Driver Performance Measurement Research

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In a 2½-year research project, a reliable method was developed to measure driver performance. The method is applicable to individuals and small groups and gives immediate results.

An approach that combined measurement and content validity was used (3, 5). A procedure was developed by which specially trained observer-raters with backgrounds in driver education, traffic, and psychology made observations of drivers in actual traffic situations. Two observers rode with the driver over a standardized course and rated his or her driving performance in 3 successive circuits or "runs" requiring about 1½ hours.

Six behavioral environmental traffic situational sequences (BETSS) were developed that were representative of urban, suburban, and freeway traffic. The BETSS included driving tasks and behavior observed at selected locations and carefully described with regard to traffic and location characteristics. Two observers gave each subject 3 ratings on performance in each BETSS on each of the 3 runs.

Ratings were on the suitability or unsuitability (tending to reduce or increase hazard) of the observed driving behavior in relation to the requirements of each BETSS and sub-BETSS. In addition, search, speed control, and direction control were also rated.

Subjects were high school students who had just completed driver education or undergraduate college students who had had such a course previously.

The authors are associated with the Department of Psychology and Highway Traffic Safety Center, Michigan State University, East Lansing. This is a brief summary of a paper presented at an informal meeting of the Committee on Road User Characteristics at the Highway Research Board Annual Meeting, January 21, 1974.

Analysis of Results

Quantitative and qualitative results were obtained. Quantitative scores were submitted to analysis of variance and correlational statistical analysis, which showed high between-rater correlations and within-rater reliabilities. Effects of training and of discussions by trainee observers were indicated.

Mean unsuitable scores (averaged over runs) discriminated well among drivers, ranging from 0 to 9.5 for total pattern scores and from 2.5 to 26.5 for element scores. Reliabilities ranged from 0.88 to 0.96 between raters after training and from 0.84 to 0.97 within raters in studies with 3 groups of trained observers.

Qualitative results were derived from descriptive information in notes of observers. Behavior that both decreased and increased potential hazard was observed.

Conclusions

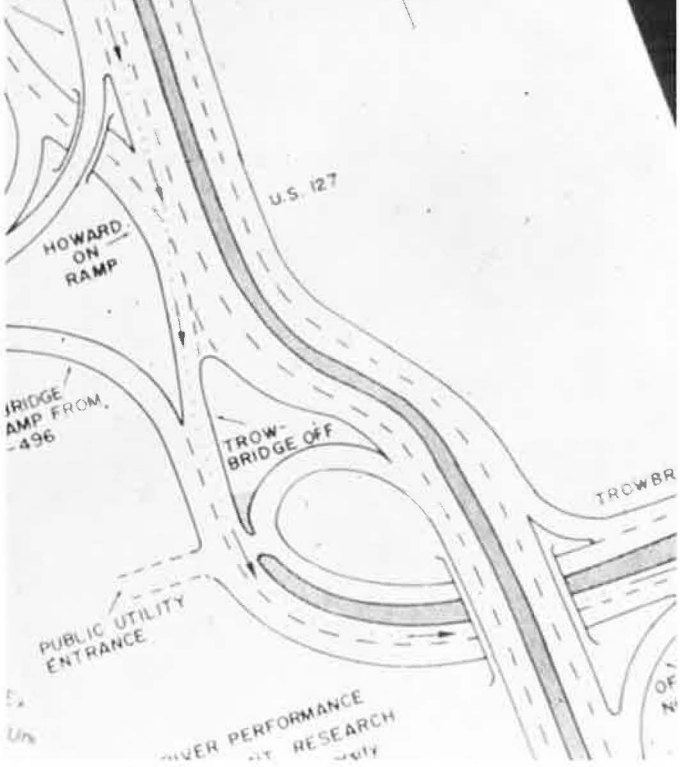
The driver performance measurement procedure showed high inter- and intra-observer agreement, reliability, and content validity. However, valid and reliable results can be expected only if the method is properly used by specially trained observer-raters who have suitable background and experience.

Case descriptions yielded clues on possible causes of accidents where a subject was saved from his or her own potentially hazardous driving behavior by the actions of another driver. Such near accidents would not appear in accident records.

Case descriptions indicated that some drivers had learned unsafe habits within 2 or 3 years after finishing driver education. This confirms results of studies indicating poorer driving records for some second-year drivers (2).

The procedure yields immediate results that can be used to measure performance of individuals and small groups. It is applicable in research to improve driver education, driver licensing, and similar problems by comparison of small groups. The method furnishes an approach to research on safe driving when the mass accident record approach with very large populations may not be practical or valid.

The 2 volumes of the final report are available (1, 4).



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1 Typical location diagrams for Behavioral Environmental Traffic Situational Sequences.

2 Two observers monitor the activities of the subject driver.

3 A driver's view of the traffic pattern approaching one of the Behavioral Environmental Traffic Situational Sequences.

References

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