



Patterns of pedestrian attitudes, perceptions and behaviour in Europe

Eleonora Papadimitriou*, Athanasios Theofilatos, George Yannis

National Technical University of Athens, Department of Transportation Planning and Engineering, 5 Heron Polytechniou Str., GR-15773 Athens, Greece

ARTICLE INFO

Article history:

Received 19 December 2011
 Received in revised form 8 August 2012
 Accepted 19 September 2012
 Available online 27 October 2012

Keywords:

Pedestrians
 Attitudes
 Behaviour
 Principal component analysis
 Cluster analysis

ABSTRACT

This study aims to identify patterns of pedestrian attitudes, perceptions and behaviour in Europe, on the basis of the results of the SARTRE 4 (Social Attitudes to Road Traffic Risk in Europe) pan-European survey carried out in late 2010 and early 2011 (questionnaire-based personal interviews in 19 European countries involving 4290 pedestrians). The various components of pedestrian attitudes and behaviour (e.g. acceptance of measures and penalties, risk-taking behaviour, perceived level of service, etc.) were determined by means of a Principal Component Analysis (PCA) on 33 variables contained in the survey. Moreover, groups of pedestrians with similar attitudinal and behavioural characteristics were identified by means of a Two Step Cluster Analysis. The results revealed eight components, from which six are associated with pedestrian attitudes and two with pedestrian behaviour and were further analysed for different countries and different age and gender groups. Furthermore, the cluster analysis revealed three types of pedestrians. The first type concerns pedestrians with 'positive behaviour and positive attitudes'. The second type concerns pedestrians with 'negative behaviour and negative attitudes', a group into which male and young pedestrians are over-represented. The third type concerns neutral pedestrians with 'positive behaviour but mixed attitudes', a group that presents the largest dispersion between countries and whose proportion defines the dominant type of pedestrian in each country. However, the proportion of the different types of pedestrians in each country does not appear to be associated with pedestrian fatality rates.

© 2012 Elsevier Ltd. All rights reserved.

1. Introduction

1.1. Background and objectives

Road safety is dependent to a large extent on actual road users' behaviour, which is influenced by their attitudes, beliefs and perceptions. Consequently, knowing opinions and beliefs may help understanding traffic behaviour. More specifically, road users' perceptions and opinions about transport, road safety, control measures, etc., are very relevant to policy makers for understanding the road users' needs, the limitations of their policies and the potential support for new policies, at national or international level (SARTRE 4, 2011).

Pedestrians are the most vulnerable users of road transport networks, and their increased vulnerability is attributed on one hand on the lack of speed, mass and protection, compared to other road users, and on the other hand on their particular characteristics and behaviour, affecting the nature of their interaction with motorised traffic (OECD, 1998, 2012; ERSO, 2008; Yannis et al., 2007a). The knowledge of pedestrian attitudes, perceptions and behaviour

may thus assist policy makers in the better understanding of pedestrian behaviour issues and safety needs, and eventually in the planning and implementation of measures to improve pedestrian safety (Yannis et al., 2007b).

Various studies examine road users' social attitudes and behaviour, out of which several (Assum, 1997; Louka et al., 2004; Vanlaar and Yannis, 2006) are based on the SARTRE 1–3 (Social Attitudes to Road Traffic Risk in Europe) research projects, which aimed to analyse social attitudes and behaviour towards risk and safety in Europe by means of questionnaires and personal interviews. However, there are not many studies associated with pedestrians' attitudes and behaviour, especially at international level.

Pedestrians' attitude and behaviour data can be obtained through interviews with questionnaires, telephone surveys, direct observations, or through more integrated methods. The majority of researchers use questionnaires to grasp attitudes and behaviour. More specifically, a study made by Yagil (2000) examined the self-reported road-crossing behaviour of young student pedestrians by means of questionnaire. The results revealed significant gender differences. Another study (Granié, 2009) explored the effects of sex-stereotype conformity, perception of danger and risky behaviour of adolescent pedestrians and found that females are more compliant than males and that declared compliance was connected to behavioural compliance among females and not among males.

* Corresponding author. Tel.: +30 2107721380; fax: +30 2107721454.
 E-mail address: nopapadi@central.ntua.gr (E. Papadimitriou).

Bernhoft and Carstensen (2008) analysed preferences and behaviour of older pedestrians and cyclists by means of a questionnaire. It was found that older pedestrians appreciate pedestrian facilities more than the younger ones, and are also more influenced by the fact that an action is illegal. In a study using the same methods by Zhou et al. (2009), 426 pedestrians completed a demographic questionnaire, in order to measure their tendency towards social conformity, and another questionnaire based on the theory of planned behaviour in order to measure their intentions, behaviour, perceived risk, etc. The results indicate that pedestrians were more likely to cross the road when other pedestrians were crossing the road too. In addition, those who showed higher social conformity tendencies had stronger road crossing intentions than low conformity participants.

Lam (2000), carried out a population-based randomized telephone survey targeting parents with children in Australia, in order to investigate which factors are associated with the behaviour of parents as pedestrians with their young children. Results show that parents do not exhibit safe behaviour adequately in front of their children.

Direct observations as a method of data collection was applied (Khan et al., 1999), in a study that observed 250 pedestrians in Karachi, Pakistan, focusing solely on pedestrians' behaviour and not attitudes. Thirty five percent of the pedestrians crossing the street caused the traffic to swerve in order to avoid a conflict. Roadside observations were also applied to investigate the differences in pedestrians' behaviour by observing two entirely different urban places in terms of religion (Rosenbloom et al., 2004). Results showed that young and male pedestrians have a tendency to commit violations.

More complicated methods to collect data on pedestrian attitudes, perceptions and behaviours were also present in literature. For example, Granié (2007) examined gender differences in compliance with pedestrian rules among preschool children. First, children's behaviour as pedestrians was assessed and then each one was interviewed on pedestrian-danger appraisal, rule knowledge, rule compliance, etc. Moyano Diaz (2002), examined pedestrians' attitudes towards traffic violations and self-ratings of violations, errors and lapses, amongst a non-random balanced sample of 146 pedestrians from the city of Santiago, Chile. The results showed that young male pedestrians are at least in part responsible for high accident rates.

Sisiopiku and Akin (2003) analysed behaviours at and perceptions towards various pedestrian facilities, such as crosswalks, physical barriers and pedestrian warning signs. Pedestrian behaviour data were obtained from the reduction of video images of pedestrian movements recorded throughout the study site, while pedestrian perceptions were obtained through a user survey. The majority of respondents believe that motorists should yield to pedestrians only at designated crosswalks. Pedestrian replies in general, showed that '*pedestrians understand the purpose of streets with mixed traffic and are willing to compromise in order to have a fair and safe environment for all users*'.

It is noted that the attitudes of pedestrians towards driving rules, as well as towards annoyance from other road users, have not been adequately addressed in the existing literature. A recent report (NHTSA, 2008), summarised the key findings of the National Survey of Bicyclist and Pedestrian Attitudes and Behaviour in the US. It was found that the most important reason pedestrians felt threatened for their personal safety was due to other motorists (62%). Moreover, almost 40% of those who walk in the dark made efforts to make themselves visible to other motorists by means of light colour or reflective clothing, etc.

From the review of the existing literature it is concluded that pedestrian attitudes, perception and behaviour issues have attracted the interest of several researchers. Moreover, different yet

quite standardised methodologies exist and have been tested for capturing these attitudes and behaviours, and the existing literature provides useful and insightful results on pedestrian attitudes, perceptions and behaviour. However, the existing studies mostly focus on particular aspects (i.e. only attitudes or only behaviour, specific behaviour e.g. road crossing, etc.) and on particular populations (i.e. children, elderly), the samples examined are small, whereas no results comparing different countries are available. In the ongoing SARTRE 4 research project, the attitudes, perceptions and behaviour of a large sample of pedestrians are examined at European level for the first time.

The objective of the present study is to identify patterns of pedestrian road safety attitudes, perceptions and behaviour in Europe, on the basis of the results of the SARTRE 4 Pan-European survey. More specifically, the study aims to identify the components of pedestrian attitudes, perceptions and behaviour (e.g. acceptance of measures and penalties, risk-taking behaviour, perceived level of service, etc.). Moreover, it aims to identify groups of pedestrians with similar attitudinal, perceptual and behavioural characteristics, and analyse the results for different countries and different age and gender groups. Finally, it aims to explore the association of pedestrian attitudes, behaviours and perceptions with the fatality rates of pedestrians per country.

2. Data

2.1. The SARTRE 4 European survey

The SARTRE 4 project (SARTRE 4, 2011) deals with road users' attitude and perceptions in Europe in relation to road traffic risk. More specifically, the objective of the project is to survey and highlight with a uniform methodology many important issues such as mobility experiences, perception of safety needs by different types of road users, opinions and experiences about speeding and impaired driving, attitudes towards motorcycle riders, pedestrians and other road users. It is based upon a common survey carried out in each participating country and upon a shared analysis of the database. It is noted that the survey involved a personal interview for the filling of an extensive questionnaire.

The project provides a follow-up of the previous three SARTRE projects, with the inclusion of additional groups (other road users such as pedestrians, public transport users, cyclists and motorised two-wheelers), and a more policy-focused questionnaire. The questionnaire also includes issues that gained importance during the last years, e.g. 'eco-driving' and mobility, harmonisation, safety of motorised two-wheelers, risk to pedestrians in urban areas, security concerns or new traffic enforcement technologies. The gathered data aim to provide a current picture of road users' attitudes and opinions, with possibilities to compare between countries and identify possible reasons for differences.

In total, 21,280 questionnaires were collected, between November 2010 and February 2011, from 19 European countries, namely Austria, Belgium, Cyprus, Czech Rep., Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Israel, Italy, Netherlands, Poland, Serbia, Slovenia, Spain and Sweden. In each country, at least 200 pedestrians were interviewed, on the basis of simple random sampling at national level.

2.2. The SARTRE 4 data

The SARTRE 4 database, developed from the coding of the questionnaire responses, involved various common questions that all road users had to fill, followed by a separate section for each category of road user (car drivers, motorcyclists and other road users). The questions that were examined within the present research

Download English Version:

<https://daneshyari.com/en/article/6976465>

Download Persian Version:

<https://daneshyari.com/article/6976465>

[Daneshyari.com](https://daneshyari.com)