

報告番号	甲 第 12302 号
------	-------------

主 論 文 の 要 旨

論文題目 **A Study of Older Drivers' Travel
Patterns, Driving Behaviors, and Driving
Stress**
(高齢者の走行パターン、運転行為、及び運
転ストレスに関する研究)

氏 名 趙 延 寧

論 文 内 容 の 要 旨

In the last decades, more researchers began to concern the aging problem in the car society. Many studies reported that physical and mental changes that often come with aging can affect older adult's travel patterns, driving behaviors, and driving stress. Meanwhile, the consequential increase of older driver-related accident has also been an inevitable problem. To improve older adult's driving and decrease their accident rate, there are four objectives in this research: 1) to evaluate the older adult's travel patterns; 2) to evaluate the older adult's driving behaviors; 3) to examine older adults' driving stress; 4) to establish the regression models to confirm the results above and identify the influence factors on older adults' travel patterns, driving behaviors, and driving stress.

First, we analyze older driver's travel patterns which include trip frequency, trip length, destination distribution and non-home-based (NHB) trips. A two-month experiment of 108 participants was carried out to collect GPS tracking data in Aichi Prefecture, Japan. Since apparently contradictory statements were often drawn in survey-based or simulators-based research, this study collects not only drivers' basic information but also GPS data. To identify the effect of living area, comparative analysis between older drivers and others was conducted in densely inhabited district

(DID, i.e. urban) and other areas (non-DID, i.e. suburban, rural), separately. The present study found that there was no significant difference between the trip characteristics of older drivers and others who were living in DID. However, in non-DID, older drivers' trip frequency, trip length, destination and NHB trips rate were shorter and lower than others.

Second, this paper examines older adult's driving behaviors which includes road selection, left/right turn and driving speed. Analysis of road selection demonstrates that older drivers are reluctant to drive on expressway not only in short trips but also in long trips. The present study did not find significant difference between older drivers and others while turning at the intersections. Moreover, the results reflect that older drivers drove even faster than others at particular road types: national road and ordinary municipal road.

Third, older drivers' stress is investigated not only by self-reported data but also by physiological indicators. The analyses were conducted on the conditions of intersections and straight roads, respectively. At first, the results suggest that older drivers reported much less stress than young drivers not only at intersections but also on the straight roads. It seems to support some previous studies which claimed that older drivers tended to overestimate their driving abilities. However, principal components (PCs) of the physiological data demonstrate that older drivers might underrate their driving stress in entire trips, except regarding turning at intersections. While examining whether the stress at intersections could affect their driving behaviors, no significant difference was found between two age groups' turning time. Meanwhile, no difference was found in the driving speed between the two age groups.

Last but not least, regression models of travel patterns, driving behaviors, and driving stress were established in the previous three chapters, respectively. The regression analyses confirmed that age had significant influence (or interaction influences with other variables) on these dependent factors.

Considering the relationships among travel patterns, driving behaviors, driving stress, and accidents, we suggest that 1) the education of safety driving and the recommendation of public transportation should be given to DID-living older drivers; 2) electric vehicles (EVs) may be suitable for promotion among older drivers in non-DID area; 3) relative organizations should provide more driving assistance systems, especially turning assistance system for older drivers; 4) intersection design should be improved for older drivers.