EVALUATION OF CONSUMERS' DISCRETE CHOICE MODEL FOR SHARING TRANSPORTATION

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ABSTRACT

Sharing economy, as an emerging and efficient product system that transforms the product-oriented consumption to service-oriented consumption, is significant for human society to achieve sustainability. One important practice of sharing economy, sharing transportation, becoming increasingly popular in cities around the world. There are always two types of sharing transportation, shared bikes and shared cars. With a great potential to reduce energy consumption, carbon emission, and problems like traffic congestion, it is highly correlated to Goal 11 (Sustainable Cities and Communities), Goal 13 (Climate Action), Goal 9 (Industry, Innovation, and Infrastructure) ,and Goal 12 (Responsible Consumption and Production) of Sustainable Development Goals (SDGs).

Sharing transportation has been a hot topic for research concerning fields including transportation, energy consumption, behavior pattern and so on. Many previous studies have investigated the environmental impacts, system optimization and of shared bikes and shared cars respectively. Some research also deals with adoption drivers of sharing transportation. However, little research answers clearly how different factors like environmental awareness influence sharing transportation demands. There is also little research integrating shared cars, shared bikes and other traditional means of transportation to see how consumers transfer between them. In

addition, a comparison between different scenarios like the commuting and the shopping scenario or between different cities are also another research gap. This study aims to quantitatively investigate what motivates people of Tokyo and Shanghai to choose sharing transportation over traditional transportation modes including private cars, taxis, and public transportation, in different scenarios, using survey approach.

I conducted a survey in both Tokyo and Shanghai. I asked socio-demographic factors (i.e. age, gender, and income), environmental awareness and health emphasis. And I also used conjoint analysis to collect the behavior pattern data for respondents. For the behavior pattern, I set two scenarios, commuting and shopping to find how people change their choice for different travel purpose. The total respondent number is 518 in Shanghai and 508 in Tokyo. Data were analyzed using different logit models including binary logit, multinomial logit, conditional logit, and nested logit with software Stata 14.0. In both cities, I find environmental awareness promotes people to choose shared bikes when commuting and going shopping and shared cars in the commuting scenario while in the shopping scenario it only has significant impacts of shared cars for Shanghai people. On the other hand, people who are concerned in health are less likely to ride shared bikes in Shanghai due to air quality issues while Tokyo people the opposite. I also find that people will prefer cheap modes in all conditions but only care much about travel time in the commuting scenario when they are in a hurry. Different demographic factors also affect sharing transportation demands in various ways, for example, those without own cars tend to use sharing transportation and younger people are more likely to use sharing transportation in Shanghai.

These results provide us many insights for policy interpretation to enhance the development of sharing transportation. Policy suggestions of this study mainly focus on environment and health benefits education, distribution strategy and economic incentive. It is better to distribute more shared bikes and shared cars around the residence area and terminals in a

suburban area on weekdays. It also recommended to reduce the shared bikes' prices in days when air pollution is severe. Increasing environmental awareness through measures like education would be another solution to increase sharing transportation demands. In the long term, it is necessary to improve the air quality and optimize the infrastructure for shared bikes. For future research, more detail research on the impacts of weather and air quality would make the conclusion of this research clearer.

Keywords: Sharing transportation, Conjoint analysis, Logit model, Environment Awareness