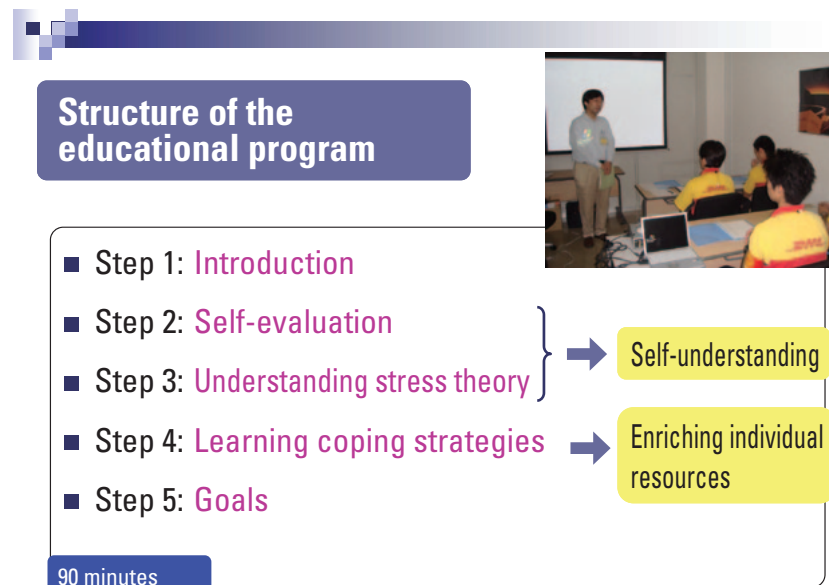# An educational program for better control of emotions while driving

1. Background and goals

Negative emotions such as irritation, impatience, and anger have been frequently indicated as causal factors in accidents in various studies on human factors. However, this issue tends to be treated as an inattention error by the driver or as a legal violation, and is rarely directly taken up as an educational theme. In this study, we address this issue as a topic for driver education. The goal of the project was to develop an educational program for better control of emotions and examine the effectiveness of the program (Fig. 1).

Figure 1. Overview of the educational program

Emotional control is one of the most important skills required for safe driving and plays a dominant role in other safe driving skills such as vehicle maneuvering and hazard perception according to a hierarchical model of driver behavior. However, it is difficult for a third party to determine what should be learned in an educational program because emotional control skills are highly dependent on individual characteristics. The most important pedagogical point is to help learners understand their own emotional tendencies and to proactively develop emotional control strategies best suited to the individual. This project aimed at providing opportunities for such learning, by developing an educational program for improving emotional control skills.

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2. Research content

2-1. Methods

The research project consisted of two surveys. The participants in the surveys were 102 professional drivers (average age 37.38 years) employed by transport and delivery service companies. The first survey was conducted before and after implementation of the educational program to analyze changes in driving behavior using driving recorders attached to vehicles that the participants operated during daily work. We also measured changes in participants' awareness (stress reaction and feelings of self-efficacy) before and after the program. We also conducted simple interviews one month after the program to investigate awareness changes following program participation. The second survey investigated only changes in awareness before and after participation in the educational program.

We used three questionnaires. Questionnaire I presented examples of emotional states during driving, and the degree to which the participant thought the emotion applied was taken as a measure of stress reaction (Fig. 2). We also asked participants to rate whether they have been able to easily cope with their emotional state, and used this as a measure of self-efficacy.

Questionnaire II was for evaluating the educational program. This questionnaire was used to identify which parts of the program participants found

Figure 2. Part of questionnaire I

useful and to get information about their overall impressions regarding the program. We used the results of this questionnaire to evaluate acceptance of the educational program.

Questionnaire III was produced based on the Big Five theory[1] and was used to assess the personality traits of the participants.

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(1) A recent theory for explaining personality. This theory categorizes the various personality traits into five dimensions: extroversion, neuroticism, openness to experience, conscientiousness, and agreeableness.

2-2. Results

(1) Changes in stress reaction and self-efficacy

We calculated a scaling score for eight items of questionnaire I regarding anger toward others' behavior. We converted this to average per-item scores and analyzed changes after participation in the educational program. Higher scores indicate a stronger stress reaction and stronger feelings of self-efficacy. As shown in Figure 3, stress reaction was reduced after program participation and feelings of self-efficacy were improved.

Figure 3. Changes in stress reaction and self-efficacy following education

A similar analysis was performed on five items related to feeling rushed under the pressure of time, and rating scores were compared before and after program participation. For impatience, we also found effects of reduced stress reaction and increased feelings of self-efficacy after the program.

Analyzing the relation between age and changes in awareness indicated that age in particular was a factor that influenced feelings of impatience after the program. Both young participants (aged 30 years or younger) and middle-aged participants (aged 31 years or older) indicated reduced stress reaction and improved feelings of self-efficacy after the program, but the change was greater for the young participants.

Analysis of the relationship between changes in awareness and personality traits of the participants indicated no association with stress reaction. Regarding feelings of self-efficacy, however, a significant interaction was found between feelings of anger and extroversion. We divided participants into two groups of higher and lower extroversion scores. We found that changes in feelings of self-efficacy were larger among the participants with higher extroversion scores. In other words, it was suggested that participants who tend to direct mental energy outward found it easier to cope with their anger toward other road users after the program.

(2) Participants' evaluation of the educational program

Questionnaire II contained 17 question items posed as a 4-point Likert scale. Participants evaluated the program favorably: Over 80% of participants gave positive responses ("4: Agree" or "3: Somewhat agree") for all question items.

(3) Changes in driving behavior

No statistically significant changes were found regarding driving behavior of the participants following the program.

3. Conclusions

Participation in the educational program resulted in reduced stress reaction regarding feelings of anger and impatience. Such changes in awareness were particularly noticeable among young drivers. Also, highly extroverted drivers showed particular improvement in feelings of self-efficacy to control anger. Evaluation of the education program indicated high acceptance overall. However, no definite changes in driving behavior were observed.

In the future, it will be necessary to develop more sensitive measurement indicators for changes in driving behavior. A possible measurement method is to observe specific behaviors such as visual checking and stopping at an intersection when a stressful event occurs on the road. Another problem to be solved is the development of follow-up training to sustain the improvement in emotional control skills. It is possible that the educational effects found in this study are only temporary changes. Finally, dissemination of this emotional control educational program requires development of a manual. We hope to develop specific educational measures for organizing and resolving the many psychological problems that drivers face.

4. Future outlook

In addition to continued verification of the educational effects, instructor training is a major issue related to dissemination of this educational program. Traditional educational styles in which instructors attempt to instill knowledge in learners are not suited to deriving self-understanding. In the future, it will be necessary to plan instructor training workshops that provide learner-oriented instructional methods such as coaching techniques.