



Socio-economic Factors and Children's Walking to and from School

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Abstract

Crime prevention is considered as the main agenda of the government. Nevertheless, it has usually been overlooked that the victim him/herself can be the contributing factor to the criminal incident. The main problem is in educating the community on the preventive measures that could be taken in order to avoid victimization of individuals. Such suggestions are based on Islamic principles. Hence this paper discusses the preventive measures that can be observed by both individuals and the community to prevent criminal victimization.

Keywords: Criminal victimization; safe community; community inclusion; society and education

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1.0 Introduction

In recent decade, for many parents it is difficult to allow their children to walk to and from school on their own. Concurrently, for many parents driving their children or walking with them to and from school every day may not be feasible (Yeung et al., 2008). Therefore, walking autonomously to and from school is an opportunity to shift a portion of motorized trips to active travel trips if accessibility, safety, and the social benefits of this experience is being addressed. Although walking with parents provides a healthy, non-polluting, and economical travel mode for both parents and children; it limits children's opportunity to learn how to function safely in an urban environment (Gallimore et al., 2011). Considering children as frequent pedestrians means changing the living conditions in the city, starting with the street layout and traffic regulations, and also covering community life to improve the perception of safety.

Problem statement

Over 50% of school trips are made by private cars in Tehran. The increase in car speeds might be the cause of the severe injuries in accidents, especially for children. In Tehran more than 15% of those who are injured in car accidents are below 10 years old (Rasouli et al., 2008). However, there is no speed limit around the schools in Tehran; only installing speed bumps force drivers to slow down. The research by Department of Traffic and Transportation (2006); revealed that the long distance between home and school, and lack of traffic safety are the main barriers to children walking to school without an adult. Improving the immediate built environment around the primary schools; and decreasing the distance between home and school, is the direct reaction to reply to this hypothesis.

Aim of study

This study explores the association between parental perception of traffic safety in the neighborhood, with the likelihood of a child walking to or from school in Tehran. It further attempts to find out if number of cars in a household, and the average of monthly household income change the relationship between perceived traffic safety and modes of children travel to or from school

2.0 Literature Review

Since last two decades, a large body of literature about walking to and from school have found that some built environment factors such as concerns about traffic safety, road conditions, lack of supervision, land use, street width, and the lack of pavements are the contributing factors (Dissanayake & Morikawa, 2010).

Built environment has also impact on travel time and distance, which has always been the preliminary impediment for children in their walking to school. In last two decades, due to changes in land use, the distance between schools and home has increased (Beck & Greenspan, 2008). Consequently, children are less likely to walk to and from school. Additionally, statistics show that although walking to school has recently decreased; the injuries of children pedestrians have increased. Some parents who drives their children to

school; do not pay enough attention to pedestrian children. As a result, the closest streets to schools are often the most dangerous places for the children who walk to school (Ahlport et al., 2008). Safe Routes to School, attempts to improve the built environment to increase the number of children who are walking to school as well as educating them on traffic safety (McMillan, 2007).

3.0 Methodology

Only public primary schools were involved in this study; because of their neighbourhood orientation and the fact that the majority of primary schools in Tehran are public. Moreover, transportation policy makers target at primary-aged children to encourage them to walk to school (Shokoohi et al., 2011). A cross-sectional survey of parents was used to examine data from 18 schools in Tehran across three different socio-economic areas. Qualitative and quantitative data were collected at the same time and all data were integrated at analyse phase, to be able to compare the results (Creswell, 2003). The statistical program, SPSS-version 17 for Windows was used to analyse the data. Independent variables regressed on dependent variables using Multinomial Regression Models while the socio-economic variables were in interaction terms; to examine whether they change the relationship.

Limitations

This study explored barriers to children walking to or from school in urban areas; therefore, future research should consider exploring the barriers in rural areas, which may be different from urban areas (McDonald, 2008). Involving parents in the study and examining the traffic safety factors on the modes of transportation for children to go to and from school separately are strength of this study.

Research sample sites

School catchment areas were stratified into rich, middle, and low socio-economic statuses; see Fig 1(a). A multi-stage cluster sampling of schools was used, based on a complete list of public primary schools; see Fig 1(b) (de Vaus, 2002). There is no co-educational school in Iran; therefore, two schools were selected from each district, one male and one female, to be fair in gender terms.

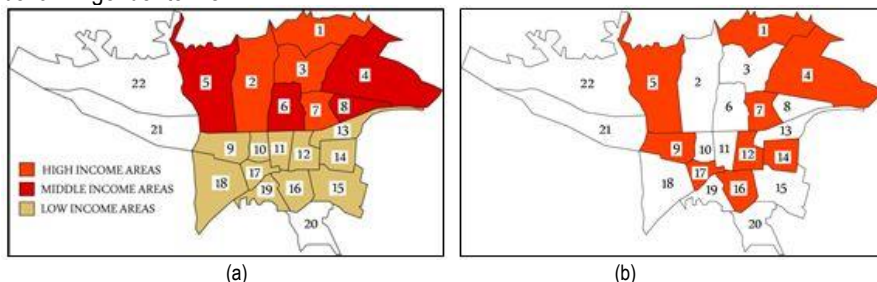


Figure 1: (a) Map of Tehran (a) showing income distribution, (b) showing schools catchment area (Source: Author)

Data collection procedure

Data collection was conducted during January and February in year 2009. Parents' questionnaires (N=561) were distributed to children in grades 3-5, at the selected schools to take home to their parents for their completion. The parents then returned the completed survey to school via their children on the following day. An overall survey response was 83%, and no follow-up was taken to capture non-respondents. The survey included both open-ended and close-ended questions, telephone interviews were conducted with parents who did not answer the open-ended questions (Creswell, 2003). The survey included general information, parents' work travel mode, parents' feeling and decision about their children's travel to and from school, parents' school travel mode and parent's perception of safety in the immediate school environment.

4.0 Results and Discussion

Public schools in Tehran have to enrol children who live in an area with 500m radius from the main entrance of the school; or their parents' workplace is located in that area. As such, their parents' workplace considered as a child's destination after school. Therefore, travel distance that is the main barrier to children walking to and from school, was excluded from analysis. However, only few students walked to school autonomously.

To understand if any factors impede children walking to and from school, we need to know both their current and favourite travel mode to school. Also, we should know the reasons if they cannot meet their desirable modes of travel to school. About 42% of children walked to school; however, about 20% of them were escorted by an adult. Moreover, there were some differences between a child's modes of transportation to and from school.

Children were more likely to walk with their friends while going back home from school. Few students used public transportation, and nobody chose cycling to or from school, so these modes of travel were excluded from further analysis. This may be explained by poorly planned roads for cycling, climate conditions during school time; and cultural norms. Being driven by parents had a higher rate among high-income groups, while low-income groups had the highest rate of walking to and from school.

The majority of parents reported, walking is the best school transportation mode for their children if they could escort them. Approximately 61% of parents reported traffic moving more than 30 km/hr in the neighbourhood as the main reason not to let their children to walk to and from school autonomously.

To examine the impact of perceived traffic safety factors on a child's walking to and from school, Multinomial Regression models were used (see Table 1). Children's modes of travel to and from school were limited to walking with an adult, walking without an adult, driven by parents and using a school bus.

Table 1: Multinomial Regression Models show the relationships between perceived traffic safety factors, socio-economic and socio-demographic factors and children modes of travel to and from school

		Children' modes of travel to school		Children's modes of travel back home	
		B	Sig.	B	Sig.
walk with parents/elder siblings	HOUSHLDCAR	0.971	0.279	-1.208	0.016
	[DRIVELIC=1.00]	2.37	0.019	1.152	0.045
	[UNDER5=.00]	2.511	0.004	-	-
	[KIDSNU=1.00]	-0.821	0.492	-	-
	[HOUSINCOM=1.00]	-0.15	0.919	-1.469	0.1
	[HOUSINCOM=2.00]	0.142	0.895	-1.533	0.027
	[MUMOCUP=1.00]	-	-	-0.578	0.333
	KIDAGE	-0.93	0.106	-0.637	0.069
	[CROSNOPAV=.00]	-3.02	0.046	-2.812	0.003
	[NONTRAFSIGN=.00]	-	-	1.647	0.038
driven by parents	HOUSHLDCAR	3.858	0.000	1.772	0.077
	[DRIVELIC=1.00]	0.283	0.827	-2.923	0.049
	[UNDER5=.00]	2.086	0.061	-	-
	[KIDSNU=1.00]	0.945	0.497	-	-
	[HOUSINCOM=1.00]	-0.791	0.666	0.408	0.809
	[HOUSINCOM=2.00]	-0.626	0.580	-0.225	0.844
	[MUMOCUP=1.00]	-	-	1.713	0.073
	KIDAGE	0.078	0.909	-2.208	0.000
	[CROSNOPAV=.00]	-2.542	0.113	-5.922	0.001
	[NONTRAFSIGN=.00]	-	-	5.396	0.001
[TRAFLAN=.00]	6.559	0.001	4.361	0.001	
school bus	HOUSHLDCAR	1.259	0.203	-0.646	0.38
	[DRIVELIC=1.00]	2.671	0.023	1.085	0.171
	[UNDER5=.00]	2.461	0.020	-	-
	[KIDSNU=1.00]	1.818	0.183	-	-
	Table 1: Continued			-	-
	[HOUSINCOM=1.00]	-5.643	0.001	-6.793	0.000
	[HOUSINCOM=2.00]	-1.618	0.15	-3.722	0.000
	[MUMOCUP=1.00]	-	-	0.85	0.259
	KIDAGE	-1.174	0.086	-1.793	0.000
	[CROSNOPAV=.00]	-4.009	0.013	-6.348	0.000
[NONTRAFSIGN=.00]	-	-	4.172	0.003	
[TRAFLAN=.00]	9.337	0.000	5.101	0.000	

*Note: the reference category is: walk with friends/alone; variables are significant at $p \leq 0.05$

The traffic safety factors were negatively related to the probability of a child walking to

school with friends or alone, relative to other transportation alternatives. This result was in the expected direction, as a higher value on the TS expresses a larger amount of perceived traffic barriers to children walking to or from school on their own. The proportion of street segments with more than four lanes of traffic, and absence of crosswalks were the only two influential traffic safety factors. When the percentage of narrow streets increased, the likelihood of children walking to school decreased. These findings contrast with the results of previous studies (Ahlport et al., 2008). It happened due to the absence of pavements in narrow streets; however, vehicles still can pass through, which make them dangerous for children.

To examine the probability of children walking to school relative to being driven by parents, number of cars in a household (HOUSHLDCAR) were significant; while average monthly household income (HOUSINCOM) only impact on choosing school bus.

Mother's occupation (MUMOCUP) impact only the probability of children walking back home relative to being driven by parents, which was not anticipated. It happened because 75% of mothers who participated in this study were housewives. Variables such as average monthly household income increases the probability of children walking back home with an adult over their walking autonomously. The average of the monthly household income impact only the likelihood of children walking back home with an adult, and using school bus relative to children walking alone. The results also show; younger children are less likely to walk back home without an adult, which is consistent with other literatures.

Parents reported that lack of painted crosswalks (CROSNOPAV), narrow streets (TRAFAN), and absence of traffic signs to stop traffic at intersections (NONTRAFSIGN) decreased the probability of children walking back home autonomously over their walking with their parents. Parents also indicated that traffic with high speed on local streets and all aforementioned traffic safety factors impact the choice of modes for children to go back home. The research findings support the general hypothesis that traffic safety impacts a child school travel modes, and it is consistent with the results of previous studies (Beck & Greenspan, 2008). However, there are other contributing factors, which increase the complexity of the association.

The research suggests that the average of household income, household car ownership and infrastructure in neighbourhoods significantly impact on parental concerns about traffic safety in the neighbourhoods. This can be explained that infrastructure investment was not distributed equally across different areas, and low-income areas have been ignored.

ANOVA test was used to compare parental perception of traffic safety, which negatively impacted on the probability of a child walking autonomously to or from school, across income groups. The result showed that the lack of painted cross-walks is a common perceived barrier for all income groups. However, parental perceptions of existing streets with more than 4 lanes of traffic, and lack of traffic signs to stop traffic at intersections vary across different areas (Table 2).

Table 2: ANOVA test: Initial differences between perceived traffic safety factors across income groups

Perceived traffic safety factors		Sum of Squares	Mean Square	F	Sig.
Cross a road with more than 4 lanes of traffic	Between Groups	10.88	5.44	28.18	0.000
Cross a road at an intersection that doesn't have a stop sign to stop traffic	Between Groups	1.357	0.678	2.728	0.066
Cross a road without a painted crosswalk	Between Groups	0.568	0.284	1.142	0.32

However, it is not clear yet if the various infrastructures conditions across areas are the only factors that change parental concerns about traffic safety; or other factors also impact choosing modes of travel for children to go to school. To examine this hypothesis, socio-demographic and traffic safety variables regressed on children's modes of travel to and from school while number of cars in a household and the average of monthly household income were in interaction terms. Parental concerns about their children safety if they have to cross the streets with more than four lanes of traffic to walk to or from school; were decreased due to the lower average of monthly household income and existing of only one car in a household. The results were anticipated, because rich families can afford to arrange transportation for their children or chauffer them to and from school (Table 3).

Table 3: Regression with interaction variables to establish the effect of TSI and NSI factors on the probability of children's walking to school

		Children's mode of travel to school			Children's modes of travel back home		
		B	x CAR	x INCOME	B	x CAR	x INCOME
			B	B		B	B
walking with an adult	[TRAFLAN=.00]	5.316	1.574	1.114	2.736	0.7	-0.213
driven by parents	[TRAFLAN=.00]	4.156	1.619	1.719	-	-	-
school bus	[TRAFLAN=.00]	10.674	3.187	3.691	12.433	2.338	2.988
	[CROSNOPAV=.00]	-	-	-	-11.659	-1.327	-2.457

*Note: the reference category is: walk with friends/alone; variables are significant at $p \leq 0.05$, first column from left, shows the magnitude of impact of traffic safety factors before socio-economic factors were interacting with them.

Conclusion

This research confirms that improving the infrastructure in front of the main gate of the schools is not enough to improve the parental perception of traffic safety in the neighbourhood. This study also provides an analytical framework to examine how traffic safety and socio-economic factors may relate to children's travel behaviour at different levels across different areas. As such, future research concerning people from different income groups and household travel needs would help in clarifying the transportation needs and preferences of different segments of the population. It will also lead to a more fair distribution of resources.

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