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The effect of attitudes toward cars and public transportation on behavioral intention in commuting mode choice—A comparison across six Asian countries

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ABSTRACT

This study investigated the contribution of psychological factors in explaining the choice of transportation mode in six Asian countries. Data were collected from 1118 respondents in Japan, Thailand, China, Vietnam, Indonesia, and the Philippines. The dependent variable was the intention to use one of three modes for work travel after getting a job: car, public transit, or other modes. The explanatory variables were three attitude factors taken from a previous study, including: 1/symbolic affective, reflecting affective motives of travel mode use; 2/instrumental, referring to functional attributes of travel modes; and 3/social orderliness which represents for environmental friendliness, safety, altruism, quietness et cetera. Several logit model estimates were made using the samples from the six countries separately and together. We obtained three main findings. First, attitude variables about the car were all significant determinants for the entire sample from Asian countries. Second, the social orderliness aspect of public transit was a common concern of respondents from developing countries in selecting this mode for work trips. Third, in countries in which the intent to use a car was not very high, attitude factors about the car were found to be significant determinants of the behavioral intention to commute by car but were less significant in countries in which the desire to use a car was high.

1. Introduction

Newly industrialized countries in Asia are experiencing rapid economic growth and urbanization, resulting in soaring travel demand in many large cities (Institute for Global Environmental Strategies, 2004; Poverty and Development Division, 2006). The increases in income and standard of living in urban areas are followed by the increased trend in car use (Hayashi et al., 2004). In fact, recent figures showed that the rates of increase in car ownership in some developing Asian cities are much higher than those in developed Asian countries with the same per capita level of income (Morichi, 2005). From another perspective, this trend toward the car for private travel has contributed to problems such as traffic congestion, environmental pollution (Hayashi et al., 2004; Morichi, 2005), and global warming. Such negative effects threaten the quality of life and mobility within societies (Mészáros, 2000; Steg and Gifford, 2005).

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Therefore, to move toward increased and widespread use of public transit in developing Asian countries, it is important for planners to manage the use of private transportation modes. This can take the form of travel demand management (TDM) or mobility management (MM), strategies aimed at changing the behavior of travelers.

The literature shows that TDM strategies using economic or regulatory tools with some tangible result are believed to be particularly appropriate in developing countries (Litman, 2004; Victoria Transport Institute, 2005). However, psychological strategies aimed primarily at changing attitudes have not yet been considered by policy makers in many Asian countries. This is partly because very few studies have investigated the psychological factors relevant to travelers in these countries. Meanwhile, MM measures such as the travel feedback program (Fujii and Taniguchi, 2005), TravelSmart (Department of Transport, Western Australia, 2000), Travel Blend (Ampt and Rooney, 1999), and Individualized Marketing (Brög, 1998), have proven to be effective and low-cost solutions for urban transport in several developed countries. Specifically, through communication and persuasion to provide detailed travel information and incentives or to use marketing techniques focusing on individual travel behavior, such measures have successfully induced changes in attitude, reduced car use, and increased the use of public transit (Department for Transport, UK, 2004; Fujii and Taniguchi, 2006). In many Asian developing countries, where a bias seems to exist toward private car versus public transit (Action Plans for Reducing Vehicle Emissions, 2002), such psychological measures could be very important for managing transportation demand.

In considering such a strategy, it is widely known that behavioral intention is an important psychological factor that determines actual behavior, and that attitude directly influences behavioral intention, as assumed in Ajzen's theory of planned behavior (Ajzen, 1991). Indeed, attitudes toward travel modes are among the determinants in deciding on the mode of travel for commuting (Vredin Johansson et al., 2006; Kuppam et al., 1999; Recker and Golob, 1976; Schwanen and Mokhtarian, 2005). It is therefore essential in developing countries to investigate and quantify the role of attitudes toward travel modes on the behavioral intention of choosing a commuting mode before embarking on any psychological approaches to MM.

Past studies have generally acknowledged that attitudes toward the car and public transit are composed of three main components: the symbolic, the instrumental, and the affective (Gatersleben, 2004, 2007; Steg, 2003, 2005; Steg et al., 2001). Symbolic aspects are related to the way people express social and personal identity. Affective aspects refer to emotional feelings of travelers, while instrumental aspects are mainly about benefits of using transport modes. Many studies have used different methodologies to investigate attitudes toward the car and public transport. However, many of them, for example, Anable and Gatersleben (2005), Hiscock et al. (2002) and Stradling et al. (1999), did not go beyond qualitative analyses. Among quantitative studies, the research by Steg (2003, 2005) can be considered seminal in factorizing attitudes toward travel modes. Using principal components analysis (PCA), Steg (2005) found three factors: symbolic affective, instrumental, and independence. This finding was in line with Dittmar's (1992) model which suggested that material possessions are strongly related to social and personal identity. In addition, after testing a theoretical model on motives regarding car use by applying attitudinal factors, Steg (2005) concluded that symbolic and affective motives play important roles in explaining the level of car use.

Most studies discussed above were carried out in European countries whose transportation systems differ in several ways from those in Asian countries. Following the quantitative approach by Steg (2005) using PCA, a more recent study by Van and Fujii (2011) in Japan, Thailand, China, Vietnam, Indonesia, and the Philippines, confirmed these three components, and added a fourth, viz. social orderliness. This newly identified factor, social orderliness, was related to environmental friendliness, safety, altruism, and quietness, among others. This factor reflected the diversity in culture and social life among Asian countries in which traffic situations of some developing countries seem to be "chaotic" rather than orderly, especially in urban areas, which make them different from those of developed countries. On the whole, those factors reflected how people in Asian countries think about the car versus public transit.

This article is a continuation of the above study by Van and Fujii (2011) in which the symbolic affective, instrumental, and social orderliness factors of attitudes toward the car and public transit were used as explanatory variables for estimating the behavioral intention of commuting mode choices. For each country's data, the analysis was aimed at weighting attitudinal dimensions in terms of their contribution to explaining the future mode choice for commuting trips. The significant determinants were expected to have an effect on future intervention policies, especially on psychological methods for MM.

2. Data

2.1. Participants

The target subjects of the study were first-year engineering students attending universities in six Asian countries, which were selected to include both developed countries (i.e. Japan) and developing countries (i.e. China, Thailand, Indonesia, Vietnam and the Philippines). Those countries have certain similarities in culture, thus this motivates us to explore common and different features in terms of travel behavior. All surveys were administered in late 2005 and early 2006.

Note that students are not necessarily representative of the whole population in each country. However, it was necessary to find some common ground so that results could be compared across all the countries. If the sampling methods were different in each country, differences in the results might be attributable to the sampling methods, rather than to country differences. A survey targeting engineering students was our way of reducing sampling differences across countries.