# Exploring Social Awareness Factors on Intention of Using Bus Service

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Literature of transportation studies has documented impacts of psychological factors toward decision making process. In the context of bus service, previous studies have found various determinants of user's intention such as satisfaction and descriptive norm. However, despite a consensus on the existence of the aforementioned factors, there has been a little effort exploring impacts of other factors such as users' awareness regarding social contributions of the service. This study aims to investigate the role of some of these factors including environmental issue, elder-people support and recognition of bus provider's efforts on intention toward bus patronage. Moreover, a preliminary examination of a social campaign conducted in this study under leaflet-dropping information regarding these factors was also presented. Results from a sample of 333 respondents in Hidaka city, Japan, showed that people tend to perceive that using bus contributes to environmental protection, supporting elderly people as well as supporting bus providers to enhance bus services. The results also supported for the inclusion of social awareness variables regarding the roles of using bus on environmental protection and elderly people support, as determinants of intention toward bus usage. Although, people tend to understand that using bus would support bus providers to sustain the service, however this factor was not found as a significant variable of intention to use bus. Furthermore, an examination on the impact of a campaign on bus user's intention and related matters revealed that although intention was not significantly different between the group of respondents involved in the campaign and the remaining group, however there was a trend in which intention is increased after respondents getting the additional information. Interestingly, travellers' intention is likely relied more on their beliefs regarding the roles of using bus on solving environmental issues and supporting elderly people after they were trained by provided information.

***Key Words :*** *User Perception, Social Awareness, Bus Service*

## 1. INTRODUCTION

A notion of sustainable development with a consideration toward disciplines of sociology and psychology, has been reported concretely regarding transportation studies (Lyons, 2004). Psychologocial approach were widely accepted by researchers due to its critical arguement that human behavior cannot always be explored through observations or aggregate statistical indicators (Fox, 1995).

The growth of private car use has commonly seen as one of major causes contributing to environmental concerns as well as social problems (Greene and Wegener, 1997). This led to a focus in transport thinking which seeks to reduce private car use by providing other alternatives. Among subsititutive transport modes, publictransport was seen as a sustainable for the mentioned transport policy (Holmgren, 2007).

Aiming to modal switching, literature of trans-

portation studies has documented various impacts of psychological factors toward mode-choice making process (e.g., Colantes and Mokhtarian, 2007; Handy et al., 2005). In the context of bus service, previous studies have found some key determinants of user's intention such as satisfaction (e.g., Lai and Chen, 2011) and descriptive norm (e.g., Health & Gifford, 2002). Those factors were generally considered under a theoretical framework of self-interest approach, which relies on self-interest as an important motive of travelers when making a mode choice (Bamberg and Moser, 2007).

Based on suggestions from the self-interest approach, several efforts for intervention policy have been implemented. Ben-Elia and Ettema (2012) conducted a rush-hour-avoidance experiment using daily rewards (monetary and in-kind) to reduce number of car use. Although the study confirmed impact of the reward for short period of time, it recognized that modal switching is probably controlled by other unrelated factors. Aiming to examine the impact of cost-benefit factors, another interventional policy was reported by Thogersen (2009). A price promotion in a form of a free month travel card showed a positive change in number of trips using public transport. However, the change was not significant, leading the author to a suggestion of a combined solution with other interventional policies.

Parallel with the self-interest approach, there was another trend in which researchers lean on a norm-activation model (NAM, Schwartz, 1977) to explain travelers' behavior. The centre premise of the NAM model was with personal norm that is viewed as a direct determinant of pro-social behavior. Personal norm was defined as feelings of moral obligation to conduct pro-social behavior. According to the model, two antecedences of personal norm were awareness of need and awareness of consequence. Explaining in a context of travel mode choice, personal norm was understood as an environmental obligation of using a subjective transport mode. The obligation is under direct influences of environmental awareness on the consequences and the necessity of using the transport mode (e.g., Hunecke et al., 2001; Klockner and Friedrichsmeier, 2011).

The existence of the pro-social approach, together with the limitations of cost-benefit interventional policies, has apparently suggested a possibility for using environmental and social awareness as a potential tool for modal switching intervention, supplementing for the conventional means. However, regarding the bus service context, studies providing a consideration of the environmental and social intervention for modal switching have been rare.

A further consideration of public transportation studies showed that environmental concern was not the only vital aspect convincing people to travel by bus. Other suggested aspects were identified as elder-people support and recognition of bus providers' efforts to keep operating the service. While a notion of using public transport for elder people was not new (e.g., Su and Bell, 2009; Kim, 2011), a perception of using bus company's community-dedicating image to influence citizen's modal choice, can be seen as an unexplored aspect within the bus service setting. The reason for taking into account the image of bus providers comes from a fact that some governments (including Japanese government) have already decentralized the bus service to private companies. As such, efforts of bus companies to sustain the service, may take an important role in attracting people to become bus users.

In addition, literature of transportation showed that travel information did give an impact toward travellers' modal change. Kenyon and Lyons (2003) examined impacts of different levels of information at different times toward travellers' mode choice. The authors suggested that rich information could persuade travellers for a modal change. Beside, Farag and Lyons (2012) provided an empirical study on impact of pre-trip public transportation information. According to findings of the study, public transportation information was likely very helpful when travellers consider public transport as one of their alternatives, leading to a greater public transport use in certain circumstances.

Taking all the above-discussed issues, this study aims to investigate the role of some of the key factors including environmental issue, elder-people support and recognition of bus provider's efforts (R.o.B's efforts) on intention toward bus usage. Moreover, a preliminary examination of a social campaign conducted in this study under leaflet-dropping information regarding these factors is also presented.

## 2. DATA COLLECTION

A questionnaire survey was conducted in Hidaka city, Saitama Prefecture, Japan. Located in a southern region of the prefecture, the city has an area of 47.5 $km^2$ with around 55,000 habitants (year 2006). The average number of daily bus commuters was approximately 700 people, which is not eligible to get subsidy from Japanese government. Facing with a situation of non-commercial bus routes, the current bus company has showed a significant effort in-

cluding service improvement, annual survey for citizen's need to keep operating the bus service.

Amongst 7500 questionnaire sets sent to residential houses by post, a leaflet with additional information explaining the roles of using bus on environmental protection, elderly-people support as well as supporting bus providers to sustain the services was added in a half the questionnaire sets. For the purpose of this study, the questionnaire included items designed to measure users' perceptions on bus service including satisfaction, descriptive norm, environment awareness, elder people support, recognition of bus provider's efforts and intention as shown in Table 1. For each item, respondents were asked to select one answer ranged from 1 (strongly agree) to 5 (strongly disagree) in Likert-type scale. The number of returned questionnaires was 554 (7.39%). However, because of uncompleted answers, only 333 (4.44%) questionnaires with additional information were used for further analyses.

**Table 1** List of variables measured by the questionnaire survey

| Variable | Item/question | Cronbach's alpha |
|---|---|---|
| Satisfaction | Q1. You are satisfied with the bus service | - |
| Descriptive Norm | Q1. Number of people using bus is increasing nowadays. | .945 |
| | Q2. Most of people you know tend to use bus more nowadays. | |
| Environment Awareness | Q1. Bus is good for environment | - |
| Elderly People Support | Q1. Bus is good for elderly people | - |
| R.o.B's Efforts | Q1. Bus provider showed effort to improve service | - |
| Intention | Q1. Bus is one of priorities for your daily travel | .940 |
| | Q2. You strongly intend to use bus in daily life. | |
| | Q3. The possibility to daily use bus is high. | |

## 3. RESULTS

The sample was divided into two groups: Group 1 included respondents those with no additional formation provided in the questionnaire whereas Group 2 consisted of those with additional information provided. Table 2 shows the results of descriptive statistics of the investigated variables.

**Table 2** Descriptive analysis of the investigated variables

| Construct | Mean | | Standard Deviation | | Independent t-test | | | Mean Difference |
|---|---|---|---|---|---|---|---|---|
| | Group 1 | Group 2 | Group 1 | Group 2 | t | df | Sig. | |
| Satisfaction | 2.461 | 2.530 | 1.150 | 1.037 | -.575 | 331 | .565 | -.069 |
| Descriptive Norm | 3.829 | 3.687 | 1.068 | 1.072 | 1.216 | 331 | .225 | .143 |
| Environment Awareness | 2.090 | 1.922 | 0.856 | 0.794 | 1.858 | 331 | .064 | .168 |
| Elderly People Support | 1.455 | 1.400 | 0.782 | 0.580 | .730 | 306 | .466 | .055 |
| R.o.B's Efforts | 2.232 | 2.177 | 0.948 | 0.959 | .528 | 331 | .598 | .055 |
| Intention | 3.237 | 3.082 | 1.380 | 1.380 | 1.026 | 331 | .306 | .155 |

*Sample size: Group 1: 167; Group 2: 166*

As can be seen in Table 2, on average, both groups gave scores of the three social-awareness variables as higher than the average score of 2.50, which implies that people tend to agree the roles of bus usage on these matters. In addition, although the difference between Group 1 and Group 2 is not significant, the data showed a trend that the mean of intention scores increased when respondents getting additional information.

A regression analysis was conducted to find out the determinants of intention considering satisfaction, descriptive norm and social-awareness related variables. The results of the regression analysis were presented in Table 3. Four models were developed including two for the whole sample and the two others separately for respondent groups with and

without additional information. Model 1 and model 2 were to examine a possibility of considering social awareness factors as determinants of intention to use bus service. Model 3 and model 4 were to explore the impacts of social campain as a tool for intervention aiming to attract more intention of bus patronage.

**Table 3** Regression analysis on intention to use bus service

| Model | Unstandardized coefficients | | Standardized coefficients | t | Sig. | $R^2$ | Adjusted $R^2$ |
|---|---|---|---|---|---|---|---|
| | B | Std. error | Beta | | | | |
| *Model 1: For the whole sample* | | | | | | | |
| (Constant) | .043 | .242 | | .180 | .857 | .354 | .350 |
| Satisfaction | .402 | .057 | .319 | 7.021 | .000 | | |
| Descriptive Norm | .562 | .058 | .436 | 9.614 | .000 | | |
| *Model 2: For the whole sample* | | | | | | | |
| (Constant) | -.333 | .244 | | -1.365 | .173 | .411 | .402 |
| Satisfaction | .329 | .062 | .261 | 5.335 | .000 | | |
| Descriptive Norm | .476 | .059 | .369 | 8.088 | .000 | | |
| Environment Awareness | .289 | .087 | .174 | 3.339 | .001 | | |
| Elderly People Support | .266 | .101 | .133 | 2.644 | .009 | | |
| R.o.B's Efforts. | -.034 | .074 | -.024 | -.462 | .644 | | |
| *Model 3: For Group 1* | | | | | | | |
| (Constant) | -.325 | .343 | | -.948 | .344 | .430 | .412 |
| Satisfaction | .367 | .080 | .306 | 4.607 | .000 | | |
| Descriptive Norm | .522 | .084 | .404 | 6.218 | .000 | | |
| Environment Awareness | .197 | .117 | .122 | 1.677 | .096 | | |
| Elderly People Support | .217 | .126 | .123 | 1.716 | .088 | | |
| R.o.B's Efforts | -.030 | .106 | -.020 | -.281 | .779 | | |
| *Model 4: for Group 2* | | | | | | | |
| (Constant) | -.377 | .357 | | -1.056 | .292 | .401 | .382 |
| Satisfaction | .283 | .099 | .213 | 2.856 | .005 | | |
| Descriptive Norm | .426 | .085 | .331 | 5.035 | .000 | | |
| Environment Awareness | .378 | .131 | .218 | 2.891 | .004 | | |
| Elderly People Support | .372 | .171 | .156 | 2.177 | .031 | | |
| R.o.B's Efforts | -.035 | .107 | -.024 | -.323 | .747 | | |

According to Table 3, the inclusion of social awareness factors increased predictive power of the model. The value of R-square increased from .354 to .411. In addition, the whole sample model (model 2) and the model for participants having additional information (model 4) showed the significant impacts of satisfaction, descriptive norm, environment awareness and elder-people support toward intention. Exceptionally, in the model for peope without information training (model 3), environment awareness and elderly people support were not significant variables. Besides, descriptive norm and satisfaction was realized to be the strongest determinant of intention. Finally, all the models resulted non-significant impacts of R.o.B's efforts toward intention to use bus service.

## 4. DISCUSSION AND CONCLUSIONS

Analysis results showed a positive perception of-travellers toward social awareness factors. People tend to perceive that using bus contributes to environmental protection, supporting elderly people as well as supporting bus providers to enhance bus services.

The present study confirmed the roles of satisfaction and descriptive norm as determinants of users' intention. However, the results also supported for the inclusion of social awareness variables regarding the roles of using bus on environmental protection and elderly people support, as determinants of intention to bus usage. This finding suggests that social campaigns should focus on these factors to increase the number of bus passengers. Future works should pay more attention to impacts of the included factors.

Although, people were positively aware of the efforts of bus providers, however this factor was not found as a significant variable of intention to use bus. This may imply that the efforts of bus providers were not within respondents' consideration when using bus service even they recognize a good attempt from

the agencies.

This study showed a preliminary examination on the impact of a campaign on bus user's intention and related matters. Although, intention was not significantly different between the group of respondents involved in the campaign and the remaining group, there was found a trend in which intention is increased after respondents getting the additional information regarding the roles of using bus on solving some related social problems.

Interestingly, bus users' intention is likely relied more on their beliefs regarding the roles of using bus on solving environmental issues and supporting elderly people after people were trained by provided information. The results may imply that raising awareness about social problems can induce people to adhere with the matters when they decide their transportation mean.

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