

## An Exploration of Children's Independent Mobility in Post-socialist Urban Environment, The Case of Riga, Latvia

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**Abstract:** *Independent mobility beyond home provides children with an opportunity to acquire valuable spatial experience. Autonomous movements within public space enhance locomotor capability and promote development of spatial cognition for younger children as well as allow to improve social skills and construct identities for teenagers. However, nowadays this type of interaction with environment and the gain from it is endangered by manifestations of late modernity, based on increased use of cars in the everyday transport of children and parents' enforced concerns on child's safety. The aim of this paper is to explore the level of independent mobility of children aged 12 to 17 in Riga, the capital city of Latvia and to examine a wide range of background variables (such as gender, distance, ethnicity, age, place of residence, etc.) previously shown to have an influence on children's trips to school, friends and leisure activities. In this study the quantitative data was used to explain children's independent mobility within urban spatial domain. The data was derived by a questionnaire survey from children aged 12 to 17 in eight randomly sampled urban schools in Riga. The findings of this study reveal that age, gender and distance from home to school as well as parents' travel behavior are crucial factors which can prohibit or encourage children's independent mobility.*

**Keywords:** *independent mobility, children, Riga, travel behavior*

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### Introduction

Researchers have claimed that efforts to improve the living conditions of children in Western countries as well as changes of family travel behavior to a car oriented transportation mode due to shortage of time stimulated by complexity of modern urban life lead to reduction of freedom of children's mobility and autonomy (Fotel & Thomsen, 2004; Mackett, 2002; Rissotto & Tonucci, 2002).

The improvements of living conditions implemented mainly by adults from their perspective obviously was lead to gradual institutionalization of children's lives through participation in organized out-of-school activities after school. Changes in children's leisure time patterns are based on concerns of parents considering young people as potential victims exposed to abduction, attacks of gangs or traffic accidents as well as offenders and trouble makers stimulating to squeeze them out of public space (Valentine, 1996). Several researchers have conceptualized this phenomena as 'spatial bubble' (Matthews & Limb, 1999) or 'glasshouse childhood' (Kyttä, 2003) emphasizing that children and young teenagers are only observers, not actors. Reduction of independent mobility is not apparent as decline in territorial range or 'home range' (van Vliet, 1983; Matthews, 1987) where children may freely move, but in opportunities granted by parents and environmental setting to move independently to school or other certain places and explore the urban environment without presence of adults (O'Brien et al., 2000; Prezza et al., 2001; Wooley et al., 1999).

Although keeping children and young people indoor leads to their spatial isolation from society and making invisible in public space, previously mentioned changes of travel behavior for trips to everyday activity sites making children more dependent on adults are more worrying. The evidences from Western Europe and North America cities show that car use by children for daily mobility in the last 10-15 years has dramatically increased than in the rest of population (Mackett, 2002). For example, private car usage for school trips in Great Britain among children between the age 11 to 16 has grown from 15% in 1976 to 39% in 2001 (Pooley et al., 2005). The similar trend was observed in the United States of America where from 1969 to 2001 walking and cycling to school among children between the age 5 to 18 had declined from 41% to 12% and usage of car increased from 17% to 55% for school trips (McDonald, 2007). The increase of car use for reaching most of everyday activity sites has changed not only the way how children move through external environment, but also the way how they interact with this environment. Various studies from different countries indicate that regular car use mostly for school trips restrict the opportunity to increase children's daily physical activity level leading to health problems such as obesity (Armstrong, 1993; Cooper et al., 2003), hinder motor development (Huttenmoser, 1995), affect cognitive, social and spatial development as well as construction of identity (Orsini & O'Brien, 2006; Rissotto & Tonucci, 2002; Wooley et al., 1999).

Previous studies discussing decline in children's and young people's independent mobility through increase of parents chauffeuring identified several significant factors. First, growth of distance, considered as 'consequences of spatial development of modern society' (Mattson, 2002), between home and school or other activity sites mainly due to suburbanization is a crucial factor for young people to choose an active (independent) or passive (dependent) transportation mode (Fyhri & Hjorthol, 2009; McDonald, 2008).

Second, many researchers show that parents restricting independent mobility of their children chauffeuring them to school or other organized activity sites strive to protect young people from bad influence of external environment (Fyhri & Hjorthol, 2009; Hillman & Adams, 1992; Hume et al., 2009; McDonald & Aalborg, 2009). Valentine (1997) suggests that such restrictions are primarily constructed on children's age and gender, and based on parents' irrational concerns about safety of their siblings assuming that they are innocent, vulnerable and incompetent to cope with dangers encountered in public space despite the fact that children are often actually more competent than presumed by parents. The stereotypical parents' view assuming that girls are more vulnerable than boys determines more restrictions for younger girls constraining their freedom of movement within urban public space (Matthews, 1987; Valentine and McKendrick, 1997). The independent mobility differences between boys and girls gradually disappear at the age of 14 (O'Brien et al., 2000). Independent mobility rate of children and passive or active travel depend on household income, the number of cars owned by family and family driving habits associated with convenience of parents (McDonald, 2008b).

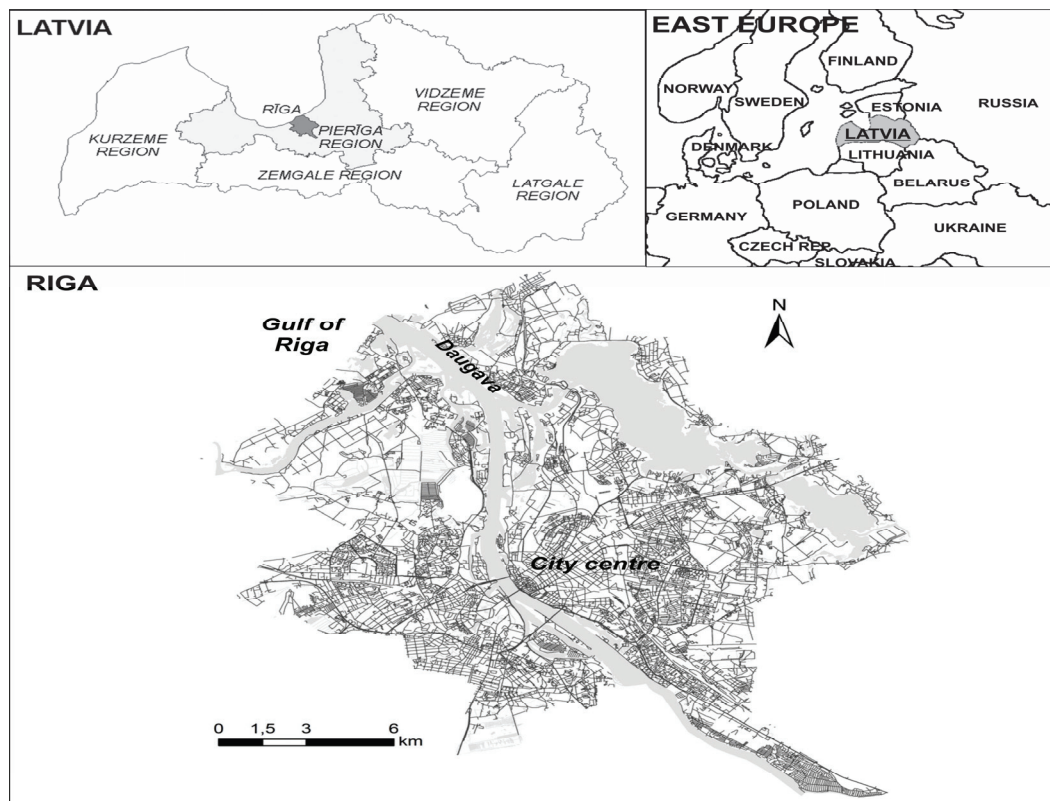
Although auto and public transport usage due to soviet urban planning guidelines among children for school trips are less in Riga than in Western cities (Burgmanis, in press), a rapid increase of car ownership, residential deconcentration, transformations of public transport system and formation of monofunctional structure of city raise doubts about opportunities for children to move freely within Riga as well as independently explore the urban environment.

These concerns also propose two important tasks for this study. First, to represent the factors affecting the level of children's independent mobility to most important activity sites within the city. Second, to reveal the effectiveness of previously described factors on children's independent mobility level.

The contribution of this study is also an exploration of older children's autonomy in commuting than in previous researches. The majority of previous studies primarily focused on younger children (under 13 years) rather than young people and common trends of their travel behavior as well as measuring their independent mobility.

### **Case study area**

According to data from CSB (Central Statistical Bureau) in 2010 in total area 307 km<sup>2</sup> of Riga there lived 709 140 inhabitants. The majority of inhabitants live in new neighborhoods where the dominant type of building is multistory houses which were built in Soviet times. Development of spatial structure in Riga has history more than 800 years and the city has concentric patterns which expanded with historical growth of the city adding new residential and industrial areas starting from the historical center and stretching towards the periphery (Grava, 1993). Significant transformations of the city occurred in the Soviet period when intensified construction of new neighborhoods which began to grow outside the city's railway ring on both sides of the river Daugava was initiated. Each of new-built neighborhood was adopted from the Western neighborhood concept (Grava, 1993) and planned as a residential area with easy accessibility to most indispensable services such as children daycare center, school, local shop, health center, public-utility service, recreation centers, green areas and public areas for recreation.

**Figure 1.** Area of the case study and its location

**Source:** Department of Human Geography, University of Latvia, Riga City Council City Development Department

Riga had undergone a period of political, social and economic changes after the collapse of the Soviet Union in the early 1990s. Under the conditions of the market principles and newly established real estate market, the ability of commercial uses to outbid all other activities from the central zone pushed residential functions to more peripheral locations (Stanilov, 2007). The patterns of public transport also approve that Riga has a monocentric structure because most of the public transport routes intersect the city center or use it as a terminal shaping center-based system (Grava, 2007).

## Methodology

The data for this study was obtained from a survey called “The Study of Children’s Activities and Perception of Urban Environment” conducted in February 2010. Questionnaires were distributed to students from grades 6 to 11 in eight Riga schools. The selection of schools for surveying was made considering their location and language of tuition. Hence eight both Latvian and non-Latvian speaking schools were chosen from five residential neighborhoods. 2489 students were surveyed in total, of which 72 were out of the defined study sample age group 12 - 17 years and 116 respondents had filled the questionnaires inaccurately. The highest margin (17 years) of the study sample age group was chosen due to the fact that young people can receive a driving license having reached 18 years. The questionnaires (188 in total) not corresponding to conditions of the sample were eliminated from a further analysis. Further, in data analysis for the statistical analysis 2301 (92% from total survey sample) correctly filled questionnaires were used.

The survey consisted of several parts. The first part elicited general socio-demographic information about the respondent and his/her household characteristics. The second part of the questionnaire examined young people’s travel behavior to school. The last set of questions dealt with family driving habits. For estimating the travel distance from home to school the Google maps were used.

In this study, to reveal and explain the factors affecting independent mobility of children a multiple linear regression model with statistical data processing software SataMP 10 was created and used. For this purpose the respondent’s self-reported most frequently chosen travel mode to four destinations was considered (to school, formal out-of school activities, friend and city center). Based on these four variables using similar technique as Fyhri & Hjorthol (2009) an additive mobility index was constructed which further in data analysis was employed as a dependent variable. Walking

and cycling were each given three points, using public transport two points and car one point, so that maximum score for each of four variables was three points. These points were summarized, thus giving an index ranging from 4 (lowest independent mobility level) to 12 (highest independent mobility level) (for more detailed explanation of this technique see Fyhri & Hjorthol, 2009). 437 respondents (19%) who did not participate in out-of school activities were excluded from final data analysis so that any child could potentially obtain maximum score on the index.

In this study the original approach of constructing an additive index of independent mobility was slightly changed. Transportation mode to the city center was measured, because the previous researches (Burgmanis, 2011) referring on monofunctional spatial structure of Riga suggest that the city center is a very significant spatial domain in children's lives.

**Table 1.** Description of independent variables

| <i>Categorical variable</i>          | <i>Percent</i> | <i>Continuous variables</i>    |      |
|--------------------------------------|----------------|--------------------------------|------|
| <b>Gender</b>                        |                | <b>Age (years)</b>             | 14.6 |
| Boys                                 | 49.6           |                                |      |
| <b>Ethnicity</b>                     |                | <b>Distance to school (km)</b> | 4.4  |
| Other ethnic groups                  | 35.2           |                                |      |
| <b>Present education level</b>       |                |                                |      |
| Secondary school                     | 25.2           |                                |      |
| <b>Place of residence</b>            |                |                                |      |
| Capital city (Riga)                  | 87.3           |                                |      |
| Republican and other cities          | 2.7            |                                |      |
| Municipalities of Riga agglomeration | 10.0           |                                |      |
| <b>Location of school</b>            |                |                                |      |
| Zolitude                             | 22.7           |                                |      |
| Kengarags                            | 11.3           |                                |      |
| Centrs                               | 13.4           |                                |      |
| Teika                                | 22.3           |                                |      |
| Purvciems                            | 30.4           |                                |      |
| <b>Parents' car use frequency</b>    |                |                                |      |
| More than 3 times a week             | 79.2           |                                |      |
| <b>Type of dwelling</b>              |                |                                |      |
| Private house                        | 21.6           |                                |      |

Explanatory variables widely discussed in previous researches from Western countries adding only few factors which are characteristic for Riga and other East and Central Europe cities were included in the multiple linear regression model (see independent variables in Table 1.).

## Results and discussion

The results of multiple linear regression model (Table 2.) show that, when all variables are considered together, the age of child and gender explain all positive gradual growth of independent mobility index. The increase in age by one year leads to approximately 10% growth of independent mobility index. Similar findings showed Clifton (2003) indicating that older teenagers gain independence in their daily travels more regularly than their younger counterparts. The results of this study also confirm findings from previous studies (McMillan, 2006; McDonald, 2011) that boys move more freely to various activity sites than girls. These differences equalize at the age of 14 (O'Brien et al., 2000). Although the multiple linear regression is appropriate for statistical analysis of children's independent mobility in this study, limited opportunities to predict the margin at which age differences in mobility patterns equalize draw attention on the weakness of such a tool. Another significant explanatory variable of independent mobility level is ethnicity. Probability to use passive transportation modes to activity sites is higher for non-Latvians. However, this finding has no well-grounded explanation in case of Riga as a post-socialist city and should be researched more detailed in future studies.

In the model there were included dummy variables which allowed to compare the effect of school locations where the survey on children's independent mobility level took place. The results showed that children who attend school situated in the furthest neighborhood (Kengarags) from the city center are more regularly encouraged to use passive transportation modes to reach school, formal activity sites and friends.

**Table 2.** Results of Multiple linear regression model. Factors influencing the degree of children's independent mobility.

|  |                                      | <i>Model</i> |    |
|--|--------------------------------------|--------------|----|
|  |                                      | $\beta$      |    |
| <b>Age</b>   |                                      | 0.101        | ** |
| <b>Gender (ref: girls)</b>                                   |                                      |              |    |
|  | Boys                                 | 0.173        | ** |
| <b>Ethnicity (ref: Latvians)</b>                             |                                      |              |    |
|  | Other ethnic groups                  | -0.360       | ** |
| <b>Present education level (ref: primary school)</b>         |                                      |              |    |
|  | Secondary school                     | 0.065        |    |
| <b>Place of residence (ref: republican and other cities)</b> |                                      |              |    |
|  | Capital city (Riga)                  | 0.017        |    |
|  | Municipalities of Riga agglomeration | 0.182        |    |
| <b>Location of school (ref: Zolitude)</b>                    |                                      |              |    |
|  | Kengarags                            | -0.420       | ** |
|  | Centrs                               | 0.169        |    |
|  | Teika                                | 0.044        |    |
|  | Purvciems                            | -0.056       |    |
| <b>Parents' car use frequency (ref: &lt;3 times a week)</b>  |                                      |              |    |
|  | More than 3 times a week             | -0.649       | ** |
| <b>Distance to school</b>                                    |                                      | -0.225       | ** |
| <b>Type of dwelling (ref: apartment)</b>                     |                                      |              |    |
|  | Private house                        | -0.356       | ** |
| <b>Summary of model</b>                                      |                                      |              |    |
|  | N                                    | 1864         |    |
|  | F value                              | 59.253       |    |
|  | Probability                          | 0.000        |    |
|  | Adjusted R <sup>2</sup>              | 0.289        |    |

Note: Significance \*\* $p < 0.001$ ; \* $p < 0.05$

The finding that frequent car use among parents reduces the score of independent mobility index is not surprising and is consistent with several previous studies (Fyhri & Hjorthol, 2009). Hence it is obvious that parents' travel behavior and driving habits shape children's travel behavior. Previous researches from various fields also show that although chauffeuring of children to school and other activity sites is comfortable for parents and enable to dissipate concerns about safety of siblings (McDonald & Aalborg, 2009), for children regular and frequent car use can reduce the activity level provoking health problems (Cooper et al., 2003), opportunities for socializing and face various social situations (Prezza et al., 2001) as well as promote unsustainable travel mode choice in the future (Line et al., 2010).

Regression model also shows that the increase of distance by 1 km between home and school leads to a 22.5% decrease in a respondent's independent mobility index. This finding is not surprising and also consistent with the majority of previous researches about children's mobility patterns in Western countries.

The strong negative effects on independent mobility show the type of respondent's dwelling. The mobility of children living in a detached house is more dependent on parents' chauffeuring than those who live in apartment houses. The results from some previous studies (Burgmanis, in press) considering children's travel behavior in Riga showed that the existing relationship between dwelling type and transportation mode choice partially explained this finding by differences



in families' income level. Although this phenomenon has not previously been widely supported by empirical studies from post-socialist cities, logically it is clear that families with higher income level can choose to live in more desirable conditions, afford a private car and use it more regularly than families with less income level. Another explanation is associated with technical details of study data sample formation where there were included both, children living in Riga and in Riga agglomeration. Considering that the dominant type of dwelling in Riga agglomeration is a private house and the distance from places of residence located within outskirts of the city is larger, it is obvious that children living in a private house are more mobility restricted than their counterparts living in the city and forced to use passive transportation modes due to limited accessibility of activity sites.

## Conclusions

It is clear that in late modernity the daily lives of children are more institutionalized or using terms of Zeiher (2003) can be characterized by 'insularization' and are extremely dependent on parents. Dramatic changes of parents' travel behavior lead to similar changes in children's mobility patterns to most important activity sites. Children's opportunities to reach the school, formal leisure activities and friends are also influenced by the distances, parents' travel patterns and concerns about safety. These trends decrease autonomy for children to move freely and use active transportation modes. Similar patterns of children's mobility are also observable in post-socialist cities.

Although most of previous researches were conducted in Western countries with children younger than 13 years, this study considering Riga as a case study and 12 to 17 years old children as test persons also shows variations in independent mobility level comprising wide range of explanatory variables. The main transportation modes to four significant activity sites in children's daily lives were used to measure the independent mobility level.

A multiple linear regression model shows that older children and boys travel more independently than younger children and girls in Riga. The acquired results also suggest that the distance to school and parents' travel behavior prohibit children's active commuting. The increase of distance from home to school and car usage by parents both lead to more dependent transportation by children. It is more obvious in the case of children who commute from suburbs to the city because the distances are significantly longer than for those who live in Riga. The negative effect of distance on walking in Riga should be also considered as a logical fact that most people are not willing to walk long distances.

This study performed in a post-socialist city demonstrates that the significant effect on children's independent mobility have the factors which previously was not supported and discussed by the studies from Western Europe and North America such as ethnicity and type of dwelling.

Finally, this study overlooks the effect of urban form on children's independent mobility level which has been discussed in previous studies. The relationship between variations of mobility or autonomous commuting level and urban form and design should be explored more detailed in further studies.

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