



## Individual, family, and neighborhood correlates of independent mobility among 7 to 11-year-olds

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### ABSTRACT

**Objective.** Independent mobility refers to the freedom that children have to move around their neighborhood without adult supervision. It is related to their physical activity and health. We examined the intrapersonal, family, and neighborhood correlates of independent mobility within children. **Methods.** 497 American parents of 6.9–11.9 year olds completed a survey (November, 2014) that assessed their child's independent mobility range, several intrapersonal characteristics of their child (gender, age, race, etc.), several characteristics of their family (family structure, socioeconomic status, parental physical activity, etc.), and their perceptions of the safety of their neighborhood (18 questions reduced to 4 components). Associations were determined using ordinal logistic regression. **Results.** Children's age, parent's perception that their neighborhood is safe for children, and parent's fear of neighborhood crime were the independent correlates of independent mobility. Compared to 6.9–7.9 year olds, the odds ratio (95% CI) for increasing independent mobility were 2.31 (1.47–3.64) in 8.0–9.9 year olds and 3.38 (2.13–5.36) in 10.0–11.9 year olds. Compared to children whose parents who did not perceive that their neighborhood was safe for children, the odds ratio for increasing independent mobility was 4.24 (2.68–6.70) for children whose parents perceived their neighborhood was safe for children. Compared to children whose parents had the lowest fear of neighborhood crime, the odds ratio for increasing independent mobility was 0.41 (0.27–0.62) for children whose parents had the highest fear of crime. **Conclusions.** Children's independent mobility was associated with their age, their parent's perception that their neighborhood was safe for children, and their parent's fear of crime.

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### Introduction

Independent mobility refers to the freedom that children have to move around their neighborhood without adult supervision. Independent mobility influences several behavioral and health outcomes. Specifically, children's independent mobility is positively related to their active outdoor play and active transportation (Mackett et al., 2007; Page et al., 2010; Prezza et al., 2011). Children with a greater independent mobility have better social skills and stronger bonds with their peers and community (Joshi et al., 1999; Malone and Rudner, 2011; Prezza et al., 2011). They are also better equipped to navigate and interact with the physical environment (Bixler et al., 2002; Rissotto and Tonucci, 2002). Providing children with the freedom to move around their neighborhood can help build their confidence and self-esteem (Hillman et al., 1990; Joshi et al., 1999).

Present-day children have a more confined independent mobility range than children of previous generations (Fyhri et al., 2011). Recent Australian data indicate that 32% of 8–12 year olds are not allowed to roam more than 100 m from their home without an adult, and that 64% are not allowed to roam more than 1 km from their home (Veitch et al., 2008). The limited independent mobility range of most children may be contributing to the low physical activity levels in the pediatric population.

Ecological models are commonly used in physical activity behavior research (Sallis et al., 2006). These models postulate that physical activity is influenced by factors at multiple levels including intrapersonal (e.g., age, gender, cultural beliefs), interpersonal (e.g., relationships and characteristics of family), and neighborhood levels (e.g., social conditions, built environment) (Stokols, 1992). Ecological models also provide a framework to study the factors that influence independent mobility. Although information is limited, there is some evidence that boys have a greater independent mobility than girls (Brockman et al., 2011; Foster et al., 2014), that independent mobility increases as children get older (Veitch et al., 2008), and that parent's perceptions of neighborhood traffic safety and stranger danger (Foster et al., 2014; Santos et al., 2013) correlate with their children's independent mobility. Although the correlates of independent mobility occur at multiple

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ecological levels, existing studies have not simultaneously considered multiple correlates at the various levels.

Therefore, the purpose of this study was to examine the correlates of independent mobility within children. We examined several correlates at the intrapersonal, interpersonal/family, and neighborhood levels. Such research could help identify the strongest correlates of independent mobility, which in the short term may be identified for more focused study, and in the long-term may be addressed via interventions. Although our choices of potential correlates to study were governed by existing literature, this study was exploratory and no a priori hypotheses were assumed.

**Methods**

*Study design and participants*

The study received ethics approval from the Queen’s University General Research Ethics Board. This was a cross-sectional study of children born from 2002–2007 and aged 6.9–11.9 years at the time of participation. All data were obtained by parent/guardian (hereafter referred to as parents) proxy report and were collected on November 24, 2014. Parents were recruited from the CINT panel, a heterogeneous group of adults from over 60 countries who participate in a variety of web-based surveys. Aside from being the parent of a child born between 2002 and 2007, the only other inclusion criteria were residing in the United States and ability to complete the survey in English. A total of 1310 panel members met these criteria. Only a single panelist from any given internet protocol (IP) address was allowed to complete the survey. If the parent had more than one child in the age group of interest, the parent completed the survey based on the oldest child. After reading the letter of information and providing consent, the survey was administered using FluidSurvey™ online survey software. A total of 560 parents started the survey and 515 completed it. Eighteen responded “prefer not to say” to one or more question and were removed from the analyses. Thus, the final sample size used here was 497. The majority of parents completing the survey were female (74%) and a biological parent (92%) of the child. There was at least one participant from each state with the exception of Hawaii, New Hampshire, New Mexico, and North Dakota. The urban/rural distribution of the sample is shown in Table 1. Because the online survey was closed shortly after the targeted number (N = 500) of CINT panelists completed the survey, which occurred approximately 24 h after the survey was launched and email invitations were distributed to eligible panelists, the response rate among panelists who were initially invited to participate cannot be determined.

*Independent mobility*

The independent mobility range of the children was measured by asking their parents the following questions (Veitch et al., 2014): “How far is your child allowed to roam on his or her own without adult accompaniment?” and “How far is your child allowed to roam with friends, but without adult accompaniment?” Response options to these questions were: “My child is not allowed out alone”, “My child is allowed out within my yard and/or driveway”, “My child is allowed out within my street”, “within 2–3 streets from home”, “within a 15 minute walk from home”, and “more than a 15 minute walk from home”. The last two response options were combined for the analyses due to the low number of responses for the last option (3%). Responses to the two independent mobility questions were merged, with the highest response being kept. It has previously been shown that the test–retest reliability for these two independent mobility questions is modest (K = 0.59 and 0.52) (Veitch et al., 2014). It is noteworthy that responses to the two independent mobility questions were the same in most instances in our study, and the correlates of independent

**Table 1**  
Descriptive characteristics of study sample

| Characteristic                  | N   | %    |
|---------------------------------|-----|------|
| Gender of child                 |     |      |
| Male                            | 245 | 49.3 |
| Female                          | 252 | 50.7 |
| Age of child                    |     |      |
| 6.9–7.9 years                   | 97  | 19.5 |
| 8.0–9.9 years                   | 202 | 40.6 |
| 10.0–11.9 years                 | 198 | 39.8 |
| Race of child                   |     |      |
| White                           | 344 | 69.2 |
| Non-white (including mixed)     | 153 | 30.8 |
| Activity limitations of child   |     |      |
| No                              | 413 | 83.1 |
| Yes                             | 84  | 16.9 |
| Number of siblings in household |     |      |
| 0                               | 123 | 24.8 |
| 1                               | 201 | 40.4 |
| ≥2                              | 173 | 34.8 |
| Number of parents in household  |     |      |
| Dual                            | 405 | 81.5 |
| Single                          | 92  | 18.5 |
| Parent education                |     |      |
| High school or less             | 114 | 22.9 |
| 2-year college                  | 125 | 25.2 |
| 4-year college/university       | 187 | 37.6 |
| Graduate university             | 71  | 14.3 |
| Annual household income         |     |      |
| <\$25,000                       | 61  | 12.3 |
| \$25,000–\$50,000               | 118 | 23.7 |
| \$50,001–\$75,000               | 105 | 21.1 |
| \$75,001–\$100,000              | 115 | 23.1 |
| >\$100,000                      | 98  | 19.7 |
| Population size of municipality |     |      |
| <10,000 people                  | 116 | 23.3 |
| 10,000–99,999 people            | 134 | 27.0 |
| 100,000–499,999 people          | 126 | 25.4 |
| ≥500,000 people                 | 121 | 24.4 |

mobility were identical irrespective of whether the highest response or average response from the two questions was used.

*Intrapersonal correlates*

*Demographics*

The children’s gender, age (6.9–7.9 years, 8.0–9.9 years, 10.0–11.9 years), and race (white and non-white including mixed race) were considered.

*Activity limitations*

Parents were asked whether a physical condition or health problem reduced the amount or kind of physical activity their child could do. Responses were used to create “yes” and “no” groups.

*Family correlates*

*Sociodemographics*

A number of sociodemographic variables were considered: dual vs. single parent household, number of siblings in the household (0, 1, 2 or more), annual household income (< \$25,000, \$25,000–\$50,000, \$50,001–\$75,000, \$75,001–100,000, >\$100,000), and highest completed education of the parent completing the survey (high school or less, 2-year college, 4-year college/university, graduate school).

*Parent physical activity*

Using a 5-point scale that ranged from “strongly agree” to “strongly disagree”, parents were asked to what extent they agreed with the following statements: “I enjoy physical activity”, “I am physically active on a regular basis”, and “I attempt to set an example for my child by being physically active”. These questions are from The Activity Support

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