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Examining relationships between anxiety and dangerous driving

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ABSTRACT

Driving anxiety that has developed following crashes has been studied relatively frequently, but anxiety per se and its effects on driving has not as yet garnered much attention in the literature. The current study included 1121 participants and found higher levels of general anxiety were related to a wide variety of dangerous driving behaviors. While there were clear and expected sex differences on many dangerous driving variables, there were still more such differences with regard to anxiety levels and independent of sex, higher levels of anxiety were associated with greater levels of dangerous driving. Of particular import, it was found that the high anxiety group had caused significantly more crashes and engaged in more DUI episodes than the low and/or medium anxiety groups. Taken as a whole, the results suggest there is a tremendous need for more research in the area of anxiety and dangerous driving and that interventions for highly anxious drivers may well be warranted.

1. Introduction

As defined by the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV-TR, American Psychiatric Association, 2000), several anxiety disorders are potentially pertinent to driving (e.g., Generalized Anxiety Disorder, Panic Disorder, Post-Traumatic Stress Disorder). Within this class of disorders, it appears that Specific Phobias developed after motor vehicle crashes (MVCs) have been studied most extensively (Taylor et al., 2000; Ehlers et al., 1998; Delahanty et al., 1997). The earliest such research focused on treatments that reduced phobic anxiety by extinguishing conditioned reactions (Mowrer, 1960; Wolpe, 1958) and exposure-based treatments have consistently proven to be effective in this regard (e.g., Alphers et al., 2005; Ehlers et al., 1994; Llobet, 2009; Williams et al., 1984).

MVC-related PTSD has also received empirical attention and Ehlers et al. (1998) found enduring physical, psychological, and/or financial problems were not uncommon for victims of this disorder. For many, PTSD symptoms following a MVC include psychologically re-experiencing the crash, persistent avoidance of thoughts or situations associated with the crash, numbing of emotional responsiveness, and increased physical arousal (Beck and Coffey, 2007). Linnell and Easton (2004) found MVC whiplash victims were more likely to develop phobic avoidance of traveling as opposed to PTSD per se, and that this avoidance can adversely affect lifestyle and recovery (Linnell and Easton, 2004). This is consistent with Hodge's (1971) assertion that there is an association between fear of traveling in motor vehicles and whiplash injury.

Delahanty et al. (1997) found that MVC victims who did not cause their crash reported more long-term distress and were more likely to be diagnosed with PTSD than MVC victims who caused their crash. A persisting elevated perception of threat from others may be one reason why marginally more innocent victim participants developed PTSD than crash-causing participants. Kessler et al. (1995) estimated a lifetime PTSD prevalence of 8% in the United States, and found MVCs accounted for 19% of traumatic causal events. However, while there is a good deal of literature on driving phobia and crash-related PTSD, there is little research on general anxiety and its relationship to driving.

Anxiety is commonly conceptualized either as fitting in specific diagnostic categories or as a trait lying on a continuum. General anxiety should be differentiated from anxiety about driving specifically, which is not uncommon. For example, a sample of 100 New Zealanders were surveyed and almost 10% admitted to moderate to extreme driving fear and anxiety about driving, where women reported more negative emotions related to driving than did men (Taylor and Paki, 2008). In fact, anxiety can be construed in a number of ways as pertains to driving. For example, one study found fewer participants passed a driver's license test when a second testee was present during the test, than when participants were tested alone (Rosenbloom et al., 2007). This speaks to a fear of social observation and/or evaluation, a form of state anxiety that is common to many people, but likely heightened for those with higher levels of trait anxiety.

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Recently, Shahar (2009) studied trait anxiety in a sample of 120 Israeli male drivers, and found that drivers with higher levels of anxiety engaged in riskier behaviors. This was interpreted as being a function of worry as a limiting factor on overall working memory, limiting cognitive capacity that could otherwise be used for driving tasks. It was also determined that drivers with higher anxiety exhibited more aggressive behaviors, which was attributed to poorer emotional adjustment. On the other hand, a study of over 1000 Australian young adult drivers found no connection between anxiety and risky diving (Vassallo et al., 2008). While sample types and methods used to assess anxiety (the State-Trait Anxiety Inventory versus the Depression Anxiety Stress Scales and Revised Manifest Anxiety Scale, respectively) differed, discrepant findings such as these highlight a need for further research.

The current study examined the relationship between self-reported anxiety and dangerous driving behaviors. Dula and Geller (2004) suggested Dangerous Driving be used as a primary traffic safety research term, and that this main category be divided into subdivisions of Aggressive, Risky, and Negative Cognitive/Emotional Driving. The theoretical importance of such distinctions seems clear. 'Road rage' implies aggression, but researchers have used that term and 'driver aggression' to mean varied things. True aggression requires intent to harm to be present, and many previous definitions of driver aggression did not meet this criterion.

While aggression is often thought of as a physical act, it is possible for one to intend to harm in a non-physical manner as is done with insults or gestures intended to intimidate, insult or otherwise make another feel bad. Rarely, intent to harm may be present without negative emotions on the part of the aggressor, such as in the case of a psychopath or a ruffian taking pleasure in intimidating others or showing off.

Rarely do such behaviors as red light running, speeding, or weaving in and out of traffic, reflect intent to harm someone. Nor are such behaviors necessarily associated with negative emotions or cognitions. These behaviors are better classified as risky rather than aggressive or negative cognitive/emotional, but they are nonetheless dangerous.

Negative cognitive and/or emotional driving also warrants separate consideration. A driver might become angry or upset at another driver but not actually aggress toward the target of that anger. An upset driver may not willfully engage in particularly risky driving behaviors. However, being cognitively preoccupied with the feelings of anger and/or of being offended, takes away from the cognitive resources that could otherwise be applied to the driving situation. Of course, when a driver experiences what the public or media term 'road rage,' s/he then is likely to exhibit behaviors in all three domains of dangerous driving simultaneously.

Previous literature (e.g., Ehring et al., 2008) suggested that drivers with "travel phobia" tend to employ safer driving behaviors (e.g., drive more slowly in general, check their mirrors more frequently). However, this study is concerned with general anxiety symptoms in and not travel phobia specifically (nor any other type of specific anxiety disorder). As anxiety consumes cognitive resources (Eysenck and Byrne, 1992; Gucciardi and Dimmock, 2008) and as safe driving requires sustained attention and emotional composure, it was hypothesized that higher levels of anxiety would be related more an increased reporting of dangerous driving behaviors.

2. Method

2.1. Instruments

2.1.1. Dula Dangerous Driving Index (3DI)

The 3DI was created to measure dangerous driving behaviors in three subcategories: Aggressive Driving (AD, 7 items), Negative-Emotional Driving (NCE, 9 items), and Risky Driving (RD, 11 items) (Dula and Ballard, 2003). Dangerous Driving Total (DDT) scores are derived by summing the 28 items which are scored on a Likert scale with 1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Often, and 5 = Always. Subscale scores are calculated by adding the items within each scale and alpha coefficients for all 3DI scales have ranged from .73 to .92. Evidence for concurrent, divergent, and predictive validity has been demonstrated (Dula, 2003; Dula and Ballard, 2003) and a recent cross-cultural confirmatory factor analytic project firmly established the theoretical legitimacy of the subscale distinctions (Willemsen et al., 2008). One of the studies in this work was conducted in Belgium, where the 3DI was translated into Dutch following the procedure described by Brislin (1980). In addition to support for the factor distinctions, the results showed the 3DI had comparable reliability and validity across cultures. Internal consistency for each 3DI scale in the present sample was as follows: AD $\alpha = .85$; NCE $\alpha = .83$; RD $\alpha = .85$; and DDT $\alpha = .93$.

Though being only comprised of two items, a 3DI Drunk Driving (DD) factor has been identified and has shown evidence of validity, with prior alpha coefficients ranging from .67 to .79 (Willemsen et al., 2008). The RD subscale is inclusive of these two items, as driving intoxicated per se is a form of risky as opposed to aggressive and/or negative cognitive/emotional driving. Even so, these two items were added together in the present study and are included for inspection as a separate subscale factor. Note, however, that the RD subscale as presented below still includes these two items, consistent with Ballard and Dula (2003). Similarly, these two items are not counted twice in DDT scores. The DD scale showed adequate internal consistency in the present sample, with $\alpha = .77$.

2.1.2. Propensity for Angry Driving Scale (PADS; Depasquale et al., 2001)

The PADS consists of 19 scored hypothetical driving situations (e.g., "You are driving on a single lane road. For no apparent reason, the car in front of you is constantly braking and accelerating, causing you to drive in the same manner. How do you respond?"). After reading the prompt scenario, participants select one of four responses, weighted for relative hostility (e.g., Slow down a little and keep a safe distance; Deliberately tailgate the car and occasionally lay on the horn). When first developed, the PADS had excellent internal consistency, with $\alpha = 0.89$, and a four-week test–retest reliability of $r = 0.91$ (Depasquale et al., 2001). The utility, reliability, and validity of the measure has been confirmed in other studies, including with use in cross-cultural samples in Britain and Australia (Leal and Pachana, 2008; Brookings et al., 2008; Maxwell et al., 2005; Dahlen and Ragan, 2004). In the present sample, the PADS showed sufficient internal consistency, with $\alpha = .81$.

2.1.3. Beck Anxiety Inventory (BAI, Beck et al., 1988)

From a continuum perspective, the BAI is a distinguished measure of the presence of current anxiety in a person's life. The BAI has been a popular clinical and research measure for many years due to its high levels of internal consistency, its brevity (21 items), and because it was designed to distinguished anxiety from depression symptoms (Steer et al., 1993). A review of the BAI's use in the literature showed alpha coefficients are generally reported at .83 or better. While test–retest coefficients are reported from .35 to .83, this variability is likely due to the wide range of time intervals used (between 1 and 16 weeks) in these studies, where the BAI is only designed to measure symptoms experienced in past week (de Ayala et al., 2005). Symptoms are rated on a four-point Likert scale (0 = Not At All, 1 = Mildly, 2 = Moderately, and 3 = Severely) and scores are derived from adding the values of all responses. In the present sample, the BAI demonstrated excellent internal consistency, with $\alpha = .93$.