

Analysis of the Operation Process Leading to Pedal Missteps for Elderly Drivers

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The purpose of this study was to investigate the accidents caused by pedal missteps in the elderly. We applied the method of examining missteps by driving simulator in the previous report to the elderly. When the foot position was displaced during braking, the elderly failed to correct, and multiple cases of misstepping were confirmed. Figure 1 shows an example of video capture and DS operation history in which an elderly experimental participant made an actual stepping error.

In this paper, in addition to the data of 12 elderly participants, the data of 12 non-elderly participants obtained in the previous report of the same experimental setting were targeted. We analyzed the relationship between the displacement of the foot position and the stepping motion shown in Figure 2. In addition to the brake operation in the avoidance scenario, the brake operation at the end of the practice run was analyzed as usual. The results for the elderly are shown in Figure 3 (a), and the results for the non-elderly are shown in Figure 3 (b). Excessive foot misalignment was observed in only one non-elderly person in the avoidance scenario, but insufficient movement was observed in the elderly person in the avoidance scenario and in the avoidance scenario and the non-elderly person in normal times. Here, it was patterns A and B that the lateral movement amount was insufficient for both the elderly and non-elderly people, and it was the case of stepping with the heel on the floor when braking. In addition, from the comparison between normal time and avoidance time, both non-elderly people and elderly people often stepped on the heel of pattern C during sudden braking. It was considered that it is not recommended for both elderly and non-elderly people to step on the floor with the heel attached to the floor because the lateral movement of the foot is insufficient when the heel is attached to the floor during braking.

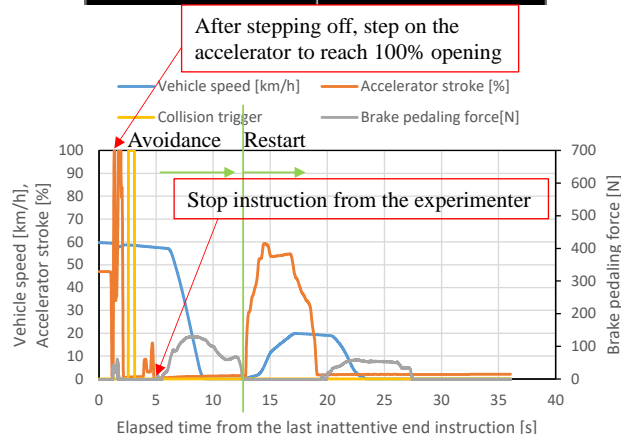


Fig.1 Examples of pedal missteps by an elderly participant

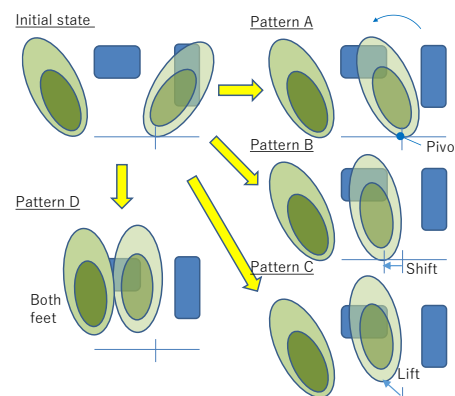


Fig.2 The pedal stepping patterns

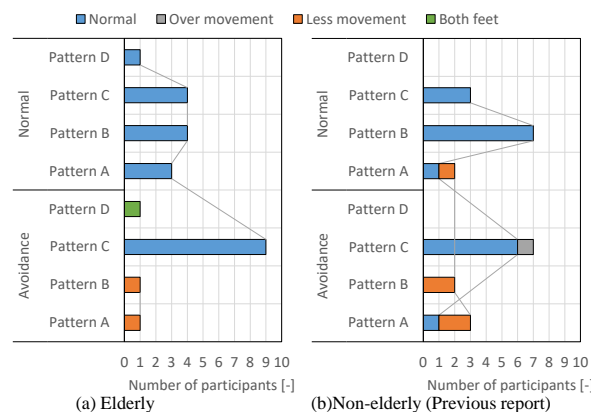


Fig.3 Aggregation result of stepping pattern