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## The role of cultural factors and attitudes for pedestrian behaviour in an urban Turkish sample

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### ABSTRACT

There is a limited number of studies that examine the role of cultural factors and attitudes related to pedestrian behaviour. The aim of this study was to explore the role of cultural variables (i.e. vertical and horizontal collectivism, and individualism, as well as uncertainty avoidance) and attitudes towards pedestrian safety for reported risk-taking pedestrian behaviour in a sample of urban Turkish road users. An additional aim was to test whether the cultural factors had mediated relations to pedestrian behaviour through attitudes towards pedestrian safety. The results are based on an urban Turkish sample ( $n = 289$ , response rate = 64%) established in İzmir and İstanbul. The sample consisted of 169 females and 120 males. Their age ranged from 15 to 78 years ( $M = 32.00$ ,  $SD = 13.89$ ). A regression analysis showed that the cultural factors added to the explained variance of risky pedestrian behaviour above demographic and exposure-relevant control variables as well as attitudes towards pedestrian safety. Structural Equation Modeling showed that a mediated model had good fit and explained about 60% of the variance in attitudes towards pedestrian safety and 24% in pedestrian behaviour. Within this model, vertical collectivism related to lower levels of pedestrian risk-taking behaviour, while horizontal collectivism was related to higher levels of risk-taking behaviour. As expected, safe attitudes were related to lower levels of risk-taking pedestrian behaviour. The results are discussed in relation to hierarchy and authority orientations facilitated by the specific cultural factors and how such tendencies may relate to pedestrian risk-taking behaviour.

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## 1. Introduction

The high rate of pedestrian injuries and deaths is a major issue in road safety in Turkey. Although drivers and passengers constitute the majority of the approximately 10,000 annual traffic fatalities in Turkey, pedestrians make up 19% of the annual traffic fatalities (World Health Organization, 2012). The reasons for the high number of pedestrian accidents are complex, including underdeveloped road traffic infrastructure for non-motorized transport in Turkish cities (e.g. lack of pedestrian crossings and separated walkways) and aberrant driving behaviour. Meanwhile, a large proportion of accidents involving pedestrians is attributable to risk behaviour among these road users (Rosenbloom, Shahar, & Perlman, 2008; Taubman Ben-Ari & Shay, 2012; Zhou & Horrey, 2010). Studies that focus on pedestrians and factors underlying their risk behaviour are therefore essential in order to develop interventions to improve pedestrian safety. The present study aims to provide insights into the relative role of cultural and social-cognitive factors for reported risk behaviour in a Turkish sample of urban pedestrians.

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Previous studies that aimed to identify precursors of risky pedestrian behaviour focused on critical factors, such as personality characteristics, demographic characteristics and social cognitive factors, such as attitudes and risk perception (e.g. Diaz, 2002; Papadimitriou, Theofilatos, & Yannis, 2013; Schwebel, Stavrinou, & Kongable, 2009; Zhou & Horrey, 2010). Previous work that applied the Theory of Planned Behaviour (Ajzen, 1991) showed that components of the theory (i.e. attitudes, subjective norm and perceived behavioural control) predicted pedestrians' intentions towards traffic violations, such as aberrant road crossing behaviour (Diaz, 2002; Zhou & Horrey, 2010). Zhou and Horrey (2010) showed that pedestrians were more likely to report a strong intention to conduct aberrant crossing behaviour in a conformity scenario, where there were other pedestrians also crossing the road. Pedestrians with the sensation seeking trait tended to take more risks as pedestrians, whereas individuals with high attentional control (i.e. good ability to shift and focus attention) reported lower levels of risk-taking behaviours in another study (Schwebel et al., 2009). Risky pedestrian attitudes and behaviour were also related to male gender and low age in a recent large scale survey spanning across several European countries (Papadimitriou et al., 2013).

Studies that have focused on cultural precursors of pedestrian behaviour are scant. An exception is Rosenbloom et al. (2004) comparative study of pedestrians in conservative ultra-orthodox and more secular non-orthodox cities in Israel. This observational study showed that pedestrians in an ultra-orthodox environment, where individuals tend to reflect rather conservative religious views, conducted three times as many violations than those in a more secular non-orthodox environment (see also Rosenbloom et al. (2008); Taubman Ben-Ari & Shay, 2012). Although observational methods of pedestrian behaviour have clear benefits (e.g. reducing social-desirability bias among the participants), this method is complicated to use for studies aiming to examine the underlying cultural and intra-psychological variables of pedestrian behaviour. Studies using questionnaires may be needed to complement observational studies, in order to reveal the underlying cultural and psychological variables related to risk behaviour. Studies of pedestrian safety may also benefit from a solid anchoring in cultural theory, which can guide the process of operationalizing and measurement of cultural variables.

There are three main theoretical approaches to culture in relation to risk behaviour. A traditional approach has been to understand culture as social organization (Douglas, 1970; Douglas & Wildavsky, 1982). Within this framework, it is argued that perceived risk and risk behaviour differ according to different ways of perceiving the world (e.g. perceiving people as connected or disconnected from each other, the desired level of social control, etc.). Wildavsky and Dake (1990) argued that this theory can predict how people will perceive risk and how they behave in relation to risk, but this assumption has received only weak empirical support (Marris, Langford, & O'Riordan, 1998; Oltedal & Rundmo, 2007). An alternative approach is to perceive culture as differences in how people communicate through symbols (Geertz, 1973). By investigating to which extent road users focus on, for instance, sounds, visual information and writing in the traffic system, this theory has showed some promise in predicting driver behaviour (e.g. Rundmo, Granskaya, & Klempe, 2012). However, the contribution of these variables to the explained variance in risk behaviour tend to be rather low, hence alternative approaches of conceiving culture in relation to risk-taking behaviour are needed.

In the present study we operationalize and define culture through its consequences on beliefs, attitudes and values (Hofstede, 1980; Hofstede, 1984). Hofstede (1984) originally proposed that individualism/collectivism is a uni-dimensional concept and represents perceptions about values and beliefs along a continuum where individualism and collectivism represent the two dichotomous extremes. Individualism can be defined as the perception of the self as separated and distinguished from others and as consisting of unique attributes, while collectivism is defined as the perception of the self as belonging to a larger group (Markus & Kitayama, 1991). However, Triandis, McCusker, and Hui (1990) argued that individualism/collectivism could be multidimensional. For instance, they argued that the types of individualism that operate in the United States and Norway differ substantially. In the United States there is generally a focus on the self as a distinguished entity and there is a strong focus on gaining status in the hierarchy through competition with other individuals. The self is also generally considered to be distinguished from others in Norway, but simultaneously the community is more egalitarian than the United States and there is an emphasis on equality and individuals are not considered to be competing for hierarchic status to the same extent as in the United States. Due to such differences it could be argued that there are several dimensions of individualism and collectivism.

In a refinement of the Hofstede (1980, 1984) theory, Singelis, Triandis, Bhawuk, and Gelfand (1995) found empirical support for two dimensions of individualism and collectivism; vertical and horizontal individualism and collectivism. Individuals who have a tendency of vertical individualism stress the self as unique and distinguished from others, and also tend to perceive the self as unequal and in competition with others. People with high horizontal individualism also tend to perceive the self as a unique entity, but this cultural factor does not emphasize competition for social status in the hierarchy. In contrast, individuals with tendencies of vertical collectivism stress the self in relation to others, emphasizing conformity to authority and hierarchy, whereas people with horizontal collectivism tend to perceive others as equal to the self, but are generally less respectful and conforming to authority and hierarchy (see also Singelis et al., 1995). In addition to exploring how the individualism/collectivism distinction relates to pedestrian behaviour in the present study, we also included uncertainty avoidance into the analyses (i.e. the extent to which the individuals feel uncomfortable by ambiguity and uncertainty). The collectivism/individualism distinction is considered relevant for pedestrian behaviour because it may influence the levels of conformity towards regulations set by authorities and also conformity and social negotiations related to risky crossing behaviours (Zhou & Horrey, 2010). Additionally, uncertainty avoidance may also be relevant because those who score high on this variable may be more risk averse (Jung & Kellaris, 2004), and thereby less likely to take risks as pedestrians.

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