



Impacts of travellers' social awareness on the intention of bus usage



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ABSTRACT

The literature on psychological studies includes numerous documented efforts to explain traveller behaviour under the pro-environmental approach. However, this approach was found to perform weakly compared to the self-interest approach. A review of the pro-environmental approach showed that the existing pro-environmental models generally discussed travellers' mode-use obligation under a narrow background of environmental awareness. This would probably lead to results showing no difference in mode-use obligation between private vehicles, which have environmental concerns, and public vehicles, which have both social and environmental concerns. In addition, findings of non-mode-choice studies have suggested that awareness of social value would likely be involved in deciding pro-environmental behaviour. As such, it was suggested that social-awareness factors may influence travellers' obligations to transportation modes. However, it was surprising that the literature on mode-use behaviour showed few efforts aimed at the impacts of social-awareness factors on travellers' mode-use behaviour. This study, therefore, provided an examination of the necessity of expanding travellers' mode-use obligations towards social-awareness aspect by considering various social awareness factors in the mode-use model. Empirical results from 333 respondents in Hidaka City, Japan, showed support for the expansion of the travellers' obligations through observation of novel social-awareness factors, including social-awareness of consequences and perceived service interruption, as predictors of bus use intention. © 2015 The Authors. Publishing services by Elsevier Ltd. on behalf of International Association of Traffic and Safety Sciences. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

1. Introduction

The growth of private car use is commonly seen as one of the major causes of environmental concerns and social problems [1]. This led to a focus on transportation policies that seek to reduce private car use by providing other alternatives. Among substitute transportation modes, public transportation was seen as an appropriate alternative to support the policy [2].

The literature on mode-use behaviour studies showed that the psychological approach was a likely alternative compared to the conventional approach. The conventional approach was based on the random utility approach, which has a weakness in terms of describing human behaviour. According to Pronello and Camusso [3], travellers' transportation mode behaviour is not often a result of expected thought. In addition, the theory of individual selection behaviour, which was a basis for the conventional approach, cannot explain all aspects of behaviour [4]. As such, a notion of sustainable development, with

consideration for sociology and psychology, has been concretely examined in transportation studies [5].

Studies pursuing the psychological approach for mode use behaviour identified two main trends. The first trend was based on the self-interest motive and the second on the pro-environmental motive [6]. A typical representation of the self-interest models could be the theory of planned behaviour (TPB) [7]. The models were based on the cost-benefit mechanism to predict traveller choice. Widely known variables in self-interest-motive models include attitude, social norms, perceived behavioural control (PBC) and intention. Researchers based the pro-environmental models on the norm-activation model (NAM) [8] to explain travellers' behaviour. Variables commonly investigated in the NAM model were personal norm, environmental awareness of consequences and environmental awareness of need. In the context of travel mode choice, personal norms were understood as an obligation to use a specific transportation mode.

Comparisons between the self-interest models and pro-environmental models showed the self-interest models to have a better predictive ability. Bamberg & Schmidt [9] investigated the roles of self-interest components and normative-based components in the intention of car use and self-reported car use. Their findings indicated that self-interest-based variables perform better compared with those of the normative-based components. Another study conducted by

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Abrahamse et al. [10] suggested that TPB-based models perform better for car use than NAM-based models. In addition, an integrative review and research agenda by Steg and Vlek [11] suggested that the NAM-based models seem to have weak predictability power in high behavioural cost domains such as travel mode-choice behaviour.

Although a combined approach between the two types of models, which would be a solution to address the weakness of the pro-environmental model, has been pursued by numerous researchers [12–14], such an approach is probably not the only solution capable of improving the performance of the pro-environmental model. It should be noted that the existing pro-environmental models were generally discussed based on travellers' mode-use obligations under a narrow background of environmental awareness. According to that model, researchers assumed travellers' motivations (to use a specific transportation mode) simply originated from their awareness of environmental issues. This would probably lead to results showing no difference in mode-use obligation between private vehicles, which have environmental concerns, and public vehicles, which have both social and environmental concerns. Therefore, an expanded focus which covers either environmental concern or social concern, may help to improve the performance of pro-environmental models.

In addition, findings of non-mode-use studies have suggested that awareness of social value would likely be involved in deciding pro-environmental behaviour. Garling et al. [15] were in agreement with previous studies [16] that considered the involvement of pro-social-value orientation on pro-environmental behaviour. In a notion that social value implies benefits to society, pro-social-value orientation was referred to as a social dilemma in which individuals consider the payoff between acting in self-interest and acting in the interest of the collective. Their findings showed that social value orientation might modify the relationship between pro-environmental behaviour and awareness of environmental consequences. Similarly, Hansla et al. [17] focused on the relationship between awareness of consequences, environmental concerns, and value orientations. Their findings suggested that awareness of consequences for others (not only oneself) was involved in defining pro-environmental behaviour. As to the findings of the discussed studies, it is reasonable to hypothesize that social-awareness factors may play an important role in deciding travellers' mode-use behaviour. Social-awareness defined in this study implies travellers' awareness of social consequences (i.e., mode-use influences on society) and environmental consequences of travel-mode usage.

However, it was surprising that the literature on psychological studies showed few efforts aimed at the impacts of social-awareness factors on travellers' mode-use behaviour. A possible explanation for this is that social-awareness related to transportation was considered to be a different concern. In particular, some previous studies provided findings related to the influence of public transportation on society, such as on the lives of elderly people. For example, Su and Bell [18] examined the travel behaviour of elderly people and found that the use of public transportation and walking increases when driving ability goes down. Similarly, Schmoker et al. [19] reported the dependence of elderly and disabled people on public transportation. In addition, aiming at changing travel behaviour, numerous studies of travel feedback programs (TFPs) conducted by Fujii and colleagues showed significant effects in reducing car use as well as increasing the use of public transport [20,21]. However, the TFPs focus on communicative measures to change travellers' behaviour, thus losing its attention to the diversity of travellers' social awareness which may improve the effectiveness of the TFPs.

Based on the above-mentioned arguments, under the view of the pro-environmental approach, the objective of this study is to provide an examination of the necessity of expanding travellers' mode-use obligations towards social-awareness aspect by considering various social awareness factors in the mode-use model. Due to the social-awareness-seeking purpose of this study, the bus service setting was considered an appropriate context for the investigation. Social-awareness in the context of bus service can be understood as the

awareness of all possible consequences and/or interactions of the service in society and environment. The fundamental argument leading to this definition is that environmental concerns are not the only aspect motivating travellers' obligations to use bus service. There are several aspects that may influence travellers' motivations, such as awareness of giving support to the elderly and/or a responsibility to contribute to the local community.

2. Literature review of mode-use behaviour's determinants

This study applied the conventional approach for considering inclusion of unexplored factors into the mode-use model. This was done to examine the factors under the appearance of a set of widely known determinants. The involvement of these accepted determinants guarantees the independent existence of testing factors as new determinants. Therefore, the impacts of social-awareness factors on intention to use bus service were considered with the involvement of some key intention predictors. As for the notion that intention to use public transportation seems to be more related to the self-interest motive [15], predictors representing the self-interest motive of travellers regarding bus usage were selected for the investigation.

Satisfaction can be seen as a central construct for representing the cost-benefit essence of travellers. The role of satisfaction measures regarding public transportation service was important [22]. As noted by Wen et al. [23], satisfaction is an emotion, a degree of pleasure and contentment, and a distance between performance and expectations in service. The concept of satisfaction makes it close to service quality, thus it is able to capture the self-interest motive of travellers. In addition, because customer satisfaction was defined as a core part of customer affection [24], then it could be seen as an important part of personal attitudes towards the service [25].

The descriptive norm was found to have a significant influence on travellers' behaviour. Inferring from the acquisition of perceived descriptive norms [26], the descriptive norm in the context of bus service can be viewed as people learning from community trends in bus service use and/or from others with whom they are acquainted with through their social network. A meta-analysis by Ravis and Sheeran [27] showed the strength of the descriptive norm-intention relationship with a medium to strong correlation. Another meta-analysis by Manning [28] conducted on 196 studies showed that the descriptive norm was stronger than the injunctive norm of behaviour in the TPB-based model. Regarding the domain of public transportation use, the role of the descriptive norm in bus use has been concretely considered by Health and Gifford [29]. The authors' review work on social norms related to the TPB also showed that the descriptive norm could be a better alternative due to the frequently found weak relationship between the subjective norm and intention.

Perceived behavioural control (PBC) was recognized as one of the key components in the TPB. According to the theory, PBC implies people's perception of the ease or difficulty of performing the behaviour of interest. In the mode-choice context, PBC seems to refer to perceived capacity, for example, the availability of facilities [30]. A meta-analysis by Armitage and Conner [31] found PBC to have a significant impact of on intention and behaviour. Examining 185 studies that contained empirical tests of the TPB, the authors found that PBC significantly contributed to the variance of intention and behaviour. The moderating influence of PBC has also been examined by Castanier et al. [32].

Travellers' habits regarding mode choice have been widely discussed by researchers. Although some studies showed successful results in integrating the construct into the mode-choice model [33,14], caution is still advised when considering the inclusion of the construct in the model. Ouellette and Wood [34] indicated that the strength of the attitude-intention relationship was different between habitual behaviour and non-habitual behaviour. In addition, habitual behaviour probably relates to misperception and selective attention, and thus should only be considered when the context changes significantly

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