

# Study of factors affecting on public intentions and behaviors toward the usage of bicycle-styled electric bicycles in Japan

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## 1. Introduction

Environmental pollution due to motor vehicles has been one of the major problems concerned in today's society. Some studies demonstrate that the CO<sub>2</sub> and other gaseous emissions have been increasing drastically over the past decade by giving a huge impact on global warming<sup>1</sup>. Many studies suggest that electric two-wheelers (E2Ws) may come in handy in order to reduce those harmful emissions<sup>2</sup>. Therefore, this study has mainly focused on bicycle-styled electric bicycle (BSEB), a type of E2Ws, which are believed to be effective in reducing those motor-vehicle related gaseous pollutants. However, the BSEB has not been widespread.

In this study, various factors affecting on people's intentions and behaviors towards an effective usage of BSEBs are investigated mainly. Furthermore, appropriate steps are to be taken on promoting BSEB usage are discussed and revealed at the end of the study.

## 2. Methodology

An online questionnaire survey was conducted at 1032 individuals (owners of BSEB=512, non-owners of BSEB=520) to determine the basic demographic information, and various factors affecting on BSEB owner's satisfaction or non-owner's behavior toward purchasing a BSEB.

Statistical analysis, covariance structure analysis, was conducted by using softwares, SPSS 18.0 and AMOS 19.0.

## 3. Results

Figure 1 shows one of the structural equation models (SEMs) which demonstrates hypothesized relationships between factors, intention and behavior of male non-owners. According to Figure 1, non-owner of BSEB's intention heavily depended on social norms. Considering overall results including Figure 1, entire BSEB owner's satisfaction significantly depended on factors such as cost-effectiveness gained by prioritizing the usage of BSEBs rather than using automobiles and motor-bikes. It also depends on unreliable measures prevailed along with performances of BSEB (i.e. the short battery life lasts only for a distance of 15kilometers) and some personal facts (i.e. person's travel distance per day). Moreover, BSEB owner's satisfaction was not affected by social norms which was developed due to diversified public beliefs around them. On the contrary, non-owner's behavior of purchasing a BSEB was significantly affected by the social norms. In addition to that, variables such as cost-effectiveness and eco-friendliness had significant impacts on non-owner's behavior of purchasing a BSEB. No significant causal relationship was shown between non-user's behavior and unreliability factor.

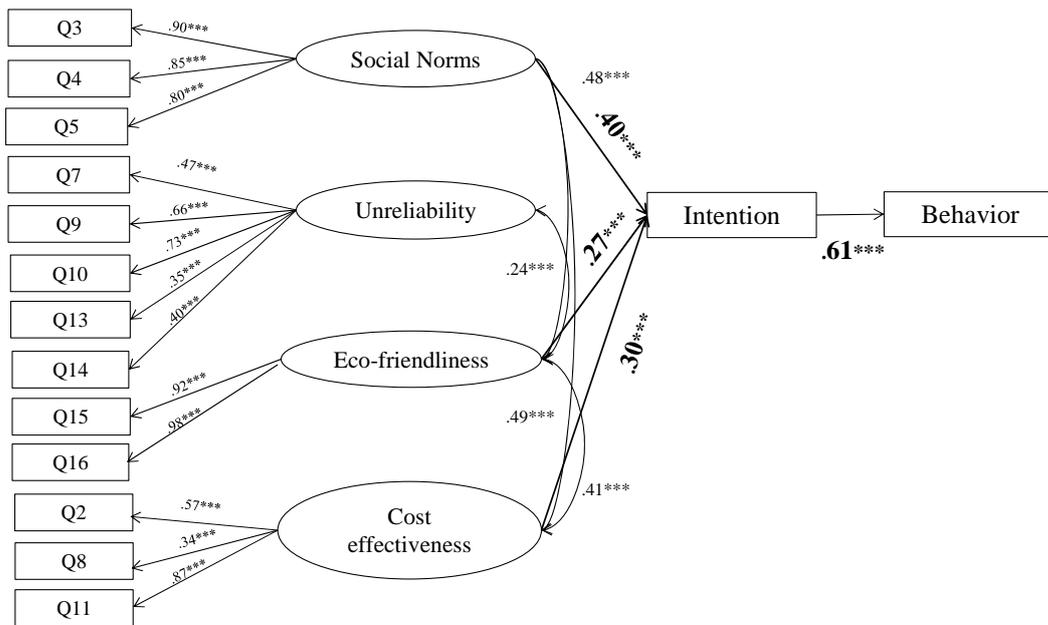


Figure 1. SEM path diagram for male non-owners of BSEB

#### 4. Discussions

The results have important implications that the promoting the BSEB usage can indeed be implemented to a better degree via working on some most-influential factors revealed. Cost-effectiveness has a strong impact on both owner`s satisfaction and non-owner`s behavior to increase the likelihood of using or buying a BSEB. Perception of unreliability is significantly negatively related to owner`s satisfaction which is not a significant measure considering non-owner`s behavior. Furthermore, non-owners who feel that they need to buy BSEBs are more likely to be influenced by social norms around them. Furthermore, male non-users were showing some significant favorable attitudes towards eco-friendliness issues unlike their female counter part.

#### 5. Conclusions

Given the foregoing discussion, the BSEB owners showed some loss of satisfaction regarding the usage of BSEBs, which seemed to be occurred due to various perceptions of unreliability related to BSEBs. It is imaginable that non-owners might also become dissatisfied with their investment over BSEBs as they are not familiar with actual unreliable measures due to arise during the usage. So that, it becomes essential to eliminate various unreliable issues related to BSEB structure and appearance as many as possible. Promoting a good image of BSEBs would also help to create some optimistic attitudes on non-owners of BSEBs who are willing to buy the product, consequently boosting the eco-friendliness as well.

#### 6. References

1. Ristovski, Z. D., Jayaratne, E. R., Morawska, L., Ayoko, G.A., & Lim, M. (2004). PARTICLE AND CARBON DIOXIDE EMISSIONS FROM PASSENGER VEHICLES OPERATING ON UNLEADED PETROL AND LPG FUEL.
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