

Comparison of Aberrant Driving Behaviors Amongst Japanese, Chinese, and Vietnamese Drivers

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The incessantly increasing urbanization and motorization are a threat to mobility and the quality of life. Both developed and developing countries have experienced rapid urbanization and economic growth for the last several decades, which were accompanied by increased motorization and increases in road crashes. Concerns about the dangerous consequences of driving have increased enormously in recent years, and so has the attention being paid to traffic safety related to car accidents. Human error is one of the primary reasons for road crashes. Understanding the basic psychology behind the human-road-vehicle interaction while focusing on the behaviors that may increase the risk of road crashes can help policymakers in designing new sets of rules that will ultimately lead to a reduction in the number of road accidents. The study considered Nagoya Metropolitan of Japan, Beijing City of China, and Ho Chi Minh city of Vietnam as the targeted research areas. The data was collected on the socio-demographic factors, driver behaviors, stated preference data on the route choice, and personality traits. The four-factor Driver Behavior Questionnaire was used to collect data on aberrant driving behaviors, while a short version of the 10-item Big Five Inventory was used to collect data on personality traits. Responses were collected from Japan (1250 responses), China (1250), and Vietnam (1000).

This study contributed to the literature and helped policymakers understanding the complex human-road behaviors in the following four areas: 1) To research and understand the cross-cultural differences in aberrant driving behaviors of Japanese, Chinese, and Vietnamese drivers. 2) To understand the influence of big-five personality traits on aberrant driving behaviors of Japanese, Chinese, and Vietnamese Drivers. 3) To evaluate the subjectively reported self- and others' driving behaviors and compare them amongst Japanese, Chinese, and Vietnamese Drivers. 4) Last but not least, to research the driver's route choice behaviors amongst the aforementioned three countries by applying cumulative prospect theory.

In the first section, the study aimed to investigate the basic cross-cultural differences in the aberrant driving behaviors of Japanese, Chinese, and Vietnamese drivers. Overall, the Vietnamese drivers reported more instances of all four types of aberrant behaviors on the road as compared to the drivers from the other two countries. On the contrary, the fewest aggressive violations were reported by the Japanese drivers. An analysis of variance was also performed; the results indicated significant differences in the aberrant driving behaviors of drivers from the three countries. The test statistics indicated there are significant differences between the drivers from the three countries in terms of the Driver Behavior Questionnaire (DBQ) items. Finally, the results of confirmatory factor analysis revealed that the four-factor model structure of the shorter version of the DBQ used in this study was valid for Chinese drivers but only partially valid for Vietnamese and Japanese drivers.

In the second section, the study aims to explore the influence of Big Five personality traits in combination with various socio-demographic factors and experiences of accident involvement on aberrant driving behaviors. The study also compares the effects of the level of development (i.e., developed or developing) of three countries on the personality traits and driving behaviors. A latent variable model was applied after controlling data in each category (e.g., age). This study revealed that respondents who experienced accidents in the past and scored higher on Agreeableness were less likely to commit aggressive violations in Japan, China, and Vietnam. Further, Japanese and Vietnamese female drivers who scored high on Conscientiousness were found to be less likely to commit ordinary violations. Neuroticism was positively correlated with aggressive violations only in the case of Vietnamese drivers, irrespective of the history of accident involvement. Drivers with particular personality types that are linked with aberrant driving behavior may need to receive additional training on behavior management. This study may help road traffic policymakers predict future driving behaviors of Vietnamese and Chinese drivers based on those of Chinese and Japanese drivers, respectively, and act accordingly.

In the third section, the research explored how personal attributes impacted subjectively reported aggressive driving behaviors, with an additional focus on the interinfluences between subjectively reported self and others' aggressive driving behaviors. We employed univariate and bivariate ordered probit models to better understand the response patterns from both scales. While accident experience had the strongest influence on the reporting of aggressive driving behaviors (followed by education level), we also found that both the rate of engagement in aggressive driving behavior and its recognition varied between countries. Here, highly educated Japanese drivers tended to evaluate themselves and others as relatively safe, while less educated Chinese drivers tended to evaluate themselves and others as such. This discrepancy can likely be attributed to cultural norms and values. Meanwhile, evaluations from Vietnamese drivers seemed to differ depending on whether they drove cars or bikes, with additional influences stemming from driving frequency. We also found that it was most difficult to explain the driving behaviors reported by Vietnamese drivers, which may reflect the generally chaotic nature of traffic flow in Vietnam. In sum, these findings should aid policymakers and planners in developing road safety measures that reflect the behaviors of drivers in their respective countries. Lastly, the study focuses on the comparison of route choice behaviors concerning the local road conditions amongst Japanese, Chinese, and Vietnamese drivers. It also highlights the importance of reference points in Cumulative Prospect Theory; different reference points in terms of travel time (longer travel time and shorter travel time) and travel stress level (none travel stress and full travel stress) were investigated. Besides, one of the aberrant driving behaviors, the aggressive violations, was introduced in combination with the stress factor in the study to fully capture the effect of stress on the route choice decisions in all three countries. In all three countries, the 'longer travel time' as a travel time reference point has the highest model fitness while the Japanese and Chinese drivers opted for 'full travel stress level' as a reference point and Vietnamese drivers considered 'none travel stress level' as a reference point of travel stress in their route choice decisions. The study revealed that the travel time and travel stress-related

reference points for the trips to the most commonly taken destination could be different in different countries. The reasons for such differences could be the local road conditions, societal norms, economic conditions, etc. The findings of this study could help the road authorities to integrate the drivers' interest in the new route making or such to lessen the congestion or divert traffic for a smoother flow of traffic on urban roads. The findings also give a direction to future researchers to consider multiple reference points when applying Cumulative Prospect Theory in route choice research.