

Effectiveness of the Temporary Stop To See (TSTS) campaign: Considerations from the Accident Cause Concepts

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We developed the Temporary Stop To See (TSTS) campaign (Nagatsuka,1991). Japanese drivers regard “speeding” and “drinking” as most frequent causes of accidents statistically in spite of the fact that the main cause of accidents is “perceptual failures.” To reduce accidents, drivers’ behavior on the road must be changed, for which their “safety consciousness” (the Accident Cause Concept: ACC) must be changed into the factual one according to Koffka’s (1935) advocacy that human behavior is determined by his/her perception of situation. It is extremely important for road users to have the factual ACC to be able to perform a temporary stop which is considered as a prerequisite to a proper lookout. The campaign has been conducted annually. Effectiveness of the campaign was evaluated by using a questionnaire in which participants were asked to select three violations in the order of dangerousness. The results shows that failure to confirm safety was rated as more dangerous violations in the later campaigns than in the earlier ones, suggesting that the TSTS campaign succeeded to convert biased ACC into unbiased one. This change of ACC, i.e., an improvement of safety consciousness, is expected to improve traffic behaviors and to decrease traffic accidents.

Key words: Effectiveness, TSTS campaign, Accident Cause Concept (ACC)

Problem

Temporary Stop To See (TSTS) campaign was developed by the present author (Nagatsuka, 1991). We believe that in order to prevent traffic accidents, we must first of all improve drivers’ behavior. To change drivers’ behavior, we must change their safety consciousness, which we call Accident Cause Concept (ACC). It is necessary to change the biased ACC into the factual one because human behavior is determined by his/her cognition of situation, as Koffka (1935) advocated. It is extremely important for road users to have the factual ACC to perform a temporary stop which is prerequisite to have a proper lookout. The campaign has been conducted continually aiming at preventing traffic accidents by improving problem behavior such as improper lookout to proper one (Figure 1).

As other researchers of traffic psychology are, we have pursued the eradication of accidents on the road. The most frequent causes of traffic accident in Japan are perceptual failures, i.e., insufficient perceptions of the surroundings. Regardless of the fact, most safety campaigns in Japan have placed special emphases on the preventions of speeding and drunk driving. As a result, Japanese drivers have a biased concept of accidents in that the ACC of

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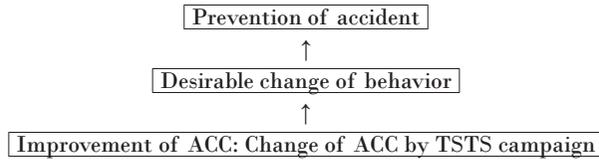


Figure 1. Relationships of behavior and ACC. TSTS campaign influences the cognition of accident cause. Drivers try to judge whether their cognition are right or wrong. They behave according to their judgement, i.e, their improved cognition on the accident cause.

drivers is not factual. It is of crucial importance that driver's behavior may be erroneously influenced by the unbiased ACC.

We believe it important to take notice of direct human causes that lead to collisions, that is, problem behaviors in driving (behaviors that immediately precede accidents). Shinar (1978, 2007) emphasized that drivers' looking and attending should be improved in order to eliminate improper lookout, that is, the error of "looked but failed to see" (LBFTS) or "failed to look." Based on the idea, we proposed a "Temporary Stop To See (TSTS) campaign." The purpose of the campaign was to ensure looking and attending on the part of drivers by converting drivers' biased ACC into the unbiased (factual) ACC.

Methodologically a unique characteristic of our campaign is to facilitate "pondering," but not to indoctrination. In the campaign, we made drivers ponder (made them to consider carefully and deeply without conveying them the fact of statistics of accidents) why several traffic matters are necessary. It was hypothesized that the formation of the factual ACC will motivate drivers to perform a temporary stop, which was considered as essentially prerequisite to an effective perception of the surroundings. Through the campaign activities, the factual ACC was formed and desirable driving behavior was developed. As a result, traffic accidents have been reduced in several transportation companies (Nagatsuka, 1991).

The most frequent causes of accidents on the road in Japan are perceptual failures, such as looking aside while driving and failure to observe surrounding traffic movements. Regardless of this state of affairs, Japanese drivers have been long suffered of incorrect concepts of accident cause (the biased ACC), believing traffic accidents are primarily caused by speeding and/or drunken driving. Accordingly, most Japanese drivers tended to focus on avoiding speeding and/or drunken driving, without paying attention to perceptual failures, resulting in a remarkable increase of accidents caused by perceptual failures.

In this circumstances, it is earnestly necessary to motivate drivers to change their ACC into one that recognizes that perceptual failures is the most frequent cause of accident in Japan, but not speeding or drunken drinking. We assume that in order to modify drivers' behavior, first of all, their ACC must be changed because human behavior is influenced by the perception of situations, that is, "behavioral environment" as advocated by Koffka (1935).

As an effective way of ensuring proper lookout on the part of driver, we proposed a campaign named “Temporary Stop To See (TSTS) campaign” (Nagatsuka, 1991). This is a major campaign to motivate drivers to take every opportunity to participate, experience, and practice by making a firm and temporary stop at every intersection to ensure proper observation (lookout).

The purpose of the present study was to examine the effects of TSTS campaign, which makes drivers learn the factual ACC, by measuring the changes in their ACC. The campaign was conducted in 2011, 2012, 2014 and 2015 in Japan. Assuming that the factual ACC has been spread among drivers in general through the repeated campaign, we predicted that the drivers who participated in the later campaign would show more objective ACC than that those in the earlier campaign. The campaign was conducted on the proposition that it is crucial to make drivers form the “unbiased” accident cause concepts (ACC) in order to successfully motivate them to perform temporary stop. In other words, drivers must recognize that the problem behavior causing accidents and, therefore, what should be eliminated is the perceptual failure and a failure to stop temporarily. At the beginning of campaign, drivers were informed of the facts of frequent occurrence of accidents and then were induced to ponder on the causes of these accidents, in other words, the kinds of worst violations to be removed from the road.

Method

Participants

A total of 1017 individuals participated in the campaign conducted in 2011, 2012, 2014, and 2015 in public halls, conference rooms, and meeting rooms with about 150 participants per one lecture. Most of the participants were professional drivers, mostly truck or taxi drivers, administrators of transportation companies, and staff members of the related private companies and official organizations.

Procedures

We conducted the TSTS campaign in accordance with the syllabus shown in Table 1. We attempted to form the factual ACC of the participants to motivate them to perform a temporary stop, which was considered an essential prerequisite to the effective perception of surroundings. Improved changes of ACC were measured by a questionnaire that we developed. The questionnaire was consisted of fifteen items of violations on the road. The participants were asked to select three violations in the order of seriousness.

Through the session using the syllabus, we attempted to shape the factual ACC in the participants with an expectation to motivate them to perform a temporary stop, which is assumed an essential prerequisite to the effective perception of surroundings. In order to examine the effects of TSTS campaign, changes of the ACC of participants were measured by the questionnaire in which participants were asked to choose three from the following list of 15 traffic violations that they thought most risky in order: disregarding signal, drunken driving, speeding, failure to observe traffic movement, failure to temporary stop at the crossing, and etc.

Table 1. Syllabus of the TSTS campaign that provides participants with factual information and materials to make them ponder and discuss on accident causes.

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- 1 First of all we inform the participants of the actual conditions of traffic accidents. They learn the factual circumstances of accidents and the fact that the incidence of accidents on the road is considerably high in Japan.
 - 2 We ask the participants to answer the question, “What do you think are the most frequent cause of the accident?” by selecting three worst violations in the order of seriousness.
 - 3 We encourage the participants to ponder the causes of accidents with special reference to their own routine driving. As results of pondering on their own driving experience and several graphical materials given in the lecture, we induce them to realize that the most frequent cause of accidents was perceptual failure.
 - 4 Here we ask the participants, “What do you think is the most effective method of suppressing perceptual failure?”
 - 5 Most participants may answer that looking carefully and observing precisely are the effective method.
 - 6 We ask the participants again, “What do you mean by “carefully” and “precisely,” requiring them to explain more concretely.
 - 7 In this stage we give the participants a lecture on the limit of human perception by referencing to the figures of illusion as well as misperception under instantaneous perception (tachistoscopic vision) and peripheral vision, and so on.
 - 8 Then the participants are told that people look but often do not see. To see, people must both look and attend (Shinar, 1987, 2007).
 - 9 We explain the participants that it needs a sufficient time for people to look and be attentive.
 - 10 Here we ask them, “How to achieve this?”
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Results and Discussions

We gave score 3 to a violation if it was rated as the most risky, score 2 was to that if it was the second most risky, and score 1 was to that if it was first most risky. The violations were rank ordered according to the scores. Table 2 shows that disregarding of signal or speeding were selected as the worst violations in 2011 and 2012, while the order of violations was changed in later campaigns, that is, failure to confirm safety was ranked as most risky in 2014 and 2015. From the changes in the rating of seriousness of violations, we conjectured that the TSTS campaign conducted following the syllabus in Table 1 improved participants’ ACC as more unbiased and more objective.

After the TSTS campaign of four years, the violations of failure to confirm safety and/or disregarding signals were ranked high as the worst problematic behavior. From these changes in the evaluations of the seriousness of violations, we argue that the TSTS campaign conducted following the syllabus in Table 1 effectively modified the biased ACC of the participants into the unbiased one. This change of ACC, i.e., an improvement of safety consciousness, may lead to more appropriate traffic behaviors and so to a decrease of traffic

Table 2. A rank order of violations in each year according to the degree of risk.

(a) 2011		
Rank	Violations	Scores
1	Disregarding of signal	1.41
2	Speeding	0.98
3	Failure to temporary stop	0.91
4	Failure to confirm safety	0.79
5	Drunken driving	0.34
(b) 2012		
Rank	Violations	Scores
1	Speeding	1.54
2	Failure to confirm safety	1.19
3	Disregarding of signal	0.75
4	Failure to observe traffic movement	0.66
5	Drunken driving	0.44
(c) 2014		
Rank	Violations	Scores
1	Failure to confirm safety	1.21
2	Speeding	0.97
3	Disregarding of signal	0.95
4	F to observe traffic movement	0.73
5	Drunken driving	0.52
(d) 2015		
Rank	Violations	Scores
1	Failure to confirm safety	1.83
2	Drunken driving	1.35
3	F to observe traffic movement	0.60
4	F to temporary stop	0.57
5	Disregarding signal	0.29

accidents, as suggested by Koffka's proposition.

Brown (2003) wrote that in an on-the-spot survey of accident causation in the UK, "looked but failed to see" (LBFTS) was ranked third in order of importance as risk factor, following after lack of care and driving too fast. A re-analysis of these data indicated that LBFTS was involved in almost half of all perceptual errors, being far more important than distraction, lack of attention, or alertness. The problem is seen to be important and researchable. Shinar (1978, 2007) wrote that improper lookout was the most frequent cause of accidents identified by the Indiana University study. Most of these errors (74 percents) occurred at intersections. A more detailed analysis revealed that drivers "looked but did not see" just as often as they failed to look. Thus, merely scanning the visual field does not guarantee seeing. To see, the drivers must both look and attend. These errors were described as LBFTS by Cairney and Catchpole (1996), Herslund and Jorgensen (2003), and Hills (1980), Brown (2003) repeated a careful

review of the LBFTS. Considering that LBFTS and improper lookout have a lot in common with perceptual failures in that they demonstrate the importance of flawless observation, a temporary stop to see campaign may be a workable solution to them.

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(Received July 9, 2015)

(Accepted October 23, 2015)