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Adolescents' perceptions of cycling versus walking to school: Understanding the New Zealand context

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ABSTRACT

Background: Cycling to school is less common than walking in many developed countries. This cross-sectional study compared correlates and perceptions of walking versus cycling to school in Dunedin adolescents living ≤ 4 km from school.
Methods: Adolescents (n = 764; 44.6% males; 15.2 ± 1.4 years) from 12 secondary schools completed an online survey about perceptions of walking and cycling to school. Distance to school was calculated using Geographic Information Systems network analysis.
Results: Overall, 50.8% of adolescents walked and 2.1% cycled to school, 44.1% liked cycling for recreation and 58.8% were capable/able/confident to cycle to school. Adolescents expressed more positive experiential (walking: 45.9%; cycling: 34.9%) and instrumental beliefs (walking: 74.2%; cycling: 59.2%) towards walking versus cycling to school ($p < 0.001$). Compared to walking, adolescents reported that cycling to school was perceived as less safe by themselves (cycling vs walking; 61.3% vs 89.8%) and their parents (71.4% vs 88.6%) and was less encouraged by their parents (23.0% vs 67.0%), peers (18.8% vs 48.4%) and schools (19.5% vs 30.8%) (all $p < 0.001$). The route to school had fewer cycle paths compared to footpaths (37.2% vs 91.0%; $p < 0.001$). Cycle friendly uniforms (41.4%), safer bicycle storage at school (40.1%), slower traffic (36.4%), bus bicycle racks (26.2%) and bicycle ownership (32.7%) would encourage cycling to school.
Conclusions: Compared to walking, cycling to school among Dunedin adolescents was less common, perceived as less safe and had less social and infrastructure support. Future interventions should focus on creating supportive physical and social environments, and improving road safety for cyclists in New Zealand.

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1. Introduction

Public health goals of increased physical activity and societal interest in alternatives to automobile transportation place a focus on active modes of transport such as walking and cycling. In addition, the need to transition away from motorised transport, particularly the private car, has been publicized as an important way to reduce transport-related greenhouse gas emissions (Sims et al., 2014). Transport mode choice is one of the most environmentally-significant decisions made by individuals (Collins and Chambers, 2005), and addressing high-carbon personal transport represents a key opportunity to mitigate climate change.

Though walking is a popular form of active transport to school, cycling to school is less common among adolescents in many developed countries including United States (McDonald, 2007), Canada (Larsen et al., 2009), Spain (Chillon et al., 2009), Ireland (Murtagh et al., 2016), Australia (Leslie et al., 2010) and New Zealand (Mandic et al., 2015). In contrast, countries with long cycling traditions, comprehensive cycling-friendly infrastructure and flat landscape such as Belgium (Van Dyck et al., 2010) and Denmark (Cooper et al., 2006) have higher rates of cycling versus walking to school among adolescents. In New Zealand, rates of walking to school in adolescents have remained relatively stable (26% in 1989/1990; 28% in 2010–2014) while the rates of cycling to secondary school have declined from 19% in 1989/1990 to 3% in 2010–2014 (Ministry of Transport, 2015).

Correlates of active transport to school in children and adolescents include demographic characteristics, individual and family factors, school factors, and social and physical environmental factors (Davison et al., 2008; Panter et al., 2008; Pont et al., 2009; Wong et al., 2011) Most previous studies either examined perceived barriers to walking and cycling to school together or focused on walking (Lu et al., 2014). Walking and cycling are different behaviours with distinct characteristics (Krizek et al., 2009) and therefore correlates of those behaviours are also likely to differ (Lu et al., 2014; Schlossberg et al., 2006). Compared to walking, cycling is faster, covers greater distances, requires more physical skills, demands more specific built environment characteristics, and has more prominent traffic safety concerns (Krizek et al., 2009). In addition, built environment characteristics that predict walking to school in children may not predict cycling (Schlossberg et al., 2006). For children, cycling to school is positively associated with high levels of independent mobility (Ducheyne et al., 2012), preference to cycle (Trapp et al., 2011), parental confidence in their child's cycling skills (Ducheyne et al., 2012; Trapp et al., 2011), peer and parental support (Ducheyne et al., 2012), and neighbourhood traffic safety (Ducheyne et al., 2012), and negatively associated with perceived convenience of driving children to school (Trapp et al., 2011).

Low rates of cycling to school reported in New Zealand adolescents (Mandic et al., 2015; Ministry of Transport, 2015) may be context-specific and related to the local cycling culture, social norms, non-supportive physical environments and the weather. The city of Dunedin (population: 130,000) is located on the South Island of New Zealand, has a maritime climate with cool and wet weather and diverse topographical landscape with the city centre being surrounded by hills. Coupled with New Zealand's high rates of bicycle-related accidents in adolescents (Tin et al., 2010), nation-wide high rates of private vehicle ownership per capita (The World Bank, 2014), school uniform requirements and lack of school enrolment schemes in Dunedin, these characteristics represent a challenge for promoting active transport to school, and particularly cycling, in this city. Previous studies in adolescents highlighted the importance of social support for active transport (Leslie et al., 2010; Carver et al., 2010) and specifically for cycling (Ducheyne et al., 2012) to school, with a distance of up to 4 km (2.5 miles) being reasonable for adolescents' cycling to school (Nelson et al., 2008). Therefore, this cross-sectional study compared perceptions of walking versus cycling to school drawing from the theory of planned behaviour and additional individual, environmental and safety factors among adolescents from Dunedin who lived within 4 km from school.

2. Materials and methods

2.1. Participants

Between February 2014 and April 2015, 1780 adolescents (13 to 18 years of age) from all 12 secondary schools in Dunedin, New Zealand, participated in the Built Environment and Active Transport to School (BEATS) Study (Mandic et al., 2015; Mandic et al., 2016). Participants with invalid surveys (n=38), incomplete student consents (n=20), lacking parental consent (n=59), missing survey data (n=48), boarders (n=162), missing distance to school data (n=11), and living >4 km from school (n=668) were excluded from the analysis, resulting in a final usable sample size of 774 adolescents.

2.2. Procedures

Recruitment procedures have been described in detail elsewhere (Mandic et al., 2016). Briefly, adolescents were recruited through schools and completed the online survey during class time under researcher assistants' supervision. All adolescents signed consent for taking part in the study. For those under 16 years of age, parents signed either parental opt-out or parental opt-in consent based on the school's preference. The study was approved by the University of Otago Ethics Committee.