



# The role of parental risk judgements, transport safety attitudes, transport priorities and accident experiences on pupils' walking to school



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## ABSTRACT

Walking to school could improve pupils' health condition and might also reduce the use of motorized transport modes, which leads to both traffic congestion and air pollution. The current study aims to examine the role of parental risk judgements (i.e. risk perception and worry), transport safety attitudes, transport priorities and accident experiences on pupils' walking and mode choices on school trips in Iran, a country with poor road safety records. A total of 1078 questionnaires were randomly distributed among pupils at nine public and private schools in January 2014 in Rasht, Iran. Results from valid observations (n = 711) showed that parents with high probability assessments of accidents and strong worry regarding pupils' accident risk while walking were less likely to let their children walk to school. Parents with high safety knowledge were also more likely to allow their pupils to walk to school. Parents who prioritized convenience and accessibility in transport had a stronger tendency to choose motorized modes over walking modes. Also, parents who prioritized safety and security in transport were less likely to allow pupils to walk to school. Elasticities results showed that a one percent increase in priorities of convenience and accessibility, priorities of safety and security, car ownership and walking time from home to school reduced walking among pupils by a probability of 0.62, 0.20, 0.86 and 0.57%, respectively. A one percent increase in parental safety knowledge increased the walking probability by around 0.25%. A 1 unit increase in parental probability assessment and worry towards pupils' walking, decreased the probability of choosing walking mode by 0.11 and 0.05, respectively. Policy-makers who aim to promote walking to schools should improve safety and security of the walking facilities and increase parental safety knowledge.

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## 1. Introduction

Among several critical variables, choices and actions regarding transport among parents could influence the transport behavior of their children. Choosing modes for school travels among young pupils is usually a critical decision made by parents (McMillan, 2005), particularly in less developed countries where there are concerns regarding the lack of safe infrastructure and school travel

services and programmes. In Western Europe, Australia and parts of North America on the other hand, the routes to schools are usually limited to dedicated 'Safe' routes, often regulated by dedicated programmes (e.g. Safe Routes to Schools) (McDonald, 2008; McMillan, 2007).

The above-mentioned programmes related to school travel have not been implemented in developing countries, including Iran. Independent travel of pupils, particularly by walking, is believed to constitute the required basis of their prospective social behaviors (Fyhri and Hjorthol, 2009; Timperio et al., 2004). Autonomous travelling to schools may also provide higher proficiencies that the children will need in the transportation system as they grow older. Primary school pupils are usually highly energetic and impulsive with no appropriate sense about the threatening risks in traffic (van

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Goeverden and de Boer, 2013). The traffic risk in Iran is even worse near the schools, where there is a substantial congestion due to increasing use of motorized modes like private cars taking children to the schools. In addition, motorized modes such as household private car and carpooling services used to take pupils to schools increase the risk of accident involvement in urban roads network (Albertsson and Falkmer, 2005; World Health Organization, 2013).

### 1.1. Key factors identified for pupils' mode use in previous school travel studies

Previous research has shown a set of characteristics which may relate to pupils' walking and the transport modes that their parents choose for them. However, the vast majority of the research has been conducted in Europe, the United States and Australia. These studies have shown that pupils' demographics (e.g. age and gender), household characteristics (e.g. number of cars owned by a household and parents' driving license status), built environment characteristics (e.g. distance/time from home to schools and accessibility to public transport) have been found to significantly influence walking and mode use among pupils on school trips. Further, some studies showed that boys walk/cycle to schools more than girls (McMillan et al., 2006; McDonald, 2012), while Mitra and Buliung (2015) reported no gender differences in school trip mode use. High school students often walk/cycle to schools more frequently than primary school pupils (McDonald, 2008). Households with higher income or several private cars are more likely to choose motorized modes for their pupils on school trips (Shokoohi et al., 2012; Li and Zhao, 2015). Most of the school trip mode choice studies have shown that home-to-schools spatial distance and travel time influence mode use among pupils. When the distance increases, the probability of choosing non-motorized modes (e.g. walking) decreases on school trips (Easton and Ferrari, 2015; Li and Zhao, 2015; van Goeverden and de Boer, 2013; Mitra and Buliung, 2015; Mehdizadeh et al., 2016a).

### 1.2. Contribution of the current study

Few studies have attempted to evaluate the relative role of parental psychological factors on pupils' walking on educational trips in developing countries with low transport safety levels (Mehdizadeh et al., 2016b). Iran is regarded to be one of the most unsafe countries in the world when it comes to road transport safety (WHO, 2014). The country has a 43.54 death rate per 100000 (age adjusted death rates) which is the highest in the world (WHO, 2014). Hence, identification and quantification of parental psychological characteristics about transport safety and their relationships with mode use among children (particularly walking vs motorized modes) is interesting to focus in countries with low levels of transport safety, such as Iran. The present study will focus on the link between parental psychological factors including risk judgments (risk perception and worry), transport safety attitudes, transport priorities, accident experiences, and the mode (walking vs motorized modes) they choose for their primary school pupils to travel to schools in an Iranian setting (see section 2.1 for a detailed description of the study context).

Carver et al. (2013) found that parental concerns for pupils' injuries are important for parental decisions about mode use among primary and secondary school pupils. Population studies have reported that transport risk perception (i.e. the probability of an undesirable event and the potential severity of consequences if it occurs) (Sjoberg, 1999) is an important variable for mode choice in the general public in Europe (Rundmo et al., 2011a; Roche-Cerasi et al., 2013; Nordfjærn et al., 2014a,b). This suggests that risk perception could be important for parental decisions to permit their children to walk to schools. For example, if parents assess

higher accident probability and severity of consequences when their children are walking to school, they are more likely to choose motorized modes such as private car or school service mode instead of active modes, such as walking. This line of reasoning is also argued in psychological theories, such as the Protection Motivation Theory (Rogers and Prentice-Dunn, 1997) and the Health Belief Model (Rosenstock, 1974).

While risk perception is a cognitive construct, worry is related to emotions but, simultaneously, associated with perceptions of risk (Rundmo and Nordfjærn, 2013). Worry denotes to direct emotional reactions to hazards and risky situations which are usually outside aware control, while perception of risk includes logic and rational thoughts in order to control the risk and cognitive evaluation (Rundmo et al., 2011a; Nordfjærn and Rundmo, 2010). Rundmo (2000) argued that thinking about a risk when you are anxious about it may cause worry. In this way, parental worry about pupils' walking and use of other transportation means may affect their choice on which modes their pupils should use. In the present study, we take both parental risk perception and worry into account as predictors of choosing walking mode versus motorized modes.

Although several studies have been conducted in regard of the link between safe driving behavior and attitudes (e.g. Iversen and Rundmo, 2004; Ulleberg and Rundmo, 2003), a very scant body of studies have surveyed parental psychological factors towards traffic and transport safety on school trips (e.g. McMillan, 2007; Woldeamanuel, 2014). Attitudes are considered to be one of the most essential psychological constructs that can shape behavior. In the Theory of Planned Behavior (TPB) (Ajzen, 1991) a strong relationship between attitudes and behavior is argued, an assumption that is also supported by empirical research. For instance, Rundmo et al. (2011a) showed that attitudes towards transport safety are associated with the modes that people tend to use the most (see also Moen, 2008). Rundmo et al. (2011a) showed that if an individual perceives low personal safety knowledge, then it would not affect mode choice decisions. In other words, Individuals who evaluated their knowledge of safety to be strong may be more likely to choose sustainable modes like walking instead of motorized modes (Rundmo et al., 2011a). Further, some studies have shown that attitudes together with socioeconomic factors could explain individual mode choice behavior among different transport modes (Şimşekoğlu et al., 2015; Shiftan et al., 2008). McMillan (2007) reported that psychological factors of caregivers, such as attitudes towards transport safety, as well as certain social norms in different countries are more important than built environment factors in school trip mode choice. Caregivers who have stronger concerns about transport safety and security in the neighborhood or streets that their children use to school have a lower probability to choose walking as transport mode for their children (McMillan, 2007). Seraj et al. (2012) examined the role of a few general factors on parental attitudes regarding pupils' mode choice on school trips and the results showed that school-related variables as well as age and gender among the pupils might be important precursors for shaping parental attitudes towards walking and bicycling. For example, higher pupil age is related with less parental concern and stronger attitudes towards allowing pupils to walk. Hence, it could be hypothesized that parental attitudes towards transport safety may be related with the transportation modes that they choose for their children. Identification of attitudes and their association with parental decision making might help to better understand different mode choices for their children on school trips.

In addition to risk judgements and attitudes, motivation and what people prioritize in transport could be related to mode choice. For instance, what a parent focuses on and prioritize in transport (e.g. price, safety or exercise) could influence the choice (Şimşekoğlu et al., 2015; Nordfjærn and Rundmo, 2015). What is defined as transport priorities in the current study is associated

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