

The Role of Parental Attitudes towards Walking on Children Walking to Schools

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Abstract—Walking to school has been dramatically decreasing since four decades ago, worldwide. There is very little support yet on the validity of psychological theories behind choosing mode of travel to schools by parents for their children, particularly in developing countries. The present study aims to investigate the effect of parental attitudes towards walking on choosing walking (versus non-walking modes) to schools for the children of primary schools in Rasht. 1078 Questionnaires were distributed among students in nine elementary schools (including public and private boys and girls schools) in January 2014 (Return Rate: 80%). The questionnaire included instruments on parental attitudes toward walking, as well as instruments to collect a few socioeconomic and built environment attributes. The respondents were also asked to reveal the dominant travel modes by which their children had commuted to schools during the week before the survey. K-means cluster analysis, Principal Component Analysis (PCA) and Multivariate Analysis of Covariates (MANCOVA) showed that the differences between 'Comfort and convenience of walking' and 'Contextual and design preconditions for walking' as two principal components of parental attitudes towards walking are statistically significant between those parents allowing their children to walk to schools compared to those their children commuting to schools by non-walking means of travel. The research gives promising findings for making pragmatic policies, planning for activities and undertaking campaigns with the aim of promoting walking to schools.

Index Terms—attitudes towards walking, comfort and convenience, design feasibility, contextual and design preconditions, walking to school

I. INTRODUCTION

Walking to school is a physical activity among the children. Higher levels of physical activities can be attributed to walking, than using motorized modes of travel to schools [1]. Walking to schools gives the children occasions of maintaining the minimum levels of activities advised for health reasons. For example similar to the US and British children, the Canadian children are also advised to have 60 minutes of physical activities in fair to high levels at least, in order to keep physical and mental health in a good condition. However just very few of the children are able to undertake the requirement [2].

Walking to school has been dramatically decreasing since four decades ago. For instance while nearly half of school trips had been on feet or bicycles in the United States in the 70th, the share of non-motorized modes has been drastically dropped to less than 15 percent [3]. As another example in Toronto, Active School Travel (AST) has been decreased from 53% to 42% in morning hours and from 57% to 50% in afternoon hours during 1986 to 2006 [4]. Similar figures have been observed in the UK, where AST dropped from 75% in 1975 to 55% in 2001 among the 5 to 10 years old children and from 60% to 45% among the 11-16 years old children [5]. Even much drops have been revealed in the US, where a 30% reduction in AST from 1969 to 2001 among 5-18 years old students was recorded.

Decrease in AST is shown to be in line with obesity incidence among children in Canada and the United States. Obesity is assumed connected with children's sedentary activities like taking children to schools on vehicles [6]. Walking to school also alleviates the challenge of congested traffic in school zones. It also encourages the sustainable transport by less emission of

toxic gases from motorized means of transport. The above indications easily emphasize on encouraging opportunities of walking to schools. Investigating the contributing factors in Active School Travel is therefore very crucial in making relevant policies, planning for activities and undertaking campaigns with the aim of promoting walking to schools.

A. Contributing Factors in Mode Choice in School Trips

Exploring the literature suggests a wide range of factors contributing to children walking to schools. In many studies the students' social demographics (mainly the students' age and gender) have been found to significantly affect the children's travel mode to schools. (Mitra, *et al.*, 2010) proved an association between the low household income, the low neighborhood income and the travel mode to school [7]. Limited evidence indicate that parental work travel characteristics are correlated with escorted (i.e. accompanied by an adult caregiver) school trip, and that independent travel (i.e. trips without the supervision of an adult caregiver) is associated with the likelihood of walking [7]. Finally, built environment attributes and accessibility variables are also important determinants of children's school mode choice. Distance to school is one of the most remarkable variables influencing the use of non-motorized modes of travel [8]. Most studies report a negative association between concern over personal and traffic/pedestrian safety and the likelihood of walking/cycling among the children [7].

There is a growing body of research (but still very few) supporting that parental psychological precursors are also important parameters in the modes their children choose in traveling to school. McMillan (2007) for instance found that parental perceptions and attitudes towards safety and traffic situation in the neighborhood, as well as certain social norms are all more important influencing factors compared with the attributes of built environment in school travel mode choice [6]. Parents with more concerns about traffic and safety in the neighborhood are less likely to permit their children to walk or bike to schools.

Parental attitudes towards non-motorized modes of children travel to/from schools and attitudes' constituents have been subject of very few studies, almost all conducted in leading countries in transport. As a few studies of this context, (Seraj *et al.*, 2012) investigated the effects of parental attitudes (including attitudes towards distance between home to school, level of crime in the neighborhood, traffic speed, traffic volume and weather situation) as well as socio-demographics on walking and bicycling to schools [9]. Results suggest that school related variables, children age and gender all influence the so called parental attitudes. For instance older students are associated with less parental concerns about traffic speed and distance between homes and schools. Parents of boys are less concerned about the crime and traffic speed in the neighborhood than the girls' parents. Furthermore higher levels of income are associated with less concern about weather situation.

B. Aim and Scope

There is very little support yet on the validity of psychological theories behind choosing mode of travel to schools by parents for their children, particularly in developing countries. The present study aims to investigate the effect of parental attitudes towards walking on choosing walking (versus choosing non-walking modes) to schools for the children of primary schools in Rasht.

C. Theoretical Support

The present research is established based on the Theory of Planned Behavior (TPB). TPB hypothesizes that intentions, together with perceptions of behavioral control (i.e. difficulty in performing a behavior), explain variations in the actual behavior, when resources and opportunities are available [10]. The intention to perform a certain behavior (e.g. walking to school) may reasonably be predicted from three psychological constructs namely attitudes, subjective norms and perceived behavioral controls. Based on TPB in this study, an association is assumed between parental attitudes towards walking and choosing walking for their children.

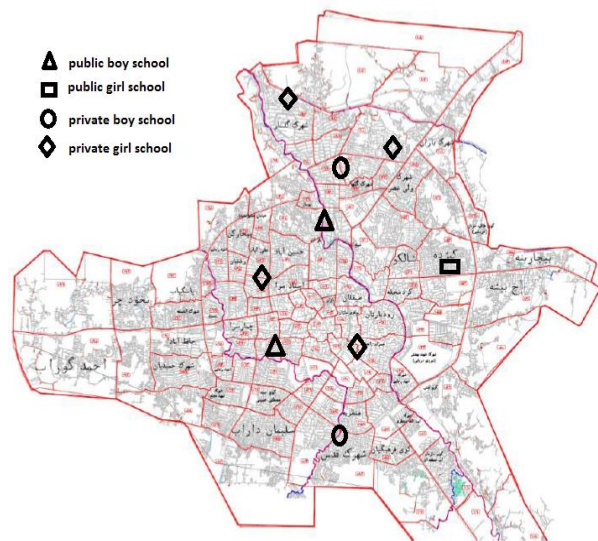


Figure 1. Selected schools' location for conducting the survey.

II. MATERIALS AND METHOD

Rasht is a city in northern part of Iran. It is the center of Guilan province and the largest city near the Caspian Sea coast line in Iran side with an area of 180 km² and a population of more than 550,000 according to the 2006 national census. The Industrialization rate is high in Rasht mainly because of being close to the Caspian Sea and the Anzali trade harbor. Walking, school service, Household private car/motorcycle, taxi, minibus, bus and bicycle are the dominant potential modes of travel to schools among the children in Rasht. The city form (Radiating streets from the city center combined with ring roads) [11] together with ever increasing rate of vehicle ownership (since a decade ago) and the poor traffic safety records has made the private cars and school service of

the most favorable modes of commuting to schools in Rasht in one hand and walking to schools rate has been decreasing in other hand. Questionnaires were randomly distributed among seven to nine year old students in primary schools to ask their parents to fill in the questionnaire. The data gathered in January 2014 in a cross-sectional survey among students. 1078 questionnaires were distributed among students at 9 public and private boys' and girls' schools. The schools are scattered on the map as depicted in Fig. 1 to make sure that all districts in terms of socioeconomics have been taken into account. 858 out of 1078 distributed questionnaires were returned (nearly 80% return rate). Only completely filled questionnaires without missing fields (n=735) were taken into analysis. The questionnaires were returned in almost the same rate from the boys' and girls' parents (The sample composition was 49.5% parents of boys against 50.5 % parents of girls). In this sample 93.3% (n = 686) of students' fathers and 67.3% (n = 495) of students' mothers obtained a driving license. Car ownership rate among the families was 67.2% (n=494).

A. Questionnaire

The respondents anonymously were asked to reveal the dominant travel modes by which their children had commuted to schools during the week before the survey. The main instrument included in the questionnaire intended to measure parental attitudes towards walking. The instrument was originally developed, validated and used by [12]. The instrument was turned into Farsi by a group of experts in both languages. The instrument originally includes 23 items (Such as 'walking is a method of transport that I would use and /or recommend, I feel more relaxed when I walk to my destination, Dirty and vandalized streets make people dislike walking, Good design of streets makes walking more enjoyable') to measure respondent's positive or negative opinions about walking and walking facilities provided in the city (as a mode of transport) on a Likert scale. The questionnaire also had questions regarding the general characteristics of household (e.g. the number of private cars the household owned, the occupational status and the income level) and the built environment (e.g. the household accessibility to public transport in way from home to school).

TABLE I. FREQUENCIES OF MODES OF TRAVEL TO SCHOOLS REVEALED BY PARENTS

number	mode	frequency	percent
1	Walking	139	18.9
2	School service	411	55.9
3	Household private car	163	22.2
4	Taxi	14	1.9
5	Bus	4	0.5
6	Father Motorcycle	3	0.4
7	other	1	0.0
Walking mode		139	18.9
Non-walking mode		596	81.1
sum		735	100

TABLE II. CONSTRUCT OF PARENTAL ATTITUDES TOWARDS WALKING IN EXPLORATORY FACTOR ANALYSIS

	Factor loading	Cronbach's α
Measure of parental agreement or disagreement about transport safety		
Component 1. 'Comfort and convenience of walking'		0.721
Walking is a method of transport that I would use and/or recommend	0.740	
Walking is the fastest way to travel for short journeys	0.734	
Walking is an interesting way to travel	0.704	
Walking is good for journeys in my local area	0.671	
I feel more relaxed when I walk to my destination	0.639	
Walking is a convenient way of getting about	0.562	
Component 2. 'Design feasibility for pedestrians'		0.679
I enjoy walking where pavements are well-maintained	0.819	
Good design of streets makes walking more enjoyable	0.777	
Walking for 20 minutes is something I would happily consider	0.700	
Component 3. 'Contextual and design preconditions for walking'		0.528
Dirty and vandalized streets make people dislike walking	0.792	
Traffic fumes make people dislike walking on Rasht streets	0.696	
I don't feel safe walking by myself in my local area	0.621	
Explained Variance		53.75%

B. Analysis

The frequencies of children travel modes revealed by parents have been depicted in Table I. No bicycling to school was reported by parents. All modes used are also classified into "Walking" against "Non-Walking" modes in this table. The respondents stated their level of consent on attitudinal statements on a five-point Likert scale ranging from 'strongly disagree' to 'strongly agree'. The items were coded in such an order to make higher scores reflect safer self-reported attitudes towards walking. According to the revealed frequencies for each mode of travel to school by parents, a cluster analysis was also applied to categorize the responses into two groups of "Walking" commuters versus "Non-Walking" commuters. K-means cluster analysis allocates each case to the cluster that has the nearest center point based on z-scores. To explore the items of parental attitudes towards walking exploratory factor analysis was used. A three component construct was drawn for the attitudes as depicted in Table

II. The first component denotes the extent to which the respondents feel comfort, convenience and relaxed while walking and therefore is called 'Comfort and Convenience of walking' with a high internal consistency (Cronbach's $\alpha = 0.721$). The second dimension address the respondents' opinions and knowledge about streets landscape, safety and security (Cronbach's $\alpha = 0.679$) and was called as 'Contextual and design preconditions for walking'.

The third dimension also addresses the role of well-maintained pavements and other design features and is called 'Design feasibility for pedestrians' (Cronbach's $\alpha = 0.528$). To assess the differences in parental attitudes towards walking (the dependent variables) by the mode of travel to school (walking versus non-walking as the fixed factor) Multivariate Analysis of Covariance (MANOVA) was conducted. Mothers driving license situation and the Household's accessibility to public transport in the way from home to school.

TABLE III. MANCOVA RESULTS

Measures	walking	Non- walking	F-values with LICM and PUBACC as covariates
Comp1. 'Comfort and convenience of walking'	3.90	3.78	3.938**
Comp2. 'Design feasibility for pedestrians'	4.56	4.55	0.018
Comp3. 'Contextual and design preconditions for walking'	2.93	3.01	3.817**

* $P < 0.1$, ** $P < 0.05$, *** $P < 0.01$.

LICM : Mothers driving license situation
PUBACC : household's accessibility to public transportation in route of home to school

III. RESULTS

To investigate whether the effect of parental attitudes between the children using "walking" against those using "non-walking" modes of travel to school, Multivariate Analysis of Covariance Analysis (MANCOVA) showed that, it was a significant overall difference in the judgments depending on transportation mode use (Wilks' $\lambda = 0.882$, $p < .05$). In relation to parental attitudes towards walking, it was a significant difference in components of walking attitudes between the two groups of respondents. As shown in Table III it was a significant difference in attitudes related to parental opinions about convenient and comfort of walking mode in transport between the two groups ($F=3.938$, $p < .05$). It was also a significant difference in attitudes related to Contextual and design preconditions for walking between the two groups ($F=3.817$, $p < .05$). The third attitude (Design feasibility for pedestrians ($F=0.018$, $p > 0.1$)) had no statistically significant difference between the two groups. It was an orientation that the group of respondents use walking instead of non-walking modes, were inclined in attractiveness, convenience and walking speed. Moreover dissonant streets landscapes, safety, sidewalks, traffic fumes, dirty and vandalized streets were less relevant for those parents that choose walking for their children compared to those select non- walking modes for their children in school trips.

IV. CONCLUSIONS

Socio-demographic measures have been most extensively used in predicting the children mode of travel to/from the schools and very little concern has been put on parental attitudes. In present study the relationship between mode use selected by parents for children to go to schools and parental attitudes has been investigated using an extensive survey among the parents in Rasht, Iran. 1078 questionnaire including validated instruments for measuring socio-demographic and attitudes were filled in by parents of primary school children in nine public and private boys' and girls' schools.

Principal Component Analysis (PCA) and Multivariate analysis of covariates (MANCOVA) suggest that 'Comfort and convenience of walking' and 'Contextual and design preconditions for walking' as principal components of parental attitudes, both affect children walking to schools. In this context parents believing that walking is a comfort, convenient interesting and easy to access way of travel to school most likely allow their children to walk to schools. On the other hand using motorized modes of travel to school by children is related to parental concern regarding the unpleasant scenes, safety and security issues in the way to schools. Results also suggest that the parental attitudes towards 'Design feasibility for pedestrians' are not significantly correlated with walking to schools. This means that developing

walking facilities does not necessarily lead in increasing in the rate of children walking to schools. This may be justified by the relatively fair condition of current walking facilities in the neighborhood of the schools where the survey has been conducted. In line with the above findings, aesthetically improving the existing pedestrian facilities, keeping the facilities neat, safe and secure all the time, besides emphasizing on safety and security merits in existing facilities (if any) and at the same time advocating walking to schools by the schools' officials may be considered as the first hand policies in increasing in the share of children walking to schools. Beside the parental attitudes towards walking, other social cognition variables such as risk perception can be suggested for investigation in children mode use to/from the schools as further studies.

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