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Analysis of Self-evaluation and Traffic Behavior in Traffic Offender Course

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This study examines the effectiveness of a virtual traffic experience-based safety education program and investigates the role of subjective evaluation in behavioral change. Conventional traffic safety education has been shown to improve knowledge and attitudes; however, its effect on actual driving behavior remains limited. One possible explanation is that drivers' behavior is influenced by subjective risk perception, which may not align with objective risk. Therefore, correcting subjective evaluation may contribute to behavioral improvement.

In this study, a virtual environment using a driving simulator was employed to provide participants with simulated hazardous traffic scenarios. Changes in subjective evaluation and driving behavior before and after the training were analyzed. In addition, the relationship between subjective evaluation and behavioral change was examined using hierarchical multiple regression analysis.

First, changes in self-assessment were compared between an experimental group (driving simulator experience combined with KYT) and a control group (KYT only). The results showed that self-assessment scores were significantly lower in the experimental group for right-turning and straight-driving scenarios, suggesting that the virtual experience promoted more critical self-evaluation (Fig.1).

Next, behavioral changes were analyzed using pre–post comparisons of driving performance. Significant improvements were observed in several behavioral indicators, particularly reductions in mean and maximum speeds during straight driving. For right turns, partial improvements were observed, although some indicators showed deterioration(Table1).

Finally, hierarchical regression analysis revealed that individual characteristics alone had limited explanatory power for behavioral change. However, the inclusion of self-assessment significantly improved model performance, as indicated by an increase in the coefficient of determination (R^2). This result suggests that subjective evaluation plays an important mediating role in behavioral change.

These findings suggest that virtual traffic experience can promote behavioral improvement by correcting subjective evaluation. The results highlight the importance of considering cognitive factors, such as self-assessment, in traffic safety education.

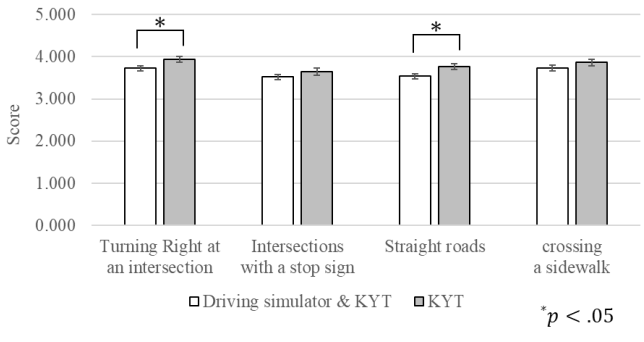

Fig. 1 Means of the scores for self-assessments. Driving simulator & KYT and KYT groups. Error bars indicate the standard errors.

Table 1 Results of the Pre–Post Mean Difference Test

Behavioral Features	N	Mean Pre	Mean Post	TestType	pValue	Cohens d
Distance from intersection center [m]	99	3.646	3.591	ttest	0.469	-0.073
Mean speed (intersection) [m/s]	99	2.205	2.082	signrank	0.079†	-0.151
Max speed (intersection) [m/s]	99	5.663	5.958	ttest	0.009**	0.269
Mean speed (straight) [m/s]	99	9.520	8.566	ttest	0.000***	-0.490
Max speed (straight) [m/s]	99	13.033	12.574	ttest	0.022*	-0.234

$^{\dagger}p < .1$, $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$