



Social and built-environment factors related to children's independent mobility: The importance of neighbourhood cohesion and connectedness



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ABSTRACT

This study examines aspects of neighbourhood social environments (namely, neighbourhood safety, cohesion and connection) and child-specific built environment attributes in relation to children's independent mobility. The results suggest that children aged 8–13 years with parents who perceive their neighbourhood as more cohesive and more connected, and are located closer to school, engaged in higher levels of independently mobile trips. The qualitative component of this research revealed that for NZ European, Māori, Samoan and other Pacific parents, 'people danger' was the most common concern for letting their children go out alone, whereas for Asian and Indian parents, 'traffic danger' was the most common reason for their concern.

1. Introduction

Independent mobility (travelling and playing outside the home environment without adult accompaniment) is important for physical, social and cognitive development in children. Independent mobility can contribute to physical activity accumulation (Oliver et al., 2016; Schoeppe et al., 2014) and children learn through autonomous interaction with their surroundings (Morrow, 2003). Experiences of people and place contribute to self-identity, security, and social competency (Proshansky and Gottlieb, 1989).

Despite these widely acknowledged benefits of independent mobility for children's health and wellbeing, this behaviour has declined substantially across most developed countries over recent decades (Fyhri et al., 2011; Shaw et al., 2015; Witten et al., 2013). In New Zealand, the average time per week children spend in active travel (e.g. walking or cycling) has almost halved from a mean of 130–72 min per week over the past 20 years, while the numbers of children who usually travel to school by car has almost doubled (Ministry of Transport, 2012, 2015). While independent mobility was not assessed in these national surveys, the reduced prevalence of active travel suggests a concurrent reduction in opportunities for independent travel. Other studies have shown that children were less likely to travel unsupervised through neighbourhood environments and to local destinations such as parks, during their leisure time when compared with previous generations (Karsten, 2005; Witten et al., 2013).

A number of explanations have been put forward for the decrease in children's independent mobility. Qualitative research has consistently documented parental safety concerns as largely explaining reductions in children's independent mobility (Jago et al., 2009; Veitch et al., 2006). Safety-conscious parenting practices have become commonplace in many countries (Karsten, 2005; Fyhri et al., 2011; Mackett et al., 2007). Children are chauffeured between home, school and other local destinations and many are supervised at all times while playing outside. Media reports of children being harmed or abducted by strangers are seen as fueling parents' perceptions of safety and a belief that children are vulnerable in the public realm (O'Connor and Brown, 2013; Valentine and McKendrick, 1997). Quantitative studies investigating this relationship, however, have produced mixed findings, with some studies found significant relationship between parental safety concerns and children's active travel and/or independent mobility while other studies revealed no such relationship (Carver et al., 2005, 2008a; Foster et al., 2014; Janssen et al., 2016; Mammen et al., 2012; Mitra et al., 2014; Timperio et al., 2006, 2004). To some degree, these differences may be due to inconsistencies in the definition and measurement of independent mobility (Chaudhury et al., 2015). Independent mobility has predominantly been classified using parent reports of the licence they provide to their child to be independent in the neighbourhood. To a lesser extent, independent or roaming "range" and child reports of accompaniment during travel and play behaviours have more recently been used (Foster et al., 2014; Oliver et al., 2015).

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Mixed method approaches and measurement of actual independent behaviours are needed to shed some light on these discrepancies and develop further understandings of the associations between parents' perception of safety and children's independent mobility.

Besides parents' perceptions of safety, other aspects of neighbourhood social environments have rarely been investigated in relation to children's independent mobility. In adult research, neighbourhood social cohesion has been shown to protect individuals against real and perceived dangers (De Jesus et al., 2010; Foster et al., 2010; Kawachi et al., 1999; Sampson et al., 1997; Sampson and Raudenbush, 1999) and to influence health-related behaviours, including levels of physical activity (Cradock et al., 2009; Franzini et al., 2009; Lin et al., 2012). However, no studies (to the authors' knowledge) have investigated the associations between neighbourhood social cohesion and children's independent mobility. Neighbourhood social cohesion is conceptualised as the degree of trust, familiarity, and mutual support that exists among people living within defined geographic boundaries (Carpiano, 2006; Sampson et al., 1997). We hypothesized that parents who perceived their neighbourhoods as more cohesive would allow their children to engage in more independently mobile trips.

The level of neighbourhood social connections is also a factor of relevance, as it provides casual monitoring and benign surveillance of local children's outdoor activities (Carver et al., 2008b; Witten et al., 2013). Different from social cohesion (which is about the degree of trust and familiarity that exists among people living in defined geographic boundaries), social connection is about the degree of connections between the adults and children living in the same neighbourhood. This same concept has been termed 'intergenerational closure' by some scholars (Sampson et al., 1999), as it was looking into the intergenerational (i.e., adult-children) connections and closeness within a community. It has been proposed that when parents know the parents of their children's friends, they can observe the child's actions in different circumstances, talk with other parents about their child, and establish norms (Coleman, 1990; Sampson et al., 1999). Such structural and normative adult-child connections give children social support, provide parents with information, and facilitate informal social control (Sampson et al., 1999). To date, the associations between neighbourhood social connections and children's independent mobility have not been investigated. We hypothesized that the availability of a network of parents who know each other and who are willing to watch out for neighbourhood children could lessen parents' fears for children's safety in the public realm and increase parents' willingness to let their children travel through, play in, and explore their neighbourhood independently.

An emerging literature has examined the effects of neighbourhood built environments on children's independent mobility (Ding et al., 2011). It seems that low dwelling density, poor street connectivity and poor land use mix – factors that affect physical activity levels negatively in adults (Sallis et al., 2012) – may influence children's activity levels in the same way (Ding et al., 2011). Evidence is convincing that shorter distance to school is associated with increased likelihood of active travel to school (Oliver et al., 2014; Nelson et al., 2008; Trapp et al., 2012) but findings are more equivocal on the impact of street connectivity and traffic volumes. An Australian study examining the built environment around schools, which included a measure of traffic exposure, showed higher street connectivity was associated with more walking to school, but only where traffic volumes were low (Giles-Corti et al., 2011). Studies of children's physical activity and independent mobility for behaviours and journeys other than the trip to school are still relatively rare. Positive associations between dwelling density and/or street connectivity and out-of-school physical activity or independent mobility have been found in some studies (de Vries et al., 2007; Villanueva et al., 2012) and negative associations (or no associations) in others (Mecredy et al., 2011; Mitra et al., 2014; Oliver et al., 2015). Further work is needed to clarify these relationships; in addition, using

measures that are relevant to children (such as the child-specific neighbourhood destination accessibility index (NDAI-C) (Badland et al., 2015)) will enhance our understanding in this area.

Opportunities exist to develop more in-depth understandings of associates of children's independent mobility. In particular, gaps exist with regard to neighbourhood cohesion, neighbourhood social connection, a need to employ population-specific measures of the objective built environment, and measuring actual independent behaviours (as opposed to licence for independence). The current study aims to address these research needs, by investigating parent perceptions of their social neighbourhood environment, employing child-specific measures of the built environment (the NDAI-C), and a mixed method approach using qualitative and quantitative methods.

2. Methodology

2.1. Context

Kids in the City (KITC) was a mixed-method study exploring children's use and experiences of their neighbourhood. We considered neighbourhood as the immediate street around the home. Data collected enable associations between built environment features, parents' neighbourhood perceptions and children's independent mobility, active transport, physical activity, and body size to be examined. Design and methods of the full study are described in detail elsewhere (Oliver et al., 2011; Carroll et al., 2015).

In brief, data were collected between 2011 and 2012 from children aged 8–13 years who attended one of nine schools in Auckland, New Zealand. Experiential data were collected from children during neighbourhood walking interviews and schools-based focus group discussions; and quantitative data on their mobility and physical activity were gathered using travel diaries, geographic positioning systems and accelerometers. Parents/caregivers were also interviewed by telephone and in focus groups. The physical neighbourhood environment was assessed using observational audits and geographic information systems derived variables around children's residential addresses. This study draws on data from telephone surveys with parents/caregivers, children's travel diaries, and built environment measures. The aim is to explore the extent to which family characteristics, parental perceptions, and built environment characteristics are associated with children's independent mobility.

2.2. Data collection

Children were asked to complete a travel diary over a seven-day period. Researchers met with children on each school day of the study period to check that destination, mode of travel, and accompaniment status were adequately recorded in the travel diary for that morning and previous evening (or weekend if on a Monday).

Parents were telephoned at the completion of data collection in schools and a 75 item computer-aided telephone interview (CATI) was administered by a trained interviewer. The survey drew from existing questionnaires and included child, parent, and household demographics; perceptions of neighbourhood physical and social environments; children's mode and accompaniment of travel to and from school, and independent mobility to other settings (Oliver et al., 2011). CATI interviews lasted between 20–30 min, and were conducted in the parent's language preference of English, Samoan, Tongan, Chinese, or Korean.

2.3. Children's independent mobility measure

Travel diary data were used to collect data on trip origin, destination, time, travel mode (car, walk, bus etc.), and accompaniment (alone, with friends, with parents, etc.). The diaries covered the time

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