving urban world, and the subsequent apathy toward conservation and preservation that follows this estrangement (Pyle, 1978; Miller, 2005).

Non-AST children in our study were neither oblivious to, or uninterested in, their environments and indeed lamented that travelling by car prevented them from "slowing down to take another look" at interesting things on the way to and from school. AST of course occurs more slowly than non-AST – this difference in the speed of movement also affords opportunities for reflection and provides enough time for the "environment" to actually cognitively register with AST children. These children remembered details and told stories about their environments because they experienced moving through them at a slower pace than would be the case if they were driven. If a goal of the parent driver is to optimize the travel time (see Faulkner et al., 2010) then the goal becomes one of "getting to school", i.e., travel for the sake of getting to the activity at the destination, rather than the travel unravelling or being experienced as an activity in its own right, that is then followed by the school activity.

The observed interaction between mobility and environment, in fact, reminds us of the work of Rapoport (1987) who proposed that people travelling in motorized vehicles perceive less detail within the travel environment, while those travelling by active modes such as walking or biking are able to acquire a more detailed representation of the activity and travel environment. The perceived sense of distance from 'natural' and/or planned green space offers evidence in support of the hypothesis that the rise of the mobile society may indeed be producing increased estrangement from natural environments (Miller, 2005). The data also support Kahn's (2002) contention that the "seeds of estrangement" may be planted in childhood. Thus, if we want a generation of children and young people to grow up with attachments to the environment, policy measures may need to promote AST as a means to increase opportunities of environmental engagement. Moreover, policies that are more broadly directed at how children and youth travel to school and other activities should consider this estrangement problem.

Regardless of the mode of transport to school, all the children in this study appear to recognize the importance of home, school and street signs. The presence of some similarities across the subject(s) of their photography, arguably, demonstrates that these 'sites' and signs are equally important to and affect all school aged children, generally, regardless of travel mode (walking or driving in this study). Children's attention to signs in this study confirms Mitchell et al.'s (2007) findings: they note that young commuters are aware of drivers' carelessness and often take responsibility for their own safety by paying attention to signs. Children's reference to school and home as meaningful places confirms sociology of childhood and cultural geography studies that suggest that for children home and school are simultaneously places of belonging and comfort, as well as sites of power relations and control (Holloway and Valentine, 2000; Mayall, 1998; Mitchell and Reid-Walsh, 2002). Children's depictions of home and school in this study might "... reproduce the same spatial ideology that children's place is in the home [or school]..." (Holloway and Valentine, p. 17). However, their incursions into public spaces (particularly through AST journeys to/from school, even though under the guidance of an adult or caregiver) and their photovoice stories of those journeys demonstrate that children "can and do participate in decisions about themselves that seem to call into question the idea that by definition as children, they are innocent and unknowing" (Mitchell and Reid-Walsh, 2002, p. 7).

Finally, the influence of SES on children's AST is not clear with current research demonstrating positive, negative, or insignificant relationships between SES variables and travel mode (Sirard and Slater, 2008). The findings from our photovoice interviews do indicate some differences in representations between children who attend schools in neighbourhoods differentiated by SES. We did find that children from high SES neighbourhoods tended to take more photographs of nature and street signs and fewer photographs of traffic and people compared to children from low SES neighbourhoods. Mitchell et al. (2007) demonstrated that children's safety concerns are highest in low socioeconomic status schools, and Kearns et al. (2003) concluded that, as pedestrians, children from lower SES neighbourhoods encounter greater safety risks on the way to school. This is particularly important given that children in low SES neighbourhoods may tend to use active modes more than others – in other words, children from low SES neighbourhoods are engaged in the “desired” outcome (AST) but are burdened by lower quality infrastructure to support active transportation (Mitra et al., 2010).

Although we found that participants in our study did not experience their school travel in homogeneous ways, their photovoice narratives could be used to advocate for increasing rates of AST. If policy makers want to improve AST rates across SES groups and urban form, then the profound socio-economic disparities that exist in metropolitan areas like the Greater Toronto Area need to be addressed or AST promotion will fail (McDonald, 2008). Additionally, AST promotion initiatives and interventions need to pay attention to the diversity of children's perceptions of their transport geographies in order to develop SES and built environment-specific programs. Concurrently, policy makers need to tackle issues of parental convenience and work schedules directly (Faulkner et al., 2010), as well as developing child-centred interventions and school transport policies that reflect children's perceived benefits of AST and their everyday experiences of the built environment. A cautionary note, however, Kearns and Collins (2003) argue that while children's journeys between home and school have become increasingly problematic in Western cities as a result of intensifying traffic and safety concerns, taken-for-granted AST initiatives (e.g., walking school buses) offer participants a highly ambivalent form of empowerment and spatial freedom that is contingent upon adult surveillance and disciplinary power (p. 193).

The children, within the age group we investigated (Grades 4–6), are still controlled and influenced by their parents' decision making about school trip mode (see Faulkner et al., 2010). Indeed, parents reported that although their children engaged in discussions about school travel plans, most often, they (the parents) did not take their requests seriously and based their family school travel plans on what was the “quickest and easiest” journey to school (Faulkner et al., 2010). However, AST and non-AST children's photovoice stories, which depict the kinds of relationships that they can have with their environments when engaging in AST (see also Mitchell et al., 2007), point to children as possible agents of change with respect to active transport geographies – if their stories are proactively taken up in ways that allow children's co-construction of a socially and environmentally just public sphere (Sutton and Kemp, 2006).

Finally, given our findings to date, we advocate a longitudinal study that tracks whether early adoption of active school transport (AST) can potentially give rise to longer-term improvements in health status, with active travel decision-making becoming part of the adult experience. It is important to conduct research of this sort across different places with a view to being able to contrast local nuances with themes that arise universally across studies. Given the importance of children's independent mobility in explaining physical activity levels (Page et al., 2009), understanding the perceptions and experiences of school-aged children should

continue to drive research interests in the geographies of AST and built environments.

Acknowledgments

This research was funded by the Built Environment, Obesity and Health Strategic Initiative of the Heart and Stroke Foundation and the Canadian Institutes of Health Research (CIHR).

We would like to thank Raktim Mitra, Doctoral Candidate, Department of Geography and Program in Planning, University of Toronto, for providing technical and study design assistance on the BEAT Project.

References

- Aitken, S., 2001. *Geographies of Young People: The Morally Contested Spaces of Identity*. Routledge, London.
- Badland, H.M., Schofield, G.M., 2005. The built environment and transport-related physical activity: what we do and do not know. *Journal of Physical Activity and Health* 2, 435–444.
- Ball, M., Smith, G., 1992. *Analyzing Visual Data*. Sage, Newbury Park, CA.
- Buliung, R., Mitra, R., Faulkner, G., 2009. Active school transportation in the Greater Toronto Area, Canada: an exploration of trends in space and time (1986–2006). *Preventive Medicine* 48 (6), 507–512.
- Cannuscio, C.C., Weiss, E.E., Fruchtmann, H., Schroeder, J., Weiner, J., Asch, D.A., 2009. Visual epidemiology: photographs as tools for probing street-level etiologies. *Social Science and Medicine* 69 (4), 553–564.
- Carlson, E., Engebretson, J., Chamberlain, R., 2006. Photovoice as a social process of critical consciousness. *Qualitative Health Research* 26, 836–852.
- Christensen, P., Prout, A., 2002. Working with ethical symmetry in social research with children. *Childhood* 9 (4), 477–497.
- Darbyshire, P., MacDougall, C., Schiller, W., 2005. Multiple methods in qualitative research with children: more insight or just more. *Qualitative Research* 5, 417–436.
- Davison, K., Werder, J., Lawson, C., 2008. Children's active commuting to school: current knowledge and future directions. *Preventing Chronic Disease* 5, 1–10.
- Dell-Clark, C., 1999. The autodrive interview: a photographic viewfinder into children's experiences. *Visual Sociology* 14, 39–50.
- Faulkner, G., Buliung, R., Flora, P., Fusco, C., 2009. Active school transport, physical activity levels and body weight of children and youth: a systematic review. *Preventive Medicine* 48, 3–8.
- Faulkner, G.E.J., Richichi, V., Buliung, R.N., Fusco, C., Moola, F., 2010. What's “quickest and easiest?”: parental decision making about school trip mode. *International Journal of Behavioral Nutrition and Physical Activity* 7, 62.
- Frank, L.D., Engelke, P.O., Schmid, T.L., 2003. *Health and Community Design: The Impact of the Built Environment on Physical Activity*. Island Press, Washington, DC.
- Grbich, C., 2007. *Qualitative Data Analysis: An Introduction*. Sage, London.
- Harrison, B., 2002. Seeing health and illness worlds – using visual methodologies in a sociology of health and illness: a methodological review. *Sociology of Health and Illness* 24 (4), 856–872.
- Holloway, S., Valentine, G., 2000. *Children's Geographies: Playing, Living, Learning*. Routledge, London.
- Holt, N.L., Spence, J.C., Sehn, Z.L., Cutumisu, N., 2008. Neighborhood and developmental differences in children's perceptions of opportunities for play and physical activity. *Health and Place* 14 (1), 2–14.
- Hume, C., Salmon, J., Ball, K., 2005. Children's perception of their home and neighborhood environments, and their use association with objectively measured physical activity: a qualitative and quantitative study. *Health Education Research* 20 (1), 1–13.
- Hurworth, R., 2003. Photo-interviewing for research. *Social Research Update* 40. <<http://sru.soc.surrey.ac.uk/SRU40.html>> (retrieved 29.06.09).
- Kahn Jr., P.H., 2002. Children's affiliations with nature: structure, development, and the problem of the environmental generational amnesia. In: Kahn, P.H., Jr., Kellert, S.R. (Eds.), *Children and Nature: Psychological, Sociocultural, and Evolutionary Investigations*. MIT Press, Cambridge, MA, pp. 93–116.
- Kearns, R., Collins, D., 2003. Crossing roads, crossing boundaries: empowerment and participation in a child pedestrian safety initiative. *Space and Polity* 7, 193–212.
- Kearns, R., Collins, D., Neuwelt, P., 2003. The walking school bus: extending children's geographies? *Area* 35, 285–292.
- Kulynych, J., 2001. No playing in the public sphere: democratic theory and the exclusion of children. *Social Theory and Practice* 27 (2), 231–264.
- Line, T., Chatterjee, K., Lyons, G., 2010. The travel behaviour intentions of young people in the context of climate change. *Journal of Transport Geography* 18, 238–246.
- Lockett, D., Willis, A., Edwards, N., 2005. Through senior's eyes: an exploratory qualitative study to identify environmental barriers to and facilitators of walking. *Canadian Journal of Nursing Research* 37 (3), 48–65.
- Mayall, B., 1998. Towards a sociology of child health. *Sociology of Health and Illness* 20 (3), 269–288.

- McDonald, N.C., 2008. Critical factors for active transportation to school among low-income and minority students. Evidence from the 2001 National Household Travel Survey. *American Journal of Preventive Medicine* 34, 341–344.
- McMillan, T., 2005. Urban form and a child's trip to school: the current literature and framework for future research. *Journal of Urban Planning* 19 (4), 440–456.
- Miller, J.R., 2005. Biodiversity conservation and the extinction of experience. *Trends in Ecology and Evolution* 20, 430–434.
- Mitchell, C., Reid-Walsh, J., 2002. *Researching Children's Popular Culture: The Cultural Spaces of Childhood*. Routledge, New York.
- Mitchell, H., Kearns, R.A., Collins, D.C.A., 2007. Nuances of neighbourhood: children's perceptions of the space between home and school in Auckland, New Zealand. *Geoforum* 38 (4), 614–627.
- Mitra, R., Buliung, R.N., Faulkner, G., 2010. Spatial clustering and temporal mobility of walking school trips in the Greater Toronto Area, Canada. *Health and Place* 16 (4), 646–655.
- Morrow, V., 2001. Using qualitative methods to elicit young people's perspectives on their environments: some ideas for community health initiatives. *Health Education Research* 16 (3), 255–268.
- Neuwelt, P., Kearns, R., 2006. Walking is good for my health! Perceptions of the benefits of walking school buses in Auckland, New Zealand. *Children, Youth, & Environments* 16, 120–140.
- Oakley, A., 1994. Women and children first and last: parallels and differences between children's and women's studies. In: Mayall, B. (Ed.), *Children's Childhoods Observed and Experienced*. The Falmer Press, London, pp. 13–32.
- Orellana, M., 1999. Space and place in an urban landscape: learning from children's views of their social world. *Visual Sociology* 14, 73–89.
- Page, A.S., Cooper, A.R., Griew, P., Jago, R., 2009. Independent mobility in relation to weekday and weekend physical activity in children aged 10–11 years: the PEACH project. *International Journal of Behavioral Nutrition and Physical Activity* 7, 17–22.
- Pont, K., Ziviani, J., Wadley, D., Bennett, S., Abbott, R., 2009. Environmental correlates of children's active transportation: a systematic literature review. *Health & Place* 15 (3), 849–862.
- Pyle, R.M., 1978. The extinction of experience. *Horticulture* 56, 64–67.
- Rapoport, A., 1987. Pedestrian street use: culture and perception. In: Moudon, A. (Ed.), *Public Streets for Public Use*. Van Nostrand Reinhold, New York, pp. 80–94.
- Rasmussen, K., 2004. Places for children—children's places. *Childhood* 11 (2), 155–173.
- Rollins, J., 2005. Tell me about it: drawing as a communication tool for children with cancer. *Journal of Pediatric Oncology Nurses* 22 (4), 203–221.
- Ross, N., 2007. 'My journey to school...': foregrounding the *meaning* of school journeys and children's engagements and interactions in their everyday localities. *Children's Geographies* 5 (4), 373–391.
- Sirard, J.R., Slater, M.E., 2008. Walking and bicycling to school: a review. *American Journal of Lifestyle Medicine* 2 (5), 372–396.
- Statistics Canada, 2001. Census of Canada. <<http://www12.statcan.ca/english/census01/home/index.cfm>> (retrieved 27.06.11).
- Sutton, S., Kemp, S., 2006. Young people's participation in constructing a socially just public sphere. In: Spencer, C., Blades, M. (Eds.), *Children and their Environments: Learning, Using and Designing Spaces*. Cambridge University Press, London, pp. 256–276.
- Tudor-Locke, C., Ainsworth, B., Popkind, B., 2001. Active commuting to school: an overlooked source of children's physical activity. *Sports Medicine* 31, 309–313.
- Wang, C., Wu, K.-Y., Zhan, W.-T., Caravano, K., 1998. Photovoice as a participatory health promotion strategy. *Health Promotion International* 13, 75–86.