

Access, Health and Independence: Walkability and Children's Quality of Life

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Abstract: Improving the walkability of urban environments is an objective of planners and urban designers. Cities are being planned so that walking is more feasible and attractive in order to encourage increased rates of walking and thus improve the quality of life. Quality of life, however, can be conceptualised in different ways, depending on particular ethical assumptions or on differences between individuals and groups. Does the way that quality of life is conceptualised influence how planners need to approach the issue of walkability? This paper addresses this question in relation to children's walking. Drawing on a case study of a Western Australian primary school we investigate three ways in which walkability is linked to the quality of life of children: being able to access places; improving physical health; and enabling independence. A survey of children and their parents, photo-collage, and trip diaries are used to compare the way that issues of quality of life are constructed in relation to walking and the walkable environment. We argue that whilst there are many common characteristics between walkability for children, as important either for access, health, or independence, there are also tensions between these three qualities.

Introduction - Walkability, Quality of life and the Built Environment

Issues of quality of life, or wellbeing, in relation to living in cities, are bound up with the processes of urban function, design, and development. Understanding how built environments support the quality of life of people is therefore an important consideration for planners, urban designers, and those involved in the governance of local urban environments. Planning literature is littered with concepts such as 'spatial quality' (Albrechts et al 2003; Schreurs 2007); environmental quality (Rapoport 1982); quality of urban life (Marans and Stimson 2011); community quality (Smith, Nelischer and Perkins 1997); and built environment quality (Dempsey 2008; Southworth 2003; Walford et al 2011). These concepts encompass the physical planning elements, such as density, the variety of land uses and connectivity of transport networks, as well as the human response to the built environment including feelings of security and safety, access to goods and services, and the aesthetic values of urban environments. Pacione (2003) notes that central to an understanding of issues of quality of life are the relationships between people and the environments in which they conduct their everyday activities.

Walking is an important everyday activity and mode of travel. The walkability of urban environments hence integrates notions of the quality of the space of the urban environment and the quality of life. Southworth (2005, 248) provides a definition of walkability as:

“...the extent to which the built environment supports and encourages walking by providing for pedestrian comfort and safety, connecting people with varied destinations within a reasonable amount of time and effort, and offering visual interest in journeys throughout the network”.

Implicit in Southworth's definition is a relationship between four elements: the act of walking (function); the spatial arrangements of activities; the material characteristics of the built environment; and different aspects of quality of human life, such as comfort and visual interest. Southworth goes on to outline a series of performance criteria that refine his definition of what a walkable urban environment is, including the connectivity of the path network; links to other transport modes; mixed and varied land uses; safety from both physical and mental harm arising from traffic, criminal activity or violence; a high quality and legible walking environment; and an environment that is aesthetically pleasing and interesting (Southworth 2005, 249). Each criterion reflects ways that urban environments impact on our wellbeing shaped through everyday activities.

Wellbeing, or quality of life, can be understood in different ways. From a utilitarian perspective, wellbeing can be based on the experience of pleasure, the degree of satisfaction an individual experiences or, alternatively, on the absence of pain or suffering. In this respect quality of life is based on subjective feelings of wellbeing (Phillips 2006). On the other hand, understanding wellbeing as stemming from the satisfaction of basic needs differs to the utilitarian perspective in that it does not necessarily rely on subjective notions of 'happiness' or pleasure. The concept of needs shifts the focus of wellbeing away from thinking about maximizing pleasure, happiness and utility towards achieving minimum standards of quality of life, such as nutritional intake, literacy and recommended minimum amounts of physical activity. The capabilities approach, derived from the work of Amartya Sen and Martha Nussbaum (Nussbaum and Sen 1993), provides a more holistic notion of quality of life compared to one based on subjective feelings of pleasure or the satisfaction of basic needs; one that is based on the satisfaction and happiness of individuals in relation to what they aspire to do and their freedom to achieve their aspirations. This paper will explore these perspectives and consider the implications for the way research approaches can be adapted to respond to issues related to children's walking.

Children's active mobility and Quality of Life

For children's mobility, the issue of wellbeing is evident in three interrelated areas.

Health

Active modes of travel are associated with a range of positive health outcomes. There has been a great deal of interest in walking as a form of active travel emerging from concerns over the rising obesity rates (Moudon and Lee 2008; Saelens et al 2003) as higher rates of walking have been found to decrease the risk of obesity (Frank et al 2006). Regular walking may have greater benefits than more structured yet infrequent forms of exercise, such as jogging (Frank and Engelke 2001). Walking has also been found to be beneficial to mental health and wellbeing (Roe and Aspinall 2011). For children, active mobility includes walking, cycling and other modes of travel where physical activity is required such as by scooter (Pont et al 2009) where physical effort is required. Routine activities, such as the trip to and from school, provide children with the opportunity to be actively mobile and therefore can provide children with the recommended minimum 30 minutes of exercise associated with the positive health benefits of increased physical activity (Cooper et al 2005; McDonald 2007). In a UK study involving 200 school children Mackett et al (2005) found that walking to and from school each day in a week was the equivalent to two hours of structured physical exercise classes. Also children who walk to school are more likely to engage in other types of moderate to vigorous physical activity in school environments and as extracurricular activities (Mackett et al 2005; Timperio et al 2006). However, a decline in the active travel to school has been identified and this has implications for children's health through a drop in physical activity levels and associated increase in risk of obesity and risk to wellbeing (Mackett et al 2005).

Access

In addition to the health benefits made possible by the walk to school, children's ability to access other places to learn, to be active and to socialize may have an impact on their wellbeing. Places such as playgrounds, health centres, shopping centres, libraries, galleries and museums, swimming pools, and community gardens (Freeman and Tranter 2011, 115) facilitate learning, physical activity and social engagement through playful activities (Hart 1979; Barratt Hacking, Barratt and Scott 2007). Hart (2002) considers that the provision of urban, public space for play is important both for the development of children's physical, intellectual, social and emotional capabilities and for the building of a robust civil society. Children's ability to access to places within their local environments through walking and cycling can positively influence a broad range of social outcomes including enhancing the sense of safe, lively public places and social cohesion (Tranter and Pawson 2001; Witten, McCreanor and Kearns 2003; Roemmich et al 2007).

Independence

Walking can afford children independent mobility. It is the parents who determine the extent of their child's independent mobility, dictating spatial and temporal limits to their travel at particular ages – termed

the 'licence to travel'. Children who walk or cycle without adult accompaniment have been found to be more likely to spend a longer time being physically active and playing than those whose licences to travel independently have been restricted (Wen et al 2009). Children find walking independently empowering and even routine activities such as the walk to school can provide children with a sense of being independent and in control (Pooley et al 2010). Research also suggests that children who walk less and are less independently mobile may miss out on opportunities to make social connections, to develop a sense of civic responsibility and to exercise their basic right to access the public realm (Chawla 2002). Despite the importance of independent mobility, the rates of children's walking and cycling alone or in groups without adult accompaniment, in several countries have been shown to be declining (Hillman et al 1990; O'Brien et al 2000; Fyri et al 2011). Children are now more dependent on their parents than previous generations, acquiring labels such as being "bubble wrapped", the "back seat generation", and "battery reared" rather than "free range" (Karsten 2005; Malone 2007). The risks associated with restrictions on children's independent mobility may be derived from a number of sources including parent's anxieties, social norms and policy and regulatory responses (Rudner 2012).

Socio-ecological theory and children's mobility

Socio-ecological approaches provide a means to examine the concept of quality of life as it relates to into children's mobility. Socio-ecological theories conceptualise the individual as embedded within a number of different socio-spatial scales including the immediate activity setting; the household; the neighbourhood context; and the broader socio-cultural context (Bronfenbrenner 1979; Sallis et al 2006).

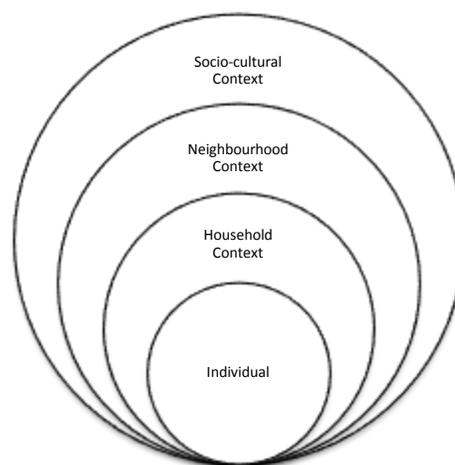


Figure 1: Socio-ecological model (adapted from Sallis et al 2006)

Socio-ecological models integrate the built environment, socio-cultural and institutional relationships that shape individuals' behavior (Sallis et al 2006). In doing so, they embody the potential influences on children's mobility. A detailed example of a socio-ecological approach is offered by Mitra (2012), who identified several influential domains on children's active and independent travel to school: the characteristics and attitudes of the individual children; household factors such as the influence of parental licences and scheduling of activities; the urban environment, including the built and social environment; and the broader policy and socio-cultural factors. Socio-ecological approaches are increasingly being used to understand complex relationships between people and their environments in order to plan and develop policy and strategies to improve their wellbeing. Giles-Corti et al (2005) identify the role of an ecological framework as providing a means to study complex interactions in order to predict behaviour and then design interventions to influence physical activity behaviour. Given the relevance and application of socio-ecological approaches to developing an understanding of complex socio-spatial relationships, there is a need to further examine how research designs can better utilize socio-ecological models. Earls and Carlson (2001) consider socio-ecological models as useful for encompassing both the distal contexts of neighbourhoods and the broader policy and socio-cultural contexts, as well as the

proximal relationships in households and school environments so important to children's wellbeing. Yet it is unclear how research approaches can encompass these influential contexts.

Study Design

A case study employing a number of research methods was used to test a preliminary approach with a view to adapting it for a national study involving a number of case studies. The case study school used in this research was a primary school in an inner-urban suburb of Perth, Western Australia situated approximately 12 kilometres from the Perth CBD. The school accommodates children between the ages of 6 and 12. The Western Australian state government has designated the school a local intake area school, meaning that priority is given to students residing within a specified boundary of at most 1.25 kilometres from the school (equivalent to around a 15 minute walk) (Education Department of Western Australia 2013). The built environment surrounding the school is characterized by low to medium residential density, typical of Western Australian suburbs that experienced rapid growth between the 1960s and 70s. Light industrial areas are located approximately one kilometre to the south and east of the school. The road network design is essentially a grid layout with some residential cells consisting of curvilinear road design.

Four methods were used to gain insight into the activity and context of children's everyday travel in relation to different socio-ecological scales. The four methods used were a children's survey; parent's survey; trip diary; and photo-collage exercise. The survey and the photo-collage exercise were conducted with 51 children. This sample was drawn from a total of 141 children available in years 5, 6 and 7 at the school. The children participating in the research were aged between nine and twelve years old representing the age that children begin to be independently mobile (Hillman 1990; O'Brien et al 2000). Participation in the survey, during June/July 2012, required parent and children's consent. A separate survey of their parents was also conducted. Table 1 provides a summary of the methods and analysis.

Table 1: Description of Research Methods and Analysis

Method	Description and Administration	Analysis
Children's Survey	The survey contained questions relating to children's perceptions of safety (both from traffic and fear of crime); accessibility (the provision of interesting places to access and means to get to them); and walkability (the provision of suitable infrastructure). The children's survey was administered to the children in class by the researchers during a visit to the case study school.	Descriptive analysis was conducted using <i>SPSS version 21</i> .
Children's travel diary	Children were asked to fill out a travel diary for four days (two weekdays and Saturday and Sunday). The travel diaries captured the origin and destination of trips; travel mode; travel purpose; and whether the child was accompanied, either by an adult or other children.	As above
Parent's Survey	A survey was conducted of parents of each of the children who participated in the children's survey. The intent of the survey was to gather insight into the attitudes and perceptions of parents in regards to their children's travel behaviour and the licences granted to children to be independent mobile. Surveys were distributed in class and the children were asked to take them home to their parents to fill out and return.	As above.
Photo-collage	Children were given disposable cameras and asked to take photographs of what they liked and hated about their neighbourhood. After collecting the cameras, developing	The photographs and collages were scanned and inputted into <i>Hyper-research Version</i>

	the photographs and returning them to the children, a photo-collage exercise was conducted in class. The children were asked to construct three collages using their photographs and drawing. Three themes of collages were used entitled: "What I love about my neighbourhood"; "What I hate about my neighbourhood"; and "What I think my perfect neighbourhood is especially if I was exploring it without any adults".	3.5.2 for analysis. The program allowed each image within the collages to be assigned codes or multiple codes. An open-coding process was derived from Boyatzis' (1998) work on thematic coding and analysis.
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This study draws on data collected in a national research project funded by the Australian Research Council Discovery grants - 'CATCH, Children's Active Travel Connectedness and Health'. The objective of the CATCH project is to examine how factors of the social and built environment influence the independent mobility, active travel and health of Australian children across a range of environments that broadly represent where the majority of children reside in contemporary Australian society. The CATCH study employs a multi-disciplinary and multi-methodological approach, focusing on nine case studies across four urban and regional Australian centres. This paper reports on the preliminary analysis of one case study, in Perth, Western Australia. The purpose of the paper is to explore potential avenues of investigation for a national context regarding the link between children's quality of life, walking and the built environment.

Findings

As noted above, research has highlighted the potential for the walk to school to enable children to achieve recommended physical activity levels. The mode choice of children in the walk to school can be seen as an indication of the amount of physical activity children engage in through walking. The surveys contained questions regarding how children usually travelled to school (illustrated in Table 2).

Table 2: Children's reported usual travel mode to school (n=51)

		Active Travel to School		Non-active travel to school		Total
Gender	Boy	N 8	42%	N 11	58%	N 19
	Girl	N 12	37.5%	N 20	62.5%	N 32
	Total	N 20	39%	N 32	61%	N 51
Age	< 10 years	N 10	37%	N 17	63%	N 27
	10 years	N 9	52%	N 8	48%	N 17
	11 years	N 1	16%	N 5	84%	N 6
	12 years	na	na	na	na	N 1
	Total	20	39%	31	61%	N 51

Less than half the children (39%) were usually active travelers to school (NB. Active travel modes include walking, cycling, and scootering. Non-Active modes of travel include travel as a car passenger). Unusually, when compared to the younger children a higher percentage of children of 11 years of age were not usually active travelers, although it should be noted that the low number of respondents limits the validity of the data. Information about the participating children's travel has also been obtained from their travel diaries for all trips made during the course of four days (from Friday through to Monday). Of the 580 total trips (both non-home and home based trips) made by these children only 19% were made by active modes (14.5% walking; 4.5% cycling). Table 3 illustrates that the majority of non-home based walk trips were to school or to the park/playground.

Table 3: Children's non-home based trip purposes and mode of travel (n= 250 trips over a 4 day period)

Journey purpose	Walk trips (%)	Cycle trips (%)	Car trips (%)	No. trips by purpose
School	52	25	38	100
Park/ Playground	24	33	4	24
Shopping	6	33	38	78
Visit family/ friends	18	0	20	47
Go for a bike ride	N/A	9	N/A	1
Total trips	49 (20%)	12 (5%)	189 (76%)	250

Children were asked in the children's survey to record how they usually travelled to a number of activities potentially within the local neighbourhood. This data provided an overview of usual activity patterns not necessarily picked up in the travel diary, which provides only a snapshot over one four-day period. Access by walking was most apparent in trips to parks. On the other hand over 60% of children reported that they were usually driven to the local shops and friend's houses. 86% of children were usually driven to organised activities, such as sports or recreational hobbies. Over half the total trips taken to organised activities were made by car, with the duration of trips between 5 -15 minutes. 14% of trips took longer than 16 minutes by car, whilst the remainder of trips was within 5 minutes travel by walking, cycling or driving.

Table 4: Children's reported usual travel mode to activities (n=51)

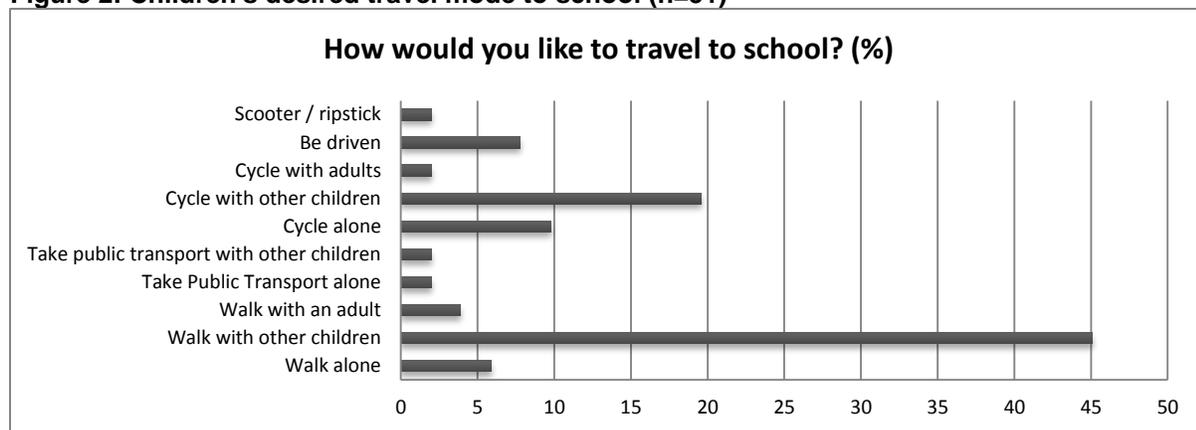
	Walk alone	Walk with other children	Walk with adult	Public Transport alone	Bicycle alone	Bicycle with other children	Bicycle with an adult	Be driven	Don't go here
How do you usually travel to the local shops?	9.8	13.7	3.9	0.0	6	0.0	2.0	62.7	0.0
How do you usually travel to the local friend's house?	15.7	0	2	2	2	2	0	72.5	3.9
How do you usually travel to the local parks?	22.9	29.2	16.7	0	0	10.4	13.7	14.6	2.1
How do you usually travel to organised activities?	2	0	2	0	2	0	0	85.7	8.2

Data relating to children's actual behavior provides only limited insight into wellbeing. As noted above physical activity provides children with important physical and mental health benefits. Active travel is one way that children's physical activity needs may be met. However, that the surveys revealed that less than half the children reported they usually walked or cycled to school and that the travel diaries showed that only a very small percentage of trips were taken by active modes of travel, may not necessarily mean the children are not engaging in the recommended physical activities. Children are increasingly engaging in physical activity through participation in a diverse range of extra-curricular activities (Wright, MacDonald and Groom 2003). In the photo-collages children identified organised social sporting pursuits as an important activity; one that most children reported positively. Recreational and organised activities such

as team sports, hobbies and play were a prominent theme identified in the children’s photo-collages. The children frequently included places such as sporting grounds, football ovals, recreation centres and tennis, netball and basketball courts in the collages themed as ‘Perfect’ or ‘Love’ collages. Children’s travel to organized activities is disproportionately represented by car trips as demonstrated in the survey findings.

The surveys and travel diaries provided an indication of the places children access in the neighbourhood and the mode of travel to those places. As children’s wellbeing can be gauged by whether their preferences are satisfied, the children were asked how they would like to usually travel to school and these results are illustrated in Figure 2.

Figure 2: Children's desired travel mode to school (n=51)



The children demonstrated a preference for walking and cycling to school without adult accompaniment. Walking to school with other children was identified as the most popular preferred way of travelling to school, supporting findings that children identify the opportunity for social interaction during walking to school as one of the main reasons they prefer to walk to school (Wood et al 2010). Almost one fifth noted that they would like to cycle to school with other children. 17.7% of children indicated that they would like to travel alone either by walking, cycling or public transport. Overall, 88.2% of children reported that they would like to travel to school by an active mode of transport. The discrepancy between children’s actual travel, as demonstrated in the survey and trip diary data, and their preferred mode of travel gives provides a stronger indication that children’s wellbeing is not being met through their existing mobility patterns.

By allowing children to take their own images of the local neighbourhood and arrange them in a way that revealed what they liked, hated and what they thought was their ideal neighbourhood, additional insight into what mobility affords children was provided. For example, several children highlighted in the photo-collages that the proximity of places was important to them. One child’s Love collage was comprised mostly of comments relating to proximity: “I am close to most of my friends and the park”; “I am close to the school”; and “We are near the petrol station”. In other children’s collages places also featured in regards to their proximity. One child included a photograph of the local library and noted: “This is the library. It is close to my house which is good”. Another child noted in a Perfect collage: “I wish the duck pond was right next to my house then I could take my dogs there, they love it.” Places’ proximity to each other was also a theme, in addition to the proximity of places to the child’s home. One child noted in their Perfect collage that “there is a recreation centre nearby” to the park. This particular park was cited as a place that children love to be living in close proximity to. One child noted “I love my neighbourhood because it is close to school and [the park]... about 300 metres”. Access to these places and what these places afford children is clearly valued. However, it is not clear how walking relates to each of these places and activities. Proximity may be desired in relation to car travel to these places. Figure 3 and Figure 4 show examples of the representations of proximity in the photocollages.



Figure 3: Example from a Love photocollage-
"This is the library it is close to my house which is good".



Figure 4: Example from a Love photocollage-
"This is xxx park it is close to my house and school, it is very fun".

Understanding the relationship between children’s mobility and wellbeing can also be considered from a capability perspective. A capabilities approach considers satisfactions and happiness in relation to individual’s capacity or freedom to act and their aspirations. In light of this, parents were asked a series of questions regarding the licences they grant to their children to be independently mobile. Roughly two thirds of the parents allowed their children to travel to (69%) and from (65%) school without an adult present (Table 5), whilst 47% of parents allowed their children to cross main roads without adults present. Only a fifth of respondents allowed their children to cycle on main roads without an adult present. A very small percentage (2%) allowed their children to catch public transport without adults.

Table 5: Children Licences to Travel- Parent's Responses (n=51)

	Yes	No
Is your child allowed to travel TO school without an adult present?	69%	31%
Is your child allowed to travel FROM school without an adult present?	65%	35%
Is your child allowed to cross main roads without an adult present?	47%	53%
Is your child allowed to cycle on main roads without an adult?	20%	80%
Is your child allowed to travel on buses, trams trains or other public transport without an adult present (other than a school bus)?	2%	98%

Parents were also asked to indicate how far their children were allowed to travel from their homes both on their own and also with friends and siblings (Figure 5: Children’s Range of Independent Travel Reported by Parents (n=51))

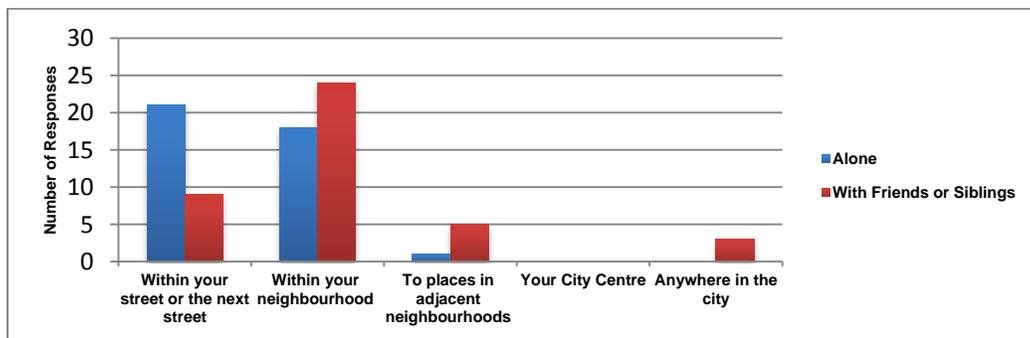


Figure 5: Children’s Range of Independent Travel Reported by Parents (n=51)

The majority of children had their independent travel spatially restricted – most of those allowed out alone were restricted to their immediate streets or within a 1km of their home. Independent travel, without any

accompaniment, was not allowed outside the neighbourhood. A greater level of independence from adult accompaniment was allowed when children walked with friends or their siblings. Some parents reported that the range of travel extended for their children beyond the immediate neighbourhood environment when their children were accompanied with friends or siblings. Overall the survey indicates that the majority of children in the case study had some degree of potential freedom in the neighbourhood area immediate to their household and that this freedom was extended when accompanied by other children. The travel diaries showed that the level of accompaniment of children's trips was very high with 86% of all trips being undertaken with an adult present, 14% with other children and only 7% by the child on their own (n= 558). This low level of independent mobility is borne out by the high proportion of trips being undertaken by car (76%), with only 20% of trips being undertaken by walking (see Table 3). The discrepancy between children's licences to travel unaccompanied and the actual rate of unaccompanied travel, provides a more nuanced reading of children's wellbeing in relation to their mobility; one that suggests that, despite the apparent freedom to travel independently and that this is the preferred mode of travel for children, accompanied travel by motorized vehicle is still the predominant mode of travel.

Discussion

This paper presents an initial exploration into the issue of children's active and independent travel when different conceptualizations of wellbeing are highlighted. A socio-ecological approach allows research into the multi-scalar influences (individual/ household/ built environment/ policy/ social) on children's walking and active mobility. The range of the methods reported on here provide an understanding of individual children's travel behaviour; children's and parent's perceptions and evaluations of the neighbourhood; and the licences children are granted to travel. However, there is potential for the socio-ecological approach to enable further insight into the relationship between children's mobility and their wellbeing.

The findings suggest that conceptualizing wellbeing in different ways may contribute to a broader understanding of the relationship between children's active travel and the urban environment. Given the current traction of the role of planning in designing healthy cities, it is worth noting that children's physical activity (sporting and organized physical activity) was associated with car travel, as well as with walking and cycling. From a needs perspective, achieving recommended rates of physical activity associated with better health for children could occur within a car-based travel paradigm. The walk to school has important health benefits, but what may be more needed is a broader consideration of what constitutes health and wellbeing. From a utilitarian perspective, walking and cycling were clearly valued by the children, evident in their stated preference for active modes of travel to school and the positive representation of walking in the children's photocollages. The participating children also valued being close to places and activities. They wanted access to activities and they saw walking and cycling, particularly with other children, as the preferred way of getting there.

When approaching children's active travel from a capability approach, one that evaluates the subjective wellbeing of children in relation to their agency to access resources that afford wellbeing, the provision of physically accessible places may not be enough. Although children's independent mobility was valued in the study by many of the parents, there was a discrepancy between the number who allowed their children to walk or cycle without adult accompaniment and the level of independence exhibited in their children's usual travel patterns. Insight provided by the travel diaries indicates that only in a small number of cases was children's travel independent from adult supervision. One explanation contributing to the discrepancy may be that parent's attitudes are held within a broader socio-cultural context; one that often represents children as incapable of behaving 'normally' in street environments. Drawing on Kytta's theory of children's types of independent mobility (2004) the study showed that the freedom for children to be independently mobile, although not always constrained by licences to travel, was not actualized despite parents considering that their children can be capable independently mobile. Barriers may be presented in both the physical environment, made evident in the children's focus on the importance of accessible paths and road crossings; and the social discourse surrounding children's capacity to act normally and responsibly within the urban environment.

The implication for planners concerned with issues of children's mobility is that there should be a consideration of the different ways that wellbeing can be conceptualized, and an understanding of how issues relevant to children's wellbeing become manifest in urban environments. Knowledge of both the

built and social environmental influences shaping children's travel patterns is important. In this regard, a socio-ecological approach provides much potential. The methods utilized in this study provide some insight into the individual level factors (attitudes, perceptions and meaning); household factors (licenses to travel and household travel activity); and neighbourhood factors (places and activities). Whereas the photcollage provided important insight into children's experience and meanings associated with their mobility environments, there is more scope for qualitative insight. Knowledge of the broader socio-cultural scale influences relating to social norms and expectations can aid an understanding of the rules and licences imposed on children's mobility. How these influences are manifest at the individual, household and neighbourhood scales is important to planners developing strategies to facilitate children's active and independent mobility.

Conclusion

This paper presents the initial findings of one case study within a large national research project. The authors acknowledge the limited scope for the generalization from these research findings. However, the early analysis of the multiple perspectives offered by the case study indicates that there may be a need for a broader approach to the relationship between active travel and quality of life, in order to guide policy making and planning for increasing children's walking - one that is not based on purely subjective means / objective means but a consideration of the two approaches. An approach that takes into account children's aspirations and freedom to achieve their aspirations, not just about walking but about what walking affords- health, access and independence.

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