Children's mode use connections with independence, seeing known people, and exercise: The Osaka Metropolitan Area case

E. Owen D. Waygood and Ryuichi Kitamura, Kyoto University

Abstract

Research into children's travel behavior has increased in recent years as research has shown decreases in independent travel and exercise, along with increased weight problems. Increased weight can lead to medical problems such as child onset diabetes. Patterns established as children may also be carried through to adulthood, increasing the risk of obesity and its related health problems. However, it is not yet clear how the built environment and community cohesion are related to independent travel and mode use, nor how those all relate to exercise.

Prior research suggests that population density is associated with children's independent travel and mode use, as well as community cohesion (represented by seeing a known person before reaching one's destination). It was also found that the amount of exercise was not directly related to population density. In other related research, seeing a known person was shown to be related to the amount of a child's travel that was independent. These results suggest that there are likely built environment and social factors that influence children's travel. This study looked at two-way relations between those various factors.

The area of study is the Osaka Metropolitan Area which has developed based on rail-transportation since the start of the 20th century. Japan over this period has had flexible zoning laws that allow for a greater mixture of land use than that seen in North America. This development pattern is reflective of principles of Transit Oriented Development.

The data for the study comes from a child-oriented travel dairy given to children in grade five at five different schools in distinctly different areas of the Osaka Metropolitan Area. In this paper, in line with previous studies the relationships between different built environment factors, seeing a known person before reaching ones destination (community cohesion factor), independent travel, mode use, and exercise were investigated. In addition to population density, the amount of road space per km squared of each child's neighborhood was determined and considered as a built environment factor. When that factor was divided by population density to give an estimate of the amount of road space per person in the neighborhood, which is representative of the ease of automobile use. Negative relations with independent travel and non-motorized modes were clearly evident for that factor. That result suggests that road space per person may be an appropriate factor in determining mode use and independent travel.

However, although population density was not clearly related to community cohesion, community cohesion did have a significantly positive relationship with independent travel. It was noted that areas that existed prior to stricter zoning laws which regulated minimum road widths had greater community cohesion. Independent travel and non-motorized travel were both positively related to "running-level" activities, suggesting that children who are able to reach destinations by themselves are more likely to do such activities. This reinforces the assertion that neighborhood parks, such as pocket parks, are important to children's health. It also suggests that built environments that facilitate greater independent travel by children can increase exercise.
This paper and previous research suggests that there is greater independent travel for children in area where there is less road space per person within the Osaka Metropolitan area, which is reflective of TOD development. (word count: 557)