



## A questionnaire survey on road rage and anger-provoking situations in China

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### ABSTRACT

This paper surveys the reactions of Chinese drivers when encountering anger-provoking situations, including traffic congestion, pedestrians crossing the street illegally, being flashed by the high beams of cars traveling in the opposite direction, aberrant overtaking by other cars and when the car ahead drives slowly. A questionnaire survey found that 69.4% of participants wait when encountering traffic congestion and that 71% of drivers tolerate pedestrians crossing the street illegally; moreover, 61.3% of drivers are “angry but tolerant” when encountering aberrant overtaking. However, 51.3% of drivers become enraged when flashed by the high beams of cars traveling in the opposite direction, and 34.1% of participants turn on their own high beams to fight back. Moreover, 61.4% of participants are dissatisfied when the car ahead drives slowly or fails to move when a traffic light turns green, and 53% of participants honk or flash their lights to prompt the driver of the car ahead. The results show that males become irritated more easily than females in all situations, except those in which pedestrians cross the street illegally. Age is a factor only when drivers are flashed by high beams or overtaken by other cars illegally. Driving experience has an effect when drivers encounter traffic congestion, are flashed by high beams, or are overtaken by other cars illegally or when the car ahead drives slowly; novices with fewer than two years of driving experience display greater tolerance for these events. The occupation of a driver acts on his/her responses when he/she is overtaken by other cars illegally or flashed by high beams or when pedestrians cross the street illegally. For the most effective measures to prevent road rage, 53.64% of participants chose “plan the trip in advance”, 57.14% chose “strengthen law enforcement”, and 71.5% chose “improve public transportation”. Females, young people, and novices pay more attention to these measures.

### 1. Introduction

Road rage means that one is driving while enraged and captures the aggressive or angry behaviors of drivers of motorized vehicles. Such behaviors include vulgar gestures, verbal insults, dangerous driving, and threatening other people. A number of studies have found that angry drivers engage in aggressive and dangerous driving behaviors more often than non-angry drivers (Dahlen et al., 2005; Deffenbacher et al., 1994; Stephens and Groeger, 2011; Sullman et al., 2013; Sullman, 2015). In fact, Dahlen and Ragan (2004) went so far as to state that angry driving is one of the most influential predictors of aggressive and

risky driving behavior. Research has also found angry driving to be significantly related to near-misses (Underwood et al., 1999), slower reaction times to potential hazards (Stephens and Groeger, 2011; Stephens et al., 2013), and crash-related conditions, such as loss of concentration, losing control of the vehicle, and crash involvement (Deffenbacher et al., 2001, 2003; Sullman et al., 2007; Wells-Parker et al., 2002). Road rage is the external presentation of a mood involved in driving and is related to the character, driving skill, and psychology of the driver. However, road rage is not a spontaneous behavior; it is triggered only when the proper external conditions exist. The external conditions that trigger road rage include illegally changing lanes, cut-

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ting in, blocking the way, honking, overtaking, congestion, speeding, driving too slowly, flashing lights, scratching another vehicle, driving the wrong way, suddenly hitting the brakes, running a red light, complaining, aggressive gesturing, and colliding. (Deffenbacher et al., 1994, 2001; de Winter and Dodou, 2010; Iversen and Rundmo, 2002; Lajunen et al., 1998; Paleti et al., 2010; Zhang and Chan, 2016).

Many studies on road rage have been conducted using interviews or questionnaire surveys. These surveys include several scales, specifically the Driving Anger Scale (DAS; Deffenbacher et al., 1994); the Propensity for Angry Driving Scale (PADS; DePasquale et al., 2001); the Driving Anger Expression Inventory (DAX), which measures physical and verbal attacks, the use of vehicles as tools of aggression and adaptive or constructive practices; and the Driver Behavior Questionnaire (DBQ), which measures errors, lapses, and violations (Reason et al., 1990; Lawton et al., 1997). Some studies have shown that younger drivers are more likely to engage in violations (Lajunen et al., 1998; Sullman et al., 2002). They also report higher levels of driving anger (Ge et al., 2015; Lajunen et al., 1998; Sullman, 2006) and are involved in crashes more frequently (e.g., Parker et al., 2002; Sullman et al., 2002). In contrast, older and more experienced drivers tend to be less provoked to anger in general (Lajunen et al., 1998; Sullman, 2006; Sullman et al., 2007). Males and younger drivers exhibit more aggressive tendencies than females and older drivers (Haje and Symbaluk, 2014; Sullman et al., 2013; Sullman et al., 2014; Wickens et al., 2011). Being male and young and having greater driving experience produces a tendency toward greater driving anger (Lajunen et al., 1998). However, some studies have not found sex or age differences in the propensity to become aggressive while driving (Deffenbacher et al., 2007; Moore and Dahlen, 2008; Villieux and Delhomme, 2010) or have found that these traits have small effect sizes (Sârbescu et al., 2014). Other studies have found no gender differences (e.g., Dahlen et al., 2005; Deffenbacher et al., 1994) and no age differences (Dahlen and Ragan, 2004; DePasquale et al., 2001). Li et al. (2003) found that there was no significant relationship between driving anger and age or driving experience. Moreover, previous studies have identified a relationship between the mileage covered and the different dimensions of aggressive driving, such as verbal aggressive expression (Deffenbacher et al., 2002; Sullman, 2015) or the use of the vehicle to express anger (Sullman, 2015; Villieux and Delhomme, 2010). Some studies have shown that female drivers report significantly more anger in traffic than males (Sullman et al., 2014) and display more aggressive driving on some dimensions, such as verbal aggressive expression (Dahlen and Ragan, 2004), but female drivers still express driving anger in a more adaptive

or constructive manner than men (Deffenbacher et al., 2004). In contrast, men display a greater tendency to use their vehicles to express anger (Sullman, 2015). Contrary to Dahlen and Ragan (2004), Sullman (2015) found that verbal aggressive expression did not differ significantly between male and female drivers.

However, few studies have been conducted on road rage in Chinese drivers. For example, in Li et al. (2014), Chinese drivers reported less anger than U.S. students across all six subscales. Culture may account for some of these differences. No gender effects were revealed for driving anger in China. Compared with the findings of studies conducted in the US and Malaysia, the findings reported by Feng et al. (2016) also showed that professional drivers in China experienced lower levels of driving anger. Regarding demographics and descriptive variables, age, driving experience, and mileage were weakly correlated with driving anger, whereas preferred speed was positively and significantly related to driving anger. China is a country with a population of 1.4 billion people, of whom approximately 0.3 billion are drivers. In recent years, road rage accidents have been reported frequently in China; therefore, it is of great significance to investigate the road rage reactions of Chinese drivers in response to various stimuli. Moreover, existing studies assess road rage responses in general, and they lack the setting of specific scenes. In fact, road rage occurs in a variety of different scenarios. These anger-provoking stimuli include aberrant overtaking, honking, cutting in the lane, blocking the way, scratching or colliding, driving too slowly, flashing headlights, and other actions. The anger reactions of drivers under different conditions may differ strongly, and the influence of personal characteristics (including gender, age, occupation, driving experience, and other factors) on road rage are not the same in the different scenarios. Therefore, the purpose of this study is to evaluate the influence of the characteristics of people on the road rage that occurs under specific scenarios.

## 2. Methodology

### 2.1. Survey questionnaire

Different road rage scenes are set to investigate the influence of driver characteristics on road rage reactions. The questionnaire is as follows:

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