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Addressing Driver Aggression: Contributions From Psychological Science

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Abstract

Aggressive roadway behavior contributes to motor-vehicle collisions, resulting in significant injuries, fatalities, and related financial costs. Psychological models have identified person- and situation-related variables that are predictive of driver aggression, and these have been used to develop strategies to alleviate aggressive roadway behavior. Future psychological research directions are discussed.

Keywords

driver anger, driver aggression, violence, individual differences, interactionism

Aggressive roadway behavior increases the risk of motor-vehicle collisions and is associated with greater injury severity resulting from such collisions (Galovski, Malta, & Blanchard, 2006; Paleti, Eluru, & Bhat, 2010). Although estimates of the prevalence of aggressive driving vary considerably (see Galovski et al., 2006), the AAA Foundation for Traffic Safety (2009) reported that 56% of fatal crashes in the United States from 2003 through 2007 involved at least one driver action that is typically associated with driver aggression, such as excessive speeding or reckless/careless driving. Although 78% of Americans recognize the danger and resulting health and financial impact of aggressive driving, a significant number of American drivers admit to speeding to beat a yellow light (58%), pressuring other motorists to speed up (26%), and tailgating (22%; AAA Foundation for Traffic Safety, 2009). Given this paradox of attitude versus behavior, psychological science clearly has a role to play in furthering our understanding of what factors contribute to aggressive driver behavior and identifying potential solutions to the problem.

Defining Aggressive Driver Behavior

In addressing the issue of driver aggression, the first step must be to define the term. Most available statistics, including those cited in the prior paragraph, are based on a broad interpretation of aggressive driving; however,

there has been controversy concerning which aggressive acts meet the inclusion criteria. Many researchers have argued that the aggressive action must be deliberate. If one motorist has an accidental lapse in judgment and does not leave enough space when pulling in front of another driver, is this an example of aggressive driving? Another definitional issue involves the nature of the intention. Must the driver be motivated by hostility toward another motorist to be considered aggressive, or can the driver be motivated by impatience or an attempt to save time? Some researchers have argued that there is a distinction between aggressive and risky driving. The former involves harmful intent directed toward another motorist, whereas the latter involves exclusively selfish motives such as time urgency or thrill-seeking (for a thorough review of this debate, see Galovski et al., 2006; Wiesenthal, Lustman, & Roseborough, in press). For the purposes of streamlining the current review of a vast literature, *driver aggression* will be used to refer to violations of highway traffic laws (e.g., speeding, tailgating, reckless driving) and less serious anger expressions (e.g., swearing, obscene gestures) that are assumed to result from

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hostility directed toward another motorist; *driver violence* will be used to refer to violations of criminal laws (e.g., threatening harm, assault). These acts are not errors or lapses in judgment; they are aberrant driving behaviors (see Reason, Manstead, Stradling, Baxter, & Campbell, 1990) motivated specifically by hostility. Psychologists have postulated many theoretical models explaining driver aggression that hypothesize a combination of person-related and situational variables (e.g., Shinar, 1998).

Person-Related Contributors

Demographics

Person-related variables are those factors that are specific to the driver; arguably, they constitute the largest and most diverse class of contributory factors. Demographic characteristics are the most basic of these variables. Driver aggression is more common among the young and the unmarried, which may be explained by more frequent risk-taking behavior by these demographic groups. Driver aggression has also been seen more commonly among the well-educated and higher socioeconomic status groups, perhaps because they have more social engagements and may be more rushed for time, or they may be less deterred by the risk of fines should they be observed by the authorities (Wickens et al., 2012). Driver aggression has been shown to be greater among men than women, but the most significant gender difference is found with driver violence: men are much more likely to engage in this extreme behavior (Hennessy, Wiesenthal, Wickens, & Lustman, 2004).

Personality

Personality may affect our cognitive perception of a situation, our preferences regarding levels of arousal or stimulation, or our sensitivity to stress or threat, all of which play a role when we are driving (Matthews, Dorn, & Glendon, 1991). Drivers who frequently demonstrate high levels of verbal and physical aggression or anger in other aspects of their lives are generally more likely to do so in the driving environment (Deffenbacher, Deffenbacher, Lynch, & Richards, 2003). Narcissistic people are recognized as arrogant, selfish, and having a sense of entitlement. Narcissists have been found to engage in more retaliatory and vengeful behavior, perhaps because they are more likely to perceive ambiguous driving altercations as intentional or unjust (Lustman, Wiesenthal, & Flett, 2010). Sensation seeking, associated with a need for novel and intense stimuli, has generally been associated with risky driving behavior. This trait has also been identified as a significant predictor of driver aggression, perhaps because sensation seekers perceive

less risk in, or accept the risk associated with, roadway aggression (Dahlen, Martin, Ragan, & Kuhlman, 2005). Impulsive people demonstrate poor control over thoughts and behaviors, often initiating behavior without significant forethought, and are more likely to use the vehicle as a weapon for retaliation (Dahlen et al., 2005). Type-A personality consists of a cluster of traits relevant to driver behavior including competitiveness, hostility, achievement motivation, and a sense of time urgency (Bone & Mowen, 2006; Wickens & Wiesenthal, 2005). Not surprisingly, Type-A personality is more common among aggressive than nonaggressive drivers (Miles & Johnson, 2003). Neuroticism is associated with feelings of anxiety, anger, envy, depressed mood, and poor emotional response to stress. Drivers high in neuroticism engage in more horn honking, tailgating, and using obscene hand gestures (Bone & Mowen, 2006). Other variables that have been found to contribute to driver aggression include machismo, extraversion, ego defensiveness, and emotional instability (Bone & Mowen, 2006; Krahé & Fenske, 2002; Neighbors, Vietor, & Knee, 2002; Sümer, Lajunen, & Özkan, 2005). There are also personality variables that have been found to reduce the likelihood that a driver will engage in roadway aggression, including high levels of conscientiousness and agreeableness (Bone & Mowen, 2006; Sümer et al., 2005).

Cognition

How we cognitively perceive a driving event will have a major impact on how we feel and eventually respond to the event. Stress researchers conceptualize cognition in driver aggression as involving appraisal of the demands of a stressful situation and ability to cope with them. A driver caught in a stressful driving situation characterized by crowded but quickly moving traffic, time urgency, and an unexpected near-collision may assess the situation as being greater than his/her personal resources can tolerate. The motorist may experience feelings of anger and may lash out aggressively (Matthews et al., 1991; Wickens & Wiesenthal, 2005). Attribution theorists have conceptualized the role of cognition as a series of judgments regarding why an event occurred and the level of responsibility assigned to an offending driver. If we are cut off on the highway and assume that the offending driver's actions were intentional, we feel angry and may respond in kind. However, if we attribute the driver's actions to an unintentional cause such as a sudden tire blowout causing the vehicle to swerve in front of us, then we may feel sympathy for the other motorist (Wickens, Wiesenthal, Flora, & Flett, 2011).

Cognitive biases can also influence the development of driver aggression. When interpreting the potentially offensive actions of other motorists, drivers tend to overestimate

internal (e.g., personality) and underestimate external (e.g., situation) causes; however, drivers tend to do the opposite when making attributions for their own actions (i.e., the actor-observer bias; e.g., Herzog, 1994). Novice motorists tend to be overconfident of their driving skills (Mynttinen et al., 2009), thus lowering their tolerance for the perceived misdeeds of other motorists.

Alcohol, drugs, and mental health

Alcohol-related problems, use of cannabis, and use of these substances immediately before driving increase one's risk of engaging in driver aggression (Butters, Mann, & Smart, 2006; Wickens et al., 2012). Drivers reporting the use of cocaine, ecstasy (MDMA), or both are more likely to commit violent roadway behavior (Butters et al., 2006). The pharmacological effect of these substances on mood and inhibition, along with personality characteristics (e.g., trait anger or aggression, sensation seeking) common to drinkers, drug users, and aggressive drivers, may also explain the overlap in these behaviors.

Various psychiatric disorders have also been implicated as contributors to driver aggression. Intermittent explosive disorder is an impulse control disorder characterized by extreme expressions of anger out of proportion to the provoking stimulus. In a study of treatment-seeking aggressive drivers in Albany, New York, approximately one third of these drivers met criteria for intermittent explosive disorder, significantly more than a control sample of nonaggressive drivers (Galovski et al., 2006). Attention deficit hyperactivity disorder is characterized by inattention, impulsivity, and hyperactivity and is associated with increased self-reports of driving violations, anger, and aggression (Barkley & Cox, 2007). Attention deficit hyperactivity disorder often co-occurs with other disruptive behavior disorders, such as conduct disorder and oppositional defiant disorder. Relative to a sample of nonaggressive control subjects, these disorders have been found to be more prevalent among aggressive drivers (Malta, Blanchard, & Freidenberg, 2005). Personality disorders, such as antisocial personality disorder and paranoid personality disorder, are also more likely to be found among aggressive than nonaggressive drivers (Galovski et al., 2006). Psychiatric distress, which includes symptoms of both depression and anxiety, has been found to significantly increase the odds of perpetrated driver violence (Butters et al., 2006). Nonetheless, studies examining the impact of anxiety and mood disorders on driver aggression have generated mixed findings, providing some support for this relationship but necessitating additional research (Wickens, Mann, Butters, Smart, & Stoduto, in press). Finally, it is also important to note that medications used to ameliorate psychiatric problems may

influence, and perhaps increase, driver aggression (Wickens, Mann, Butters, et al., in press).

Situation-Related Contributors

Environmental factors

Sights, sounds, and smells can all play a role. The visual content of the roadside environment can influence the level of stress and negative affect experienced by drivers; urban roadways lined with commercial buildings and billboards generate more stress than rural roadways lined with natural vegetation (Parsons, Tassinari, Ulrich, Hebl, & Grossman-Alexander, 1998). Likewise, hostile cues such as aggressive billboard advertising or a gun rack in the window of a pickup truck increase driver anger and aggression (Ellison-Potter, Bell, & Deffenbacher, 2001). Sounds within the vehicle can also influence stress levels; self-selected music reduces stress experienced in heavy traffic congestion (Wiesenthal, Hennessy, & Totten, 2000). Likewise, the smell of peppermint decreases drivers' frustration, anxiety, and fatigue (Raudenbush, Grayhem, Sears, & Wilson, 2009), and rising ambient temperature increases drivers' horn honking (Kenrick & MacFarlane, 1986).

Situational factors

Within the driving environment, aspects of the situation can also elicit or augment anger behind the wheel that would not otherwise have emerged. Offensive driving by another motorist can provoke roadway anger and aggression (Wickens et al., 2011), but situational factors can further increase the likelihood of an aggressive response. Traffic congestion is a major source of roadway stress, and the resulting frustration may be directed aggressively at other motorists (Shinar, 1998). Daily hassles and job-related stresses can make traffic congestion or an offensive driver action seem much more upsetting (Matthews et al., 1991; Wickens & Wiesenthal, 2005). Likewise, time urgency can make traffic congestion or an otherwise benign traffic situation seem much more stressful (Wickens & Wiesenthal, 2005), which can lead to driver aggression.

Attributions of other drivers' roadway actions are influenced by the visible characteristics of that driver and the features of their vehicle. Female drivers are judged to be more careless and less aggressive than male drivers, and drivers of BMWs are judged to be more aggressive than drivers of Smart cars (Lawrence & Richardson, 2005). The relative status of vehicles also makes a difference in the likelihood of aggression; when blocked by a "middle-class" vehicle stopped at a green light, drivers of upper-class vehicles honk their horns more quickly than drivers

of middle-class vehicles, who honk more quickly than drivers of lower-class vehicles (Diekmann, Jungbauer-Gans, Krassnig, & Lorenz, 1996).

Alleviating Aggressive Driver Behavior

Beyond bettering our understanding of the factors that contribute to driver violence and aggression, psychological science is also developing strategies to alleviate the behavior. Programs to treat aggressive drivers are now being developed using cognitive-behavioral therapy, attributional retraining, and relaxation training (Galovski et al., 2006). These programs teach drivers to identify the triggers of their roadway anger and aggression, to recognize cognitive distortions that contribute to their anger, and to control their breathing and relax their muscles when an anger-provoking event is encountered. Additional evidence-based curricula could be added, such as recognizing the tendency to overestimate our own driving skills and emphasizing the importance of roadway communication (e.g., signaling lane changes, flashing headlights as a sign of gratitude; Wickens et al., 2011). Although development of these programs is in the early stages, the success of similarly-intended programs for persons convicted of driving while intoxicated (e.g., Wickens, Mann, Stoduto, Flam Zalcman, & Butters, 2013) suggests that these programs could substantially improve traffic safety if implemented on a large scale. These programs could also be beneficial if presented early in a novice driver's training.

Other attempts at behavior modification have included incentives for good driving: Instrumented vehicles or monitored traffic zones identify and reward law-abiding drivers with entries in a lottery or direct monetary compensation (Battista, Burns, & Taylor, 2010; Haggarty, 2010). Directed passenger feedback has also been used to encourage drivers to better monitor their speed and mirrors (Hutton, Sibley, Harper, & Hunt, 2002), although it is unclear how long this effect might persist, whether it could be used to reduce retaliatory aggression, and whether it is affected by the type of relationship between the driver and the passenger (e.g., teen driver and parent; see Wiesenthal et al., in press).

Psychological science can also advise police by identifying specific driving behaviors for enforcement campaigns and when these efforts should occur (Wickens, Wiesenthal, Hall, & Roseborough, 2013). It can inform public service and education campaigns through identification of the audience to target and the most effective focus of the public appeal (e.g., emotional versus informational; Lewis, Watson, White, & Tay, 2007). Psychological science also allows for the evaluation of various technological solutions to the driver aggression problem, including photo radar, red-light cameras, and electronic message boards over the highway for safety appeals or in

the rear window of a passenger vehicle to facilitate inter-vehicle communication (e.g., Chen, Meckle, & Wilson, 2002; Retting, Williams, Farmer, & Feldman, 1999; Smart, Cannon, Howard, & Mann, 2005).

Future Directions

Psychology is advancing our knowledge of factors contributing to driver aggression, adding to the list of relevant variables and expanding our understanding of existing factors. Person-related and situational variables operate together; thus, it is imperative that we continue to investigate how the contributions of multiple factors combine and interact to influence aggressive roadway behavior. We also need to understand the mechanisms underlying the influence of contributory factors. Personality, cognition, and affect all influence each other, and an improved assessment of the temporal order and strength of these influences is needed. Efforts to apply this information to modify driver aggression through policy, incentive-based approaches, psychotherapeutic programs (e.g., attributional retraining), and technological innovations to the vehicle and the roadway environment (e.g., electronic message boards) are in their infancy but possess great potential for impact.

Recommended Reading

- Asbridge, M., Smart, R. G., & Mann, R. E. (2006). Can we prevent road rage? *Trauma, Violence, & Abuse*, 7, 109–121. Reviews several different approaches to prevent driver aggression.
- Shinar, D. (2007). *Traffic safety and human behavior*. New York, NY: Elsevier. Provides an extensive discussion of scientific research examining driving behavior, including sections on the impact of personality and the driving environment on driver aggression.
- Wickens, C. M., Mann, R. E., Butters, J., Smart, R. G., & Stoduto, G. (in press). (See References). Presents a comprehensive overview of the association of driver aggression with psychiatric conditions.
- Wiesenthal, D. L., Lustman, M., & Roseborough, J. (in press). (See References). Provides a more comprehensive review of driver aggression research than the current article.

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