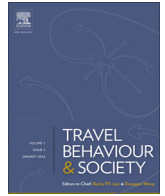




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Transport and child well-being: An integrative review

E.O.D. Waygood^{a,*}, Margareta Friman^b, Lars E. Olsson^b, Ayako Taniguchi^c^a École supérieure d'aménagement du territoire et de développement régional (ÉSAD), FAS-1622, Université Laval, Québec, Canada^b The Service and Market Oriented Transport Research Group (SAMOT), Karlstad University, Sweden^c Department of Risk Engineering, University of Tsukuba, Japan

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ABSTRACT

Understanding children's travel is an important part of drawing a complete picture of over-all well-being in society. Children's active travel to school, independent travel, transport and physical activity, and crashes have been reviewed, yet it may not be a complete picture. If research on children's travel has the ultimate goal of improving children's well-being, there is currently no general synthesis on the research linking transport and child well-being. This integrative review asks, "what evidence is there that transport affects child well-being?" It organizes the findings by two key measures: the domain of well-being and the transport means-of-influence. The five main domains of child well-being are: physical, psychological, cognitive, social, and economic. The three means of transport influence are: as access, intrinsic, or external. Findings are identified as being consistent, inconsistent, or one-off (e.g. only one study). The results show that transport plays a role in all domains of children's well-being. Most benefits identified are associated with active travel and independent travel. Most negative impacts are associated with traffic. While numerous one-off results exist which suggest that there may be many other impacts, research that repeats prior work is needed to support or refute these such results. Finally, potential relationships between transport and well-being are suggested.

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1. Introduction

Research on the links between transport and well-being of adults has gained traction in the past few years (e.g. Reardon and Abdallah, 2013). Unfortunately, research on the relation with child well-being is not available from one source, but is rather dispersed over many studies. There is a considerable body of research and reviews from the past decade that seeks to explain children's travel and reviews of such research exist (e.g. Sirard and Slater, 2008). However, the reason for studying children's transport is not always clear as transport planning is often based on the value of time, a metric that includes travel for work or travel's relationship with an individual's income (though this approach is being contested) (Ettema et al., 2011; Jain and Lyons, 2008). These metrics are based more on adults than children. Children do not work and have no "value of time", so one previous justification for children's travel research was the increasing dependence of children on parents for travel. Framing children's travel in this way negates their autonomy and increases the chauffeuring burden on the parent

(e.g. Hillman et al., 1990). The chauffeuring burden could be quantified through the value of time of the parent.

One method of reducing the chauffeuring burden would be autonomous travel. This has the additional benefit of including active travel (either as one component, or the complete trip). One of the first papers to suggest that active travel might play an important role in children's daily physical activity was by Tudor-Locke et al. (2001). The research on active travel gained momentum as questions surrounding obesity began to emerge. A recent review examined whether there was a clear relationship between autonomy, active travel, and weight status (Schoeppe et al., 2013). Autonomous travel's positive contribution to physical activity was supported, though the relationship with obesity was not clear. With respect to explaining the likelihood of autonomous travel, a previous review of autonomous travel examined the methods used in such research and suggested a more complete behavioural model (Mitra, 2013).

A non-economic concern was raised with respect to traffic danger. The World Health Organisation produced a report showing that globally motor vehicles were the number one cause of death for individuals under the age of 25 (Toroyan and Peden, 2007). With road traffic crashes, impacts such as property damage or physical harm are often measured. However, although such reports

* Corresponding author.

E-mail address: owen.waygood@esad.ulaval.ca (E.O.D. Waygood).

mention that impacts apart from physical harm exist such as psychological impacts, they are not detailed.

While the economic and physical well-being attributes of children's travel have been studied and reviewed, the current body of transport research does not address how transport influences many facets of well-being beyond physical activity and road traffic crashes. As a primary goal of planning is to improve the well-being of society, the question here is: *what evidence is there that transport affects child well-being more holistically?*

Previous research has looked at child well-being or quality of life. Such research focused on transport (Hillman, 1993), the built environment (Lennard and Lennard, 2000), children in urban environments (Davis and Jones, 1996), or children and planning (Matthews and Limb, 1999; Gilbert and O'Brien, 2005). The first (Hillman, 1993) is an edited book containing a collection of articles that deal with many of the topics to be addressed in this review. Lennard and Lennard (Lennard and Lennard, 2000) take an architectural approach relating many of their arguments to social and community interaction, amongst others. Davis and Jones (Davis and Jones, 1996), focus on the differences between needs, perceptions, and affordances between children and adults in urban settings. Finally, Matthews and Limb (Matthews and Limb, 1999) convincingly argue that much of Western planning focuses on the needs of one group, "white, ableist, adult, male, middle-class." Gilbert and O'Brien (Gilbert and O'Brien, 2005) make a similar argument. They highlight that planning focuses on the needs of adults, which likely leads to a system where children are more and more dependent on adults for their transport. Taken together, those books and articles make coherent arguments for improving transport planning with respect to children's well-being, but often lack references to support their assertions. This review will help fill that gap by providing an overall view of the research literature dealing with impacts of transport on child well-being.

2. Conceptual framework

2.1. Defining well-being

Well-being is a commonly used, but ill-defined term (Pollard and Lee, 2003; Dodge et al., 2012). Pollard and Lee (2003) explain that depending on the field of research it can refer to happiness, self-esteem, standard of living, or lack of depression. Those authors suggest that the following definition is the most useful: well-being is "a multidimensional construct incorporating mental/psychological, physical, and social dimensions." Dodge et al. (2012) conclude their article by defining well-being (or wellbeing) through a framework that balances resources and challenges in the three primary domains of psychological, physical, and social. In such, they discuss the importance of challenges to avoid personal stagnation. In Pollard and Lee's review (Pollard and Lee, 2003), which focused on children's well-being, they further suggest cognitive well-being (for example intellectual or learning related) and economic (primarily related to the economic situation of the household to which the child belongs). For each domain, the authors provide a list of measures that were used. That list is used in this review to identify obvious omissions for transport related impacts.

2.2. How transport affects well-being

How transport influences child well-being is a critical piece to consider. We propose that transport affects well-being through at least three means-of-influence (Fig. 1): as access, intrinsic (i.e. during travel), and external (i.e. transport by others). The original, and perhaps most common, approach is to examine transport as a means of access (e.g. to school). The second would be what impacts

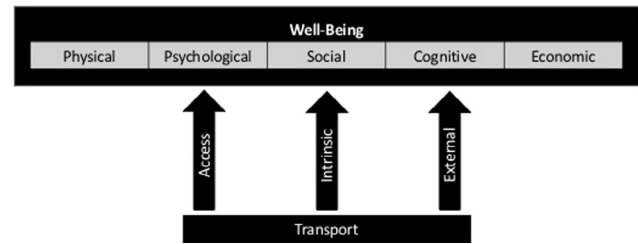


Fig. 1. Conceptual framework of child well-being and the three means of impact through which transport can affect them.

exist during travel whether they are intrinsic (e.g. active travel) or potential (e.g. a crash not caused by others¹). The third would be the impacts that accrue to the child due to society's transport behaviour (e.g. noise and air pollution; crashes caused by others¹). The impacts on child well-being in this review will be categorised by those three means of impact.

The objective of this review is to find what different relationships between transport and child well-being exist. Previously reviewed areas such as explaining trips to school (e.g. Mitra, 2013; Pont et al., 2009) or the potential for active travel to contribute to a child's physical health (e.g. Schoeppe et al., 2013) are summarized, but are not discussed extensively as such discussions exist in those reviews. Literature related to those areas were eliminated from the papers reviewed in this work. The intention is to create a resource for the general state of knowledge on the topic of transport and child well-being.

The findings are organised by the conceptual framework displayed in Fig. 1. As shown, the transport influences are first organised by the relevant domain of well-being identified by Pollard and Lee (2003), and then by the means-of-influence by transport. If similar findings occur, these are termed "consistent findings" meaning that some corroboration exists. The term "inconsistent" is used for findings that do not support each other. For example, one article reports a correlation, while another finds no correlation. In many cases, associations are found, but are not tested or reported in other papers found through this review. In those cases, the term "anecdotal" is used for these one-off findings.

Consideration to cultural-specific findings is given as well. Two reports with the same finding from the same country would imply country-consistent findings. Reports from culturally similar (e.g. Canada, the USA, Australia, New Zealand) would imply cultural-consistent findings. Consistent findings across divergent cultures would imply more universally consistent results. Thus, consistent findings are identified as either culturally specific or international.

3. Method

This is an integrative review. An integrative review differs from other types of reviews (e.g. systematic, meta-analysis) as it allows for the combination of quantitative and qualitative research (Whittemore and Knaf, 2005). It differs from systematic reviews that use explicit quality criteria to summarize and synthesize empirical data, or meta-analysis reviews that use statistical analysis to combine evidence from multiple primary studies. Integrative reviews differ from meta-synthesis reviews that aim to interpret and present a number of qualitative studies. Transport research encompasses a vast range of methods that include quantitative

¹ To help explain our approach to the difference between a crash not cause by others and a crash caused by others, let us take the example of a bicycle crash in two different situations. A child crashes their bike trying to do a jump would be a crash not caused by others. A child on a bicycle who is hit by a non-attentive driver is a crash caused by others.

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