

COGNITIVE BEHAVIOR THERAPY COMPARE TO CAMPAIGN ADVERTISEMENT PROGRAMS IN REDUCING AGGRESSIVE DRIVING BEHAVIOR

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Abstract

This study was conducted to examine the effectiveness of three intervention programs, i.e. CBT (Cognitive Behavior Therapy), humor appeal advertisements (positive ads), and fear appeal advertisements (negative ads) in reducing aggressive driving behavior. 196 young adults age between 18–35 years old, who are considered to be at risk in performing aggressive driving behavior had completed four self report inventories. The four inventories measures perception on traffic conditions, degree of frustration, anger emotion, and driving behavior. Analysis of mix factorial design shows that CBT intervention program is more effective than the advertising intervention program, particularly in reducing the degree of frustration and emotional upset. However, no significant difference between humor appeal and fear appeal advertisements in reducing the level of frustration and anger emotion. Moreover, CBT program as well as the other two advertising intervention programs is not sufficient enough to reduce driving behavior. Based on the A-B-C Theory of Emotonal Arousal proposed by Ellis, this result indicates that safety driving behavior (factor C) among young drivers cannot be achieved through these intervention programs, although their belief and emotion (factor B) has been changed. This study implies that other modification behavior technique, i.e. strong penalty from the author (police) is needed to encourage safer driving behavior of Indonesian young driver.

Efektivitas Program *Cognitive Behavior Therapy* Dibandingkan Program Kampanye Iklan dalam Menurunkan Perilaku Mengemudi Secara Agresif

Abstrak

Penelitian ini bertujuan untuk menguji efektivitas tiga jenis program intervensi, yaitu *Cognitive Behavior Therapy* (CBT), iklan dengan tampilan humor (iklan positif), dan iklan dengan tampilan menakutkan (iklan negatif) dalam menurunkan perilaku mengemudi secara agresif. Partisipan terdiri atas 196 pengemudi yang tergolong dalam kelompok usia dewasa muda (usia 18–35 tahun), yaitu usia dimana individu berisiko untuk menampilkan perilaku mengemudi secara agresif. Kepada partisipan dilakukan pengukuran dengan menggunakan empat macam inventori lapor diri, yaitu inventori untuk mengukur persepsi mengenai kondisi lalu lintas, derajat frustrasi, emosi marah, dan perilaku mengemudi. Analisis dengan menggunakan desain mix-faktorial menunjukkan bahwa program intervensi CBT lebih efektif dibandingkan program intervensi iklan, khususnya dalam menurunkan derajat frustrasi dan emosi marah. Sedangkan antara iklan dengan tampilan humor dan iklan dengan tampilan menakutkan tidak ditemukan adanya perbedaan yang signifikan dalam menurunkan derajat frustrasi dan emosi marah. Baik program CBT maupun kedua jenis program intervensi iklan tidak cukup efektif untuk menurunkan perilaku mengemudi secara agresif. Mengacu pada Teori A-B-C tentang ketergugahan emosi yang dikemukakan oleh Ellis, maka hasil penelitian ini menunjukkan bahwa sasaran akhir yaitu perilaku mengemudi secara aman (faktor C) pada pengemudi usia dewasa muda tidak dapat tercapai walaupun keyakinan dan emosi mereka (faktor B) berhasil diubah menjadi lebih positif. Implikasi dari penelitian ini adalah bahwa untuk sampai terjadinya perubahan perilaku mengemudi secara aman diperlukan teknik modifikasi perilaku yang lain, misalnya pemberian sanksi yang kuat dari pihak otoritas yaitu polisi.

Keywords: aggressive driving behavior, CBT (Cognitive Behavior Therapy), fear appeal advertisement, humor appeal advertisement, young adult driver

1. Introduction

A high vehicle density in Jakarta has created difficult situations for drivers, such as traffic jam and indiscipline driving behavior. These situations could influence the drivers to feel stressed and frustrated, especially when they are in a hurry, which in turn could be followed by aggressive driving behavior (Fajen and Devaney, 2006). As observed in Jakarta and other big cities in Indonesia, most of the drivers commit red-light running behavior, speeding offences when they are escaping from the traffic jam, tailgating (being very closed to other vehicle in front of or beside their own vehicle), passing lane improperly, or honking repeatedly. Falk and Montgomery (2007) classified those behaviors as aggressive driving behavior, which is defined as a driving behavior that intentionally tends to increase the risk of accident, or to influence other drivers, which is motivated by a lack of patience.

Shope (2006) suggested that driving behavior is influenced by many factors. In general, factors that affect driving behavior can be classified into two main factors, namely internal factors or factors originating from within the driver, and external factors or factors originating from the environment. Some of the internal factors are driving skills, personality characteristics, demographic, perceptions on the driving environment, and developmental factors, including cognitive and affective aspects; whereas the external factors are environmental conditions, both physical and social environment. Both internal and external factors interact to influence driving behavior. However, according to the statistics of accidents in Indonesia, it can be said that internal factors have a bigger role in determining driving behavior than external factors. The statistics in Indonesia in 2004 showed that nearly 30,000 lives were lost every year due to traffic accidents, which are mostly caused by human error (http://honda-owners.blogspot.com/2008_04_01_archive.html cited 23 January 2009). According to Tasca (2005), the highest risk of accidents occur in young adults drivers aged 18-35 years because they are easily provoked and emotionally distracted by things around them (Badger, 2002). Besides, young drivers tend to judge dangerous situations as low risk, to have deficits in identifying potential risks on the road (Fergusson *et al.*, 2003), to be easily distracted by conversation (Papalia *et al.*, 2004; Badger, 2002), and to violate traffic light and stop sign (Shope, 2006).

From the perspective of Social Cognitive Behavior, driving behavior is based on individual's cognitive and affective component. Driving behavior is largely determined by how the driver focus on the various stimuli received from the environment, how they process the information in their mind (Groeger, 2002), and how they control their emotions (Fajen and Devaney, 2006). Specifically, Fajen and Devaney

(2006) stated that aggressive driving behavior can be triggered by emotional conditions, such as stress and level of frustration, or anger emotion (Deffenbacher *et al.*, 2002; Iverson and Rundmo, 2002) while driving in an uncomfortable situation. On the other hand, if drivers are in the normal emotional state, they will be able to manage anger more effectively. This state helps drivers to be able to make decision more effectively so that they can avoid aggressive driving behavior, or avoid becoming a victim of others' aggressive driving (Falk and Montgomery, 2007), as well as decrease accident risk (Garrity and Demmick, 2001).

The drivers' internal control becomes a very important factor in detaining aggressive driving behavior. A good or normal emotional state should be maintained while driving so that the driver can determine strategy and tactics to display a safe driving behavior. One of the efforts that have been made to control driving behavior on the road is to create an environmental stimulus, i.e displaying advertisements. Two types of advertisements that are used to lure drivers to display safe driving behavior are advertisements that evoke negative emotions (fear emotion), such as displaying pictures of car accident victims, and advertisements that evoke positive emotions (cheerful emotion), such as advertisement that shows a picture of a child/family who are waiting for the driver at home. However, in Indonesia, as in other countries like Australia and New Zealand, negative advertising appeals are more widely used than the humorous advertising appeals. This phenomena provokes the question — is negative advertising appeal more effective in influencing drivers' thought, affect, and behavior compared to positive advertising appeal? Actually, some studies conducted on driving behavior have not yet obtained a definite conclusion on which advertisement is more effective in reducing aggressive driving behavior (Lewis, Watson, White, & Tay, 2008). Therefore, this study attempted to find the answer.

Another approach aiming to change aggressive driving behavior to safe driving behavior, which is also based on the perspective of Social Cognitive Behavior, is Cognitive Behavior Therapy (CBT). Beck and Fernandez (cited in Westbrook, Kennerly, & Kirk, 2007) found that CBT is an effective form of treatment for issues related to anger. Therefore, this study also aimed to investigate the effectiveness of CBT as an intervention program on reducing aggressive driving behavior.

Cognitive approach to changing aggressive driving behavior into safe driving behavior. Studies in traffic psychology showed that aggressive driving behavior are influenced by emotions (Deffenbacher *et al.*, 2002; Galovski *et al.*, 2003). The A-B-C Theory of Emotional Arousal proposed by Ellis (Mullin, 2000) is assumed to

be able to explain the mechanism of aggressive driving behavior (Fig. 1).

The A-B-C Theory of Emotional Arousal states that emotional reactions and human behavior (C) toward a situation or event (A) are influenced by their beliefs or thoughts in regards to such situation or event (B). It is assumed that individuals' reactions toward an event will vary depending on their interpretation of the situation and individuals' perception, which are based on their belief, hope, and attitude. These cognitive aspects have important roles in mediating the individuals' interpretation of the situation and their emotions and behavior. In terms of the uncomfortable traffic condition in Jakarta, drivers' perception, belief, attitude, and expectation on traffic condition they face will trigger negative emotion, such as anger, which then will be followed by aggressive driving behavior. Referring to the A-B-C theory, the modification of certain behavior can be done through their thoughts (Martin & Pear, 2007).

Based on Martin and Pear's point of view (2007), this study was conducted to change aggressive driving behavior into safe driving behavior by modifying the drivers' cognition through intervention programs. Two types of intervention programs that will be applied in this study are Cognitive Behavior Therapy (CBT) and advertisement, i.e. negative and positive advertising appeals. In CBT intervention program, drivers are guided to recognize the potential dangers caused by aggressive driving behavior, and to understand the way to alter their unrealistic thoughts into realistic ones. Individuals are guided to recognize and interpret the uncomfortable traffic situations they encounter and the negative feelings resulting from this situation, and then are asked to change their negative thoughts into more

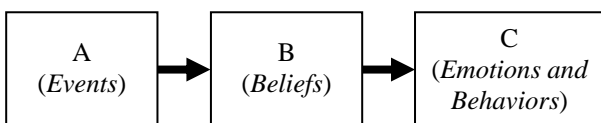


Figure 1. A-B-C Theory of Emotional Arousal (Mullin, 2000)

positive thoughts and feelings. By going through this process, individuals are expected to display safe driving behavior. On the other hand, in the advertisement intervention program, as how advertisement is usually presented to people, individuals receive an intervention that focuses on the one-way interaction. This implies that there is no dialogue or guidance from the intervention providers. It is expected that after the exposure period, which is also the same exposure period for CBT, individuals who receive advertisement intervention will experience the same effects as individuals who receive CBT. As seen in some places in Indonesia, several forms of safe driving advertising campaigns that have been mostly used include statistical boards that show the number of car accidents and victims every month, persuasive advertisements that remind the drivers of their loved ones, and placing wrecked cars on roadsides to show people the negative effect of driving aggressively. These various forms of advertisement aim to encourage drivers to be more careful and to demonstrate a safe way of driving.

Based on the assumptions described above, the process of changing aggressive driving behavior into safe driving behavior using advertisement can be described as follows (Fig. 2).

The advertisement components, i.e. message, appeal, and framing, have an impact on individuals' cognitive processes, such as perceived efficacy and perceived threat. However, empirical researches on the effectiveness of advertisement's power on encouraging safe driving behavior are still inconclusive. Studies conducted by Lewis, Watson, and Tay (2007) and Lewis, Watson, and White (2008) found that "fear appeal" advertisement could decrease aggressive driving effectively. It was assumed that the negative emotion, which was evoked by the negative advertisement, was set inside the viewers, which then led them to drive more slowly. Meanwhile, other studies showed that advertisements with humorous appeal were more persuasive than the non-humorous appeal, such as AIDS and sunscreen protection (Conway & Dubé, 2002; Struckman-Johnson, Struckman-Johnson, Gilliland, &

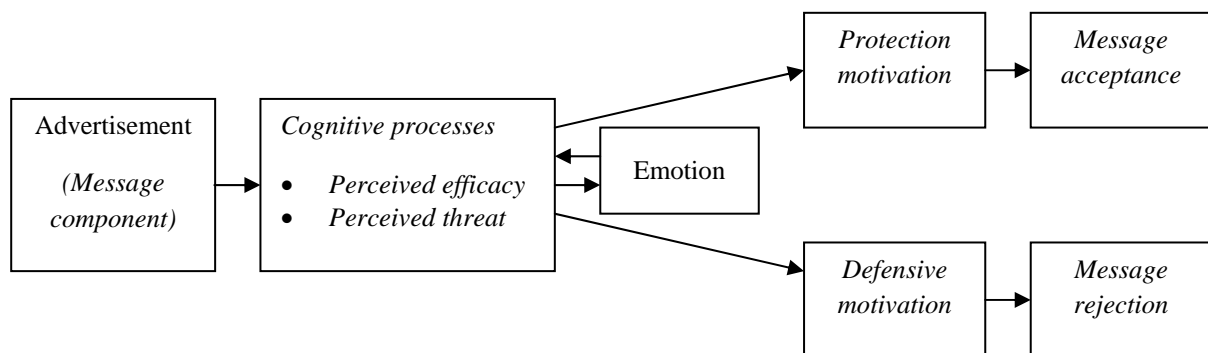


Figure 2. The Dynamics of Advertisement Influence on Driving Behaviors (Adapted from Timmers & Wijst, 2007)

Ausman, 1994; Hastings, Stead, & Webb cited in Lewis, Watson, & White, 2008). Therefore, the aims of the current study are to examine which intervention program (CBT versus positive and negative advertisements) is more effective in changing young drivers' aggressive driving behaviors into a safe way of driving?

Hypothesis. From the above description, it can be summarized that in CBT intervention program, individuals are guided to interpret the uncomfortable traffic situation they encounter and feelings resulting from this situation, and then they are asked to change their negative thoughts into more positive thoughts and interpretation; whereas, in the advertisement intervention, individuals are asked to interpret the uncomfortable traffic situation, and then they are presented with several situations that illustrate the effect of aggressive driving behavior. Based on the process of receiving CBT as well as advertisement intervention, it can be argued that in CBT, individuals have a more active role in processing the situation cognitively, whereas in advertisement intervention program, no conclusive result was yet found in the analysis of the effectiveness of positive/humorous and fear advertising appeals on reducing aggressive driving behavior. Therefore, the hypotheses of this study are as follows: CBT approach is more effective in changing aggressive driving behavior into safe driving behavior compared to the advertising approach. There is a significant difference in the effectiveness of positive/humorous advertising appeal and negative/fear advertising appeal on changing aggressive driving behavior into safe driving behavior.

2. Methods

Participants. A total of 196 young drivers who lived in DKI Jakarta and its surrounding areas (Jabodetabek) participated in this study. Their mean age was 25.75 ($SD = 5.60$), with a range of 18–35 years. The participants consisted of private and public transportation drivers, with the mean driving experience was 5.95 years ($SD = 4.41$). The participants were recruited using *non probability sampling technique*, i.e. *incidental sampling technique* (Gravetter & Forzano, 2009). Participants were then assigned into groups.

Instruments. The instruments consisted of two types, i.e. the intervention program and the measurement tools.

1) Intervention Programs

a. A-9 minute-video. The video film showed various driving situations and aggressive driving behaviors that motorcycle and car drivers on the road generally encountered, such as speeding, improperly getting in/out the lane, honking, motorcycle cutting in the edge, etc. The film was accompanied by a fast tempo Indonesian

song, which assumed to be able to stimulate a feeling of aggression (Anthony, 1998).

b. CBT Program. This program was made up of five modules, in which each module involved a three hours meeting session. The following is the focus of each session: (a) session one: introduction about safe driving behavior versus aggressive driving behavior, the influencing factors of driving behavior, and thinking management for safe driving behavior. In this session, the participants were also asked to identify the emotion and behavior they usually experience while driving on the road; (b) session two: introduction about the A-B-C Theory, the ways to alter negative thought into positive thought, and exercises on thinking management for safe driving behavior; (c) session three: introduction about relaxation technique and practice; (d) session four: introduction about the action program steps for managing emotion and producing safe driving behavior; and (e) session five: monitoring and evaluation on the implementation of the action program. The intervention program was conducted by an experimenter who has already trained to conduct CBT program, and was assisted by a facilitator.

c. Advertisements. Two types of advertisements developed in this study were: positive/humor appeal, and negative/fear appeal. Both types of advertisements showed pictures of driving situation on the road. Each type of advertisement consisted of three types of aggressive driving behavior that led to fatal consequences, i.e. speeding, tailgating, and red-light running. Negative advertising appeal (fear appeal) displayed terrifying pictures of three types of aggressive driving behavior, whereas positive advertising appeal (humorous appeal) showed amusing pictures of three types of aggressive driving behavior. They were printed on two types of paper size, A4 and half-letter paper size. A4 paper size was used to be put on places that was the most visible for participants while they were at home, whereas half-letter paper size was used to be put in the cars, in areas that was the most visible for the drivers while driving

2) Measurement Tools and The Scoring Technique

a. Perception questionnaire. It consisted of 6 open-ended questions about the participant's opinions and emotions concerning the driving situations that were seen in the video, as well as in the real situations. A negative response from the participants would be scored as 1, a neutral response as 2, whereas the positive response would be scored as 3.

b. Heart rate instrument. The heart rate instrument in this study was a simple physiological measurement, i.e. counting the heart rate by putting participants' thumb on the wrist for one minute. The number of the heart rate is assumed to be able to indicate anger emotion of the

participant (Stadler, *et al.*, 2006). This measurement was conducted as a form of manipulation check, which aimed to test whether there was anger and uncomfortable emotion occurred after watching the video about traffic situation on the road.

c. Frustration Scale, modified from *Revised Frustration Discomfort Scale* (Herrington, 2005). This scale consisted of 18 items and was used to measure the frustration level of each participant. The participant was asked to rate their feeling of frustration on a Likert type scale ranging from 1 (very inadequate) to 4 (very adequate). An example statement from the frustration scale would be, "I need the easiest way to release immediately from traffic congestion" (Indonesian translation: "Saya perlu cara yang paling mudah untuk bisa segera terbebas dari kemacetan.").

d. Emotion Inventory, modified from State Trait Anger Expressive Inventory developed by Spielberger. This inventory consisted of 15 statements concerning people's thoughts and emotions when they encountered messy situations on the road. Each item on the inventory had six levels of score (1 until 6). An example statement from this inventory would be, "I feel upset seeing other drivers running red lights" (Indonesian translation: "Saya merasa jengkel ketika melihat pengemudi yang melanggar lampu merah."). A closer response to score 1 means a weaker thoughts and emotions concerning the statement, and a closer response to score 6 means a stronger thoughts and emotions to the statement.

e. Driving Behavior Scale. Driving behavior was measured using two types of instruments: (a) *Driving Behavior Questionnaire (DBQ)*, which consisted of 21 items, and (b) a list of ten driving behaviors. The DBQ instrument was a modification of DBQ used by Reason *et al.* (in Claudel and Gabaude), measuring how often someone produced behavior related to driving conditions. The participant was asked to rate their behavior on a Likert type scale ranging from 1 (never) to 4 (always). An example statement from DBQ would be, "You turn around by jumping/passing through a traffic lane" (Indonesian translation: "Anda berputar arah dengan cara melompati/melewati pembatas jalan."). Whereas, on the second driving behavior instrument, the participants were asked to rank the ten items based on their experience, rank 1 for the behavior that occurred least often or never occurred, to rank 10 for the behavior that occurred most often or almost always occurred. The driving behaviors that should be ranked by the participants include: speeding, honking, crossing the red light, etc.

Procedure. After the participants gave their consent to participate in the intervention program, they were given a number starting from number 1 and so on. Then,

participants were randomly assigned to several groups. Participants who got number 1 were assigned into CBT group, participants who got number 2 were assigned into advertisement with negative/fear appeal intervention group, and participants who got number 3 were assigned into advertisements with positive/humorous appeal intervention group. This process was then repeated for participants who got the subsequent numbers (4, 5, 6, and so on), starting from CBT group, advertisement with negative/fear appeal intervention group, and advertisements with positive/humorous appeal intervention group. Each group received three stages of treatment, i.e.:

1) *The entering stage*. This stage was conducted at the first day of the program. Each participant was randomly divided into three treatment groups, by considering the kind of vehicle that they are used to drive (private or public transportation driver). Each group was asked to come to the group session. They were introduced with the objective of this study, the steps that they were going to do for the whole program, and were asked to sign an informed consent form when they agreed to participate in the whole program. After signing the informed consent, the participants were explained how to count their heart rate using their wrist and thumb. Then, the participants got a chance to try to find their heart rate on their wrist and count the heart rate. This exercise was done several times until the participants assured that they could count their heart rate. The nine minutes film then was presented to the participants on a presentation screen. The film was copied in the USB and operated using a notebook and an in-focus. Directly after the film ended, the participants were asked to count their own heart rate for one minute and reported it on a piece of paper. The participants were also asked to fill in the perception questionnaire. The data from this stage was used as pre-test data. This entering stage ended with a session explaining and discussing about driving behavior and the influencing factors of driving behavior.

2) *The treatment stage*: (a) The CBT program. All activity was done in group sessions. Every session was begun with the introduction about the topic and the activity of the session, followed by a review on the subjects and experiences that participants got from the former session, explanation concerning the new topics, discussion, exercise, and finally the session ended with an explanation for homework. All five sessions were executed in two weeks with 15 hours in total; (b) The advertisement program. A set of positive appeal advertisement or a set of negative appeal advertisement was given to each participant in the advertisement groups. Each participant was asked to bring the advertisement home and put them in a place where the participant could often see it mostly everyday, for example put the advertisement in their car. The participants received this treatment for seven days, with the assumption they were exposed to the advertisement for about two hours each day.

3) *Ending stage*. The participants were given the same task as in the entering stage. They gathered in the group session and they were asked to watch the nine minutes film, then counted their heart rate and filled in the perception questionnaire. The data from those measurements were used as post-test data. At the end of this stage the participants were asked to do reflection. This stage ended with participants strengthening their plan to create safe driving behavior, especially by controlling their speeding.

3. Results and Discussion

Out of the 196 participants who followed the entering stage, only 70.4 percent survived until the ending stage. Moreover, only 123 data of participants (62.76 percent) would be used for analysis, i.e. completed pre-test and post-test data.

A one-way ANOVA revealed that there was no mean difference in the pre-test on the variables perception, frustration, anger, and driving behavior among three treatment groups (Table 1). This showed that in the initial condition, three treatment groups did not have significantly different cognition, emotion, and driving behavior.

A mix factorial analysis found that there was a significant difference in the frustration mean between pre-test and post-test ($F= 42.884, p < 0.01$) and variable anger ($F= 7.058; p < 0.01$). A planned comparison on the variable frustration as well as variable anger showed that CBT group differed with both fear appeal advertisement group and humor appeal advertisement group. But there was no difference between fear appeal

group and humor appeal group. As seen in Table 2, there was no significant difference in driving behavior across time of measurement, i.e. between pre-test and post test. Table 2 also illustrated that there was no significant difference in perception, frustration, anger, and driving behavior, among intervention program groups. However, the interaction between intervention programs and time of measurement was found. This result showed that the effect of intervention program depended on the treatment period, which was represented by time interval measurement.

Perception on traffic situation. Descriptive analysis shows that more than half of the participants had negative perception concerning the traffic situation on the road that was shown in the nine minutes film. The crowded situation on the road and aggressive driving behavior demonstrated by the actors on the film were perceived as annoying by most participants. A total of 56.91 percent of participants had negative thoughts toward the situation on the road, and 74.80 percent of participants had negative emotions. Some negative words expressed by most participants concerning their thoughts among others were: boring, very bad, and time consuming; whereas negative words concerning their emotions were: bad mood, angry, upset, and frustrated. Nevertheless, only 48.36 percent of the participants perceived that the situation on the film could influence them to drive aggressively. This condition showed that negative thoughts and emotions felt by a number of participants were not automatically followed by negative driving behavior. This finding was found in all groups of participants, either before or after the intervention program.

Table 1. Pre-test Mean Differences in Perception, Frustration, Anger, and Driving Behavior among Three Intervention Groups

Variables	Intervention Groups	Pre-test		One way ANOVA	
		<i>M</i>	<i>SD</i>	<i>F</i> test	<i>p</i>
Perception	<i>CBT</i>	4.57	1.137	.027	.973
	Fear Appeal	4.65	1.538		
	Humor Appeal	4.83	1.412		
Frustration	<i>CBT</i>	4.65	1.538	2.489	.087
	Fear Appeal	38.89	4.813		
	Humor Appeal	36.56	5.488		
Anger	<i>CBT</i>	56.43	10.774	.363	.703
	Fear Appeal	54.85	10.623		
	Humor Appeal	53.38	11.561		
Driving Behavior	<i>CBT</i>	39.30	7.193	2.042	.134
	Fear Appeal	37.20	6.921		
	Humor Appeal	39.98	7.328		

Table 2. Mean differences in Frustration, Anger, and Driving Behavior among Three Groups: Pre-test and Post-test

Variables	Intervention Groups	Pre-test		Post-test		ANOVA Factorial (<i>F</i>)		
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	Time of measurement (time)	Intervention Program	Time x Intervention program
Perception	<i>CBT</i>	4.57	1.137	4.81	1.154	.112	.027	1.487
	Fear Appeal	4.65	1.538	4.63	1.466			
	Humour Appeal	4.83	1.412	4.47	1.377			
Frustration	<i>CBT</i>	39.53	5.755	37.91	5.107	42.884**	2.489	29.713**
	Fear Appeal	38.89	4.813	42.80	5.328			
	Humour Appeal	36.56	5.488	42.09	5.085			
Anger	<i>CBT</i>	56.43	10.774	50.30	11.579	7.058**	.353	3.418*
	Fear Appeal	54.85	10.623	54.04	8.260			
	Humuor Appeal	53.38	11.561	52.60	8.534			
Driving Behavior	<i>CBT</i>	39.30	7.193	38.28	6.460	.936	2.042	.421
	Fear Appeal	37.20	6.921	37.15	6.562			
	Humour Appeal	39.98	7.328	39.71	6.914			

As mentioned by most participants, the road situation on the film is similar to ordinary situation encountered in daily life, which is very crowded with no traffic rule. In a daily situation, they could not drive when they stuck in a crowded traffic although they feel bored, upset, and angry. Honking was the way to wreak their negative feeling when they stuck in traffic, while speeding was also one way to wreak their negative emotion when they could escape from traffic. However, as the road was crowded most of the time and they believed that they had no control over the road situation, they tried to control their emotions. Their daily experiences seemed to influence their response toward the road situation showed in the film.

Degree of Frustration. Mean score of the participants' frustration degree could be categorized as moderate (Mean pre-test = 2.78; Mean post-test = 2.68; Median = 2.5). When the post-test data was compared to the pre-test data, it could be seen that the intervention program had a significant effect on the frustration degree ($F_{(2,120)} = 6.962$, $p = 0.01$). As explained earlier, planned comparison analysis showed that CBT intervention program was significantly able to reduce the degree of frustration, while both advertisement intervention programs, i.e. positive advertisement and negative advertisement, were not significantly able to reduce the degree of frustration.

CBT program allegedly had a significant effect on reducing degree of frustration because the participants learned and had a chance to analyze the internal and

external factors that influenced their driving behavior, as well as how to manage safe driving behavior. On the other hand, the participants in the advertisement programs did not have a chance to analyze such factors, as what the participants in the CBT program did. Instead, the participants in the advertisement programs were immediately shown the consequences of aggressive driving behavior, therefore when they perceived that bad traffic situation, as shown in the film, was out of their control, they were less successful to control their frustration.

Anger Emotion. Participants' mean score of anger emotion, both before and after treatment, could be categorized as average (Mean pre-test = 3.67 and Mean post-test = 3.47, Median = 3.5) Their heart rate were in the range of 60-90 beats/minute, which were also in the limit of a normal heart rate (Laskowsky, 2010). Mixed design analysis found a significant main effect of time of measurement, no significant main effect of intervention program on anger emotion, as well as a significant interaction between time of measurement and intervention programs (see Table 2). That is, the effect of intervention program on reducing anger emotion depended on time interval, which was the interval between pre-test and post-test. In other words, the longer the intervention period, the more significant its effect on reducing anger emotion.

It seemed that participants in this study were really familiar with messy traffic situation in their daily life. As stated by most participants, they were aware

cognitively that the situation could not be changed, therefore they should have to accept the situation. This attitude could actually protect them from feeling stressful. This analysis was supported by their heart rate that was relatively stable. It seemed that the traffic situation shown in the film did not significantly provoke participants to change their emotion. Heart rate will increase significantly whenever someone feels really happy, or becomes worry or stress (Nury, 2009).

Driving Behavior. The mean score of the participants on the driving behavior questionnaire (DBQ) could be categorized as low (Mean pre-test = 1.86, and Mean post-test = 1.84; Median = 2.5). These mean scores indicated that participants did not display any aggressive driving behavior. The intervention program had no significant effect on driving behavior (Table 2).

Although the mean score on the DBQ was low, it did not mean that the participants did not conduct any aggressive driving behavior. Results from the second driving behavior instrument showed that they actually did some aggressive driving behavior on the road. Three aggressive driving behaviors that were mostly conducted by the participants were consecutively: speeding (56.1 percent), honking (pre-test = 47.2 percent), and changing lane inattentively (pre-test = 47.2 percent). Comparison analysis also showed that those three aggressive driving behavior were the most frequent behavior carried out by the participants in each treatment group.

The above description shows that there were some differences between driving behavior measured by DBQ instrument and by behavior rating. The low aggressive driving score on the DBQ seems to be due to the characteristic of the items, which are nuanced with social desirability bias. For example, "You feel that a vehicle at your side will cut your lane, then you will block that vehicle." In answering such item, there is a possibility that the participant will tend to report a good driving behavior in order to give a good impression about himself. On the other hand, on the behavior rating instrument, the participants were asked to report their driving behavior in their daily life. In this situation, they might be more focused on the driving behavior they frequently performed, thus they might be less aware that they scored high on the items which contained negative values. Besides, they might not make any comparison between their behavior and social expectation.

Result from this study shows that only 15 percent of the variance of driving behavior changes was explained by the time, intervention program, and all predictor variables involved in this study, i.e. perception, degree of frustration, and anger emotions. It means that there are still quite a lot of other variables that are needed to investigate to explain the driving behavior change.

4. Conclusions

The intervention program only had a significant effect on the degree of frustration and anger emotions when they interacted with the time of measurement. CBT was more effective in decreasing the degree of frustration than advertisements with fear and humorous appeal. Nevertheless, CBT approach seemed not to be significantly effective in reducing the level of anger emotion and aggressive driving behavior. These results were not congruent with the A-B-C Theory of Emotional Arousal proposed by Ellis (Mullin, 2000), which states that emotional reactions and human behaviors (C) toward a situation or event (A) are influenced by their beliefs or thoughts in regards to such situation or event (B). This research finding showed that participants' negative perception on traffic condition were not followed by changes in their emotional reactions and driving behavior because they believe that they could not change the traffic situation. This cognitive process seems to be useful to influence them to maintain their emotions at a normal state. This normal emotional state then can influence them to overcome feeling of anger more effectively (Falk & Montgomery, 2007).

In this study, both advertisements had no significant effect on changing the negative perception, and reducing the degree of frustration, anger emotion, and driving behavior as well. Compared to the CBT program, the participants in the advertisement approach had less opportunity to interact with other participants and to learn from others' experiences. In the advertisement approach, the participants chose their own time to be exposed to the advertisement, analyzed and interpreted the message based on their own perception and thoughts. Their involvement in the message processing seems to be low (low involvement), in which, according to Lewis, Watson, White, and Tay (2008), means that the individual only produces a peripheral process; the message is processed heuristically and less elaborately.

This study is also congruent with findings that show no difference in changing driving behavior between advertisements with fear appeal and humorous appeal. Therefore, it can be concluded that advertisement approach was not effective in changing driving behavior. The implication of this finding suggests that using advertisement as a means to control driving behavior needs to be considered more seriously. Actually, as a mass approach, advertising is effective from the coverage point of view, yet it is less effective from the behavior change point of view. In real situation, a very brief exposure to the advertisement and bad traffic conditions faced by the driver will prevent them to process the message more deeply. On the other hand, CBT approach seems to be more promising

although future study still needs to fill in the gap between frustration, anger emotion, and driving behavior.

References

- Badger J.E. (2002). *Human Factors*. <http://expertpages.com.news/humanfactors.htm>.
- Deffenbacher, J.L., Filetti, L.B., Lynch, R.S., Dahlen, E.R., & Oetting, E.R. (2002). Cognitive-behavioral treatment of high anger drivers. *Behavior Research and Therapy*, 40, 895-910.
- Fajen, B.R., & Devaney, M.C. (2006). Learning to control collisions: The role of perceptual attunement and action boundaries. *Journal of Experimental Psychology*, 32(2), 300-313.
- Falk, B., & Montgomery H. (2007). Developing traffic safety interventions from conception of risks and accidents. *Transportation Research Part F*, 10, 414-427.
- Fergusson, D., Swain-Campbell, N., & Horwood, J. (2003). Risky driving behavior in young people: Prevalence, personal characteristics and traffic accidents. *Australian and New Zealand Journal of Public Health*, 27(3), 337-342.
- Galovski, T.E., Blanchard, E.B., Malta, L.S., & Freidenberg, B.M. (2003). The psychophysiology of aggressive drivers: comparison to non aggressive drivers and pre to post treatment change following a cognitive behavioral treatment. *Behavior Research and Therapy*, 41, 1055-1067.
- Garrity, R.D., & Demick, J. (2001). Relations among personality traits, mood states, and driving behavior. *Journal of Adult Development*, 8(2), 109-118.
- Gravetter, F.J., & Forzano, L.B. (2009) *Research methods in behavioral sciences*. CA: Wadsworth Cengage Learning.
- Groeger, J.A. (2002). Trafficking in cognition: applying cognitive psychology to driving. *Transportation Research Part F*, 5(4), 235-249.
- Iverson, H. & Rundmo, T. (2002). Personality, risky driving and accident involvement among Norwegian drivers. *Personality and Individual Differences*, 33, 1251-1263.
- Laskowsky E.R. (2010). What's a normal resting heart rate? Accessed on June 28, 2010 from <http://www.Mayoclinic.com/health/heart-rate/AN01906.html>.
- Lewis, I., Watson, B., & Tay, R. (2007). Examining the Effectiveness of physical threats in road safety advertising: The role of the third person effect, gender, and age. *Transportation Research Part F*, 10, 48-60.
- Lewis, I., Watson, B., & White, K. (2008). An examination of message relevant affect in road safety messages: Should road safety advertisements aim to make us feel good or bad? *Transportation Research Part F*, 11, 403-417.
- Martin, G., & Pear, J. (2007). *Behavior Modification*. 8th Ed. New Jersey: Pearson, Prentice Hall.
- Mullin.R.E. (2000). *New Handbook of Cognitive Therapy Techniques*. New York: WW Norton & Company Inc.
- New South Wales Center for Road Safety (n.d). *Speeding Advertising Campaign*. Accessed on February 10, 2009 from <http://www.rta.nsw.gov.au/roadsafety/speedandspeedcameras/campaigns/speeding.html>.
- Nury, N. (2009). Menakar Denyut Jantung, Menakar Bugar. Accessed on on June 28, 2010 from www.Wikimu.com/news/displaynews.aspx?id=12506.
- Papalia, D.E, Sally, W.O., & Ruth, D.F (2004). *Human Development*. 11th Edition. New York: McGraw-Hill Companies, Inc.
- Shope J.T. (2006). Influences on youthful driving behavior and their potential for guiding interventions to reduce crashes. *Injury prevention*, 12, 9-14.
- Stadler, C., Rohrmann, S., Steuber, S., & Poustka, F. (2006). Effects of provocation on emotions and aggression: An experimental study with aggressive children. *Swiss Journal of Psychology*, 65(2), 117-124.
- Tasca, L. (2000). *A Review of the Literature on Aggressive Driving Research*. Accessed from: <http://safety.transportation.org/htmlguides/AggDrvr/app06.htm>.
- Timmers, R., & Wijst, P.C.D. (2007). Images as anti smoking fear appeals: The effect of emotion on the persuasion process. *Information Design Journal*, 15(1), 21-36.
- Westbrook.D, Kennerley H. & Kirk, J. (2007). *An Introduction to cognitive Behaviour Therapy*. London: Sage Publication Ltd.