



A STUDY OF AGGRESSIVE DRIVING BEHAVIORS

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ABSTRACT

Aggressive driving behaviors refer to the conscious behavior which damages to others on physical, psychological or emotional way. Different road environments will result in different emotions and cause drivers' different aggressive driving behaviors. The study has shown that aggressive driving brings great hidden danger on traffic safety.

This study aims to give a literature review and put forward a questionnaire of aggressive driving. Based on the literatures, study designs a questionnaire containing 3 parts. A total of 212 valid questionnaires are received in this questionnaire collection. As a result, female drivers and abecedarians are more cautious in driving. When drivers are influenced by others they are likely to be agitated. Study on aggressive driving can effectively reduce the incidence of traffic accidents to ensure people travel safety.

Keywords: Aggressive driving, Literature review, Questionnaire, Scene design

I. INTRODUCTION

Highway transportation plays an important role in the whole transportation system. At present, the total amount of highway freight and passenger transport in China is a high proportion of total social freight and passenger traffic, especially since the reform and opening up, the traffic infrastructure construction has made a lot of investment. Highway traffic not only brings the promotion of social progress and economic development, but also has a negative effect on the modern society. Road traffic safety is one of them.

From the view of traffic psychology, a typical traffic safety problem of road traffic called aggressive driving behavior catches the attention of experts and scholars. The results of survey^[1] in the United States in 1990 showed that about 90% people have at least once experiences of aggressive driving in the past year. The amount of accident of the aggressive driving behaviors also increased by about 51%, causing about 1500 people dead or injured.

From police report of the United States in 1996, there are nearly 2000 pieces of fierce road traffic accidents related to the road of violent crime, and that this is just the tip of an iceberg.

With the traffic congestion more serious and the social competition becoming more fiercely today, the drivers' aggressive driving behaviors become more frequent and has become a typical factor of traffic safety.

II. DEFINITION

Aggressive driving behavior is a kind of human aggression behavior, but it is different from other attacks. Aggressive driving behaviors occur in the road traffic environment, and the behavior usually happens in the process of driving.

First, All aggressive driving behaviors have a malicious purpose or motivation, which is an important factor or psychological condition different from other behaviors. That is, the occurrence of attack is a malicious intent or motivation. Without

malicious behavior it is not regarded as an aggressive driving behavior.

Secondly, aggressive driving behavior is to point to any object other than oneself. It is the key element of the aggressive behavior against the psychological anomaly or abnormal behavior.

Thirdly, results of aggressive driving behavior can cause corresponding injury consequences, such as psychological or mental abuse, intimidation or physical insult, assault, injury and other serious acts of violence.

III. LITERATURE REVIEW

Scholars at home and abroad have looking for ways to study aggressive driving. From the perspective of evaluation methods (specific data collection methods), the main method can be summarize of questionnaire, observation, social survey, interviews and so on. Each method has its own advantages and disadvantages, and it also has some limitations and shortcomings.

For the design of risk attitude questionnaire, Iverson (2002) finished questionnaire of adventure type driver's attitude^[2]. Yilmaz (2004) constructed a 14-item risk driving attitude scale^[3], and Rundo (2004) constructed the risk perception of 8 entries^[4]. Self-rating questionnaire of the driving technique is used to test the driver's driving skills, and the questionnaire was developed by Spolander earliest^[5]. Lajunen (1995) also developed questionnaire of the driver's driving technology in 2003 and it was used to evaluate the relationship between driving technology and risk attitude^[6].

Although the establishment of traffic psychology in China is relatively late, with the joint efforts of domestic scholars the research in this field has made great achievements.

Based on the review of domestic and foreign questionnaire, Luo yong from Southwest Jiaotong University carried out the research on aggressive driving behavior then constructed evaluation questionnaire of aggressive driving behavior. The study found that aggressive driving behavior dimensions have significant difference in terms of age, sex, occupation, driving and vehicle type^[7]. Ding Jingyan from Zhejiang University studied the basic situation of aggressive driving behavior in China and explored the influencing factors of aggressive driving behavior. The research results

show our country motor vehicle drivers in traffic exhibit aggressive driving behavior, and influenced by factors of age, gender, marital status and whether they work^[8]. The driving behavior and related factors of aggressive driving were analyzed by Zhuang Mingke of Peking University, and the four factors were proposed, which contained general violations, aggressive driving violations, harmless errors and dangerous mistakes^[9].

With the increasing pressure of social work and living rhythm, aggressive driving behavior will gradually become the typical factors that affect traffic safety. At present, it is still in the exploration of the theory to explain the produce of aggressive behavior, which is explained in the following several representative views^[10].

i. Theory of instincts: Freud believes that people have the instinct of survival and death and that "human beings are not gentle animals, and are considered to have a strong offensive in their natural talent"^[11].

ii. Frustration-attack theory: The theory believes that the reason why people produce aggressive behavior is that their experience in the society or the life suffered setbacks, pain and so on.

iii. Social learning theory: Bandura believes that the attack is the behavior of learning entirely, which can be obtained through social reinforcement, observation and imitation^[12].

According to the research of aggressive behaviors in the literature review, study on aggressive driving behaviors is still deficient, especially in China.

IV. QUESTIONNAIRE DESIGN

According the literature, the factors such as frustration, life background, education method, anonymous driving state and frustration can lead to aggressive driving behavior. These factors can be divided into 3 parts^[10].

- I. The driver's personal factor: The driver has some individual differences in the ability to control their own behavior. Different drivers will have different personality characteristics due to personal growth environment, gender, age, etc.
- II. The setback factor: When drivers suffer from stress, their own ability to control themselves usually will be poor.

III. The environmental factor: Traffic environment such as weather, traffic volume or road speed limit will be likely to affect aggressive driving behavior intention.

Based on these 3 factors (Drivers' personal factor, Setback factor and Environmental factor), questionnaire was designed. The questionnaire contained 8 questions, including 6 questions about personal information (gender, age, driving age, education, driving frequency, frequency of punishment), a questions about scene design and a question whether participant had an accident because of aggressive driving. The question about scene design contained 10 items which were shown as follows.

1. Other driver's frequent lane changes
2. Front car brakes suddenly
3. Other driver runs the red light
4. Road signs are not clear
5. Being hindered overtaking
6. Traffic jam
7. Honk
8. Being obstructed views by oversize vehicle
9. Cyclist or pedestrian cuts in
10. Other driver uses high beam

Respondents can choose the degree of fidget of these 10 scenes and the degree contained "slight", "common" and "serious". Then, respectively assign the score (1,2,3) to the degree (slight, common, serious). Next, the score plus percentage the degree being chosen and then sum to get a score of the scene.

At last, distribute the questionnaire on the Internet. A total of 212 valid questionnaires were received in this questionnaire collection.

V. RESULT

A) Analysis on frequency of punishment each year:

From the questionnaire, 70% of respondents are never punished each year. 20% of respondents are punished 1-2 times, 7% of respondents are punished 3-4 times and 3% of respondents are punished over

4 times each year. It can be expressed clearly in figure 1.

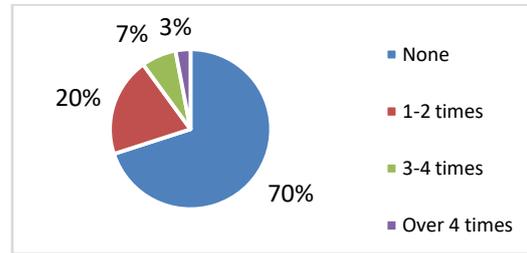


Figure 1: Frequency of Punishment of respondents
Rule of gender: 61 male respondents are never punished and it accounts for 68.5% of male respondents while the percentage of female respondents is 71.5%. 19 male respondents are punished 1-2 times and it accounts for 21.3% of male respondents while the percentage of female respondents is 11.3%. It can find that male drivers may cause more traffic security risk.

Rule of age: None punishment about different age is shown on figure 2. The percentage of young respondents (18-25) who are never punished is 83.6%, which is much larger than other age. When drivers' age is over 45, they are punished more frequently. The reason of this phenomenon may be explain that young drivers are more cautious as an abecedarian.

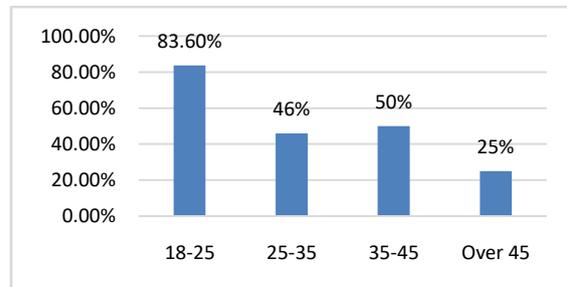


Figure 2: None punishment about different age
Rule of driving age: The rule is similar to the rule of age. Respondents with shorter driving age are punished less than other driving age.

B) Analysis on scene design

The 10 scenes and its fidget score are shown in Table 1.

Table 1: Scene design and its fidget score

Scene	Slight	Common	Serious	Score
1. Other driver's frequent lane changes	13.21%	59.91%	26.89%	2.14
2. Front car brakes suddenly	10.85%	40.09%	49.06%	2.38
3. Other driver runs the red light	26.42%	44.81%	28.77%	2.02
4. Road signs are not clear	23.11%	53.77%	23.11%	2.00

5. Being hindered overtaking	21.23%	54.25%	24.53%	2.03
6. Traffic jam	20.75%	52.83%	26.42%	2.06
7. Honk	10.38%	40.09%	49.53%	2.39
8. Being obstructed views by oversize vehicle	28.3%	46.7%	25%	1.97
9. Cyclist or pedestrian cuts in	16.51%	58.49%	25%	2.08
10. Other driver uses high beam	12.26%	50%	37.74%	2.25

From Table 1, except Scene 4 and Scene 8, all score of scenes is over 2. That is, number of respondents who chooses "serious" is more than number of respondents who chooses "slight". Drivers are generally more irritable against such scenes.

In these 10 scenes, Scene 3, 4 and 8 have a lower score than other scenes. The common point of these 3 scenes is that the scene which respondents confront does not point directly to the driver. Scene 3 (Other driver runs the red light) has less influence on driver. Scene 4 (Road signs are not clear) and Scene 8 (Being obstructed views by oversize vehicle) are common traffic conditions and make an influence on many drivers so that it is not easy to cause fidget and aggressive behaviors.

In these 10 scenes, Scene 2, 7 and 10 have a higher score than other scenes. The percentage of "serious" of Scene 2 (Front car brakes suddenly) and Scene 7 (Honk) nearly reaches 50%. In these 3 scenes respondents face other drivers' driving behaviors which influences them directly. Scene 2 and Scene 10 are direct attack behaviors to respondents and Scene 7 is easily considered a provocation. Compared with Scene 3, 4 and 8, it shows that the behavior which point directly to drivers will be more likely to induce aggressive behaviors.

VI. CONCLUSIONS

1. Near 30% of drivers will violate traffic rules and be punished every year. The quality of drivers need to be improved.
2. Male drivers are more likely to be agitated and violate traffic rules.
3. Young (18-25) drivers or abecedarians are cautious and calm in driving.
4. When drivers face scenes in which they are not pointed directly to, for example, road signs are not clear, drivers are not easily to be agitated.

5. When drivers face scenes which influences them directly they are likely to induce aggressive behaviors.

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