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Properties of the Driving Behavior Survey among individuals with motor vehicle accident-related posttraumatic stress disorder

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ABSTRACT

Data suggest anxious drivers may engage in problematic behaviors that place themselves and others at increased risk of negative traffic events. Three domains of problematic behavior – exaggerated safety/caution, performance deficits, and hostile/aggressive behaviors – previously were identified during development of the Driving Behavior Survey (DBS), a novel measure of anxiety-related behavior. Extending this research, the current study examined the psychometric properties of DBS scores among individuals with posttraumatic stress disorder (PTSD) subsequent to motor vehicle trauma ($N = 40$). Internal consistencies and 12-week test–retest reliabilities for DBS scales ranged from good to excellent. Comparison of scores to normative student data indicated dose–response relationships for safety/caution and performance deficit subscales, with increased frequency of anxious behavior occurring within the PTSD sample. Associations with standard clinical measures provide additional evidence for anxiety-related driving behavior as a unique marker of functional impairment, distinct from both avoidance and disorder-specific symptoms.

1. Introduction

Evidence from the clinical and traffic safety literatures indicate associations between elevated anxiety and problematic driving behaviors including performance errors, attentional lapses, aggressive violations, and at-fault collisions (e.g., Dula, Adams, Miesner, & Leonard, 2010; Matthews et al., 1998; Shahar, 2009; Taylor & Koch, 1995). Further research suggests these effects may be particularly robust among individuals with driving-specific fear (e.g., Taylor, Deane, & Podd, 2007a). The implications of this research for behavioral intervention have motivated recent efforts to isolate and assess specific domains of anxiety-related driving behavior (Clapp, Olsen, Beck et al., 2011). The aim of the present study was to evaluate the measurement properties of a novel measure of anxious driving behavior within a help-seeking sample of motor vehicle accident (MVA) survivors.

The influence of trait-level anxiety on driving performance is a common subject of investigation within the transportation and traffic safety literatures. While the relationship between these constructs is complex (see Taylor, Deane, & Podd, 2008 for a comprehensive review), several studies provide evidence for a detrimental effect of generalized trait-anxiety on driving performance. Early research by Shoham, Geva, Markovski, and Kaplinsky (1976) proposed that "anxious" drivers may be at similar risk of dangerous behavior as "reckless" drivers based on archival data of Israeli motorists. Follow-up analysis supported this hypothesis, noting significant associations between anxiety and the occurrence of traffic offenses (Shoham, Rahav, Markovski, Chard, & Baruch, 1984). Contemporary research also indicates associations between characterological anxiety and problematic traffic outcomes including risky driving behavior, performance deficits, aggressive violations, and at-fault accidents (Dula et al., 2010; Fairclough, Tattersall, & Houston, 2006; Lucidi et al., 2010; Shahar, 2009).

Further evidence of problematic behavior is noted in research detailing the impact of driving-specific fear. Treatment manuals and clinical reviews indicate a range of maladaptive behavior (e.g., skill deficits, excessive caution, erratic driving) as a consequence of driving anxiety related to phobia, panic, and posttraumatic stress (Antony, Craske, & Barlow, 2006; Koch & Taylor, 1995; Taylor & Koch, 1995; Taylor, Deane, & Podd, 2002). Problematic behavior detailed in this literature is supported through both self-report and observational studies involving fearful drivers. In an

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analysis of Greek motorists, Kontogiannis (2006) observed that driving-specific anxiety was associated with greater occurrence of driving errors controlling for age, gender, driving experience, and annual mileage. Similarly, Matthews et al. (1998) found driving anxiety to be associated with performance errors and poor vehicle control within the context of a driving simulation task. Most recently, Taylor et al. (2007a) evaluated driving proficiency on a standardized road test among motorists selected for high- and low-levels of driving fear. Anxious drivers in this study committed a greater number of traffic errors and rated themselves as having poorer driving skill relative to non-anxious controls. Observations provided by road test administrators further corroborated lower levels of skill within the subset of anxious motorists. In sum, convergent evidence from these literatures suggests a range of maladaptive behaviors characteristic of individuals who continue to drive despite feeling anxious. Assessment of these behaviors is important for both (a) understanding risk factors and processes contributing to driving-related impairment and (b) expanding systematic evaluation of interventions targeting travel-related anxiety.

The Driving Behavior Survey (DBS; Clapp, Olsen, Beck et al., 2011) is a self-report instrument developed to assess the frequency of anxiety-related driving behavior. For this measure, anxious driving behavior was operationalized as an increase, decrease, or general disorganization of behavior occurring as a consequence of anxiety during operation of a motor vehicle. Scale construction followed an internal consistency approach (Clark & Watson, 1995) with the final measure developed iteratively across multiple samples of student motorists. Three unique domains of problematic behavior were identified based on factor analytic procedures. The first contained a collection of exaggerated safety and/or excessively cautious behaviors similar to those noted in the clinical literature (e.g., Mayou, Simken, & Threlfall, 1991; Taylor & Koch, 1995). Behaviors in this domain (e.g., maintaining excessive distances from other motorists, driving far below the posted speed limit, reducing speed before progressing through intersections) are conceptualized as efforts to enhance perceptions of safety and control. Unfortunately, efforts to reduce acute traffic distress are believed to facilitate the long-term maintenance of anxiety (Clark, 1999; Salkovskis, 1991) and may inadvertently increase accident risk to the extent that excessively cautious behaviors violate accepted traffic norms.

The second domain involves a series of anxiety-based performance deficits similar to those noted in the traffic and transportation safety literatures (e.g., Dula et al., 2010; Kontogiannis, 2006; Matthews et al., 1998). Behaviors in this domain (e.g., difficulty staying in the correct lane, sudden or inappropriate adjustments in speed, inability to perform basic traffic operations) are thought to occur primarily as a function of anxiety-based cognitive interference. Whereas low to moderate levels of anxiety often serve to facilitate performance, excessive anxiety is believed to compete with working memory resources necessary for processing task-relevant information (e.g., monitoring speed, direction, and vehicle position; Taylor et al., 2008).

The final domain of problematic behavior involves anxiety-based hostility and driving aggression. Although hostile/aggressive driving behavior (e.g., shouting, honking, aggressive gesturing) is less commonly examined as a consequence of driving-specific fear, trait-level anxiety consistently demonstrates associations with both driving anger and aggressive violations (Deffenbacher, Huff, Lynch, Oetting, & Salvatore, 2000; Lucidi et al., 2010; Shahar, 2009; Ulleberg, 2002). In this research, trait anxiety is believed to decrease the threshold for aggressive response to traffic-related stress, increasing risk for collisions, violations, and dangerous driving behavior (Deffenbacher et al., 2000; Deffenbacher, Lynch, Filetti, Dahlen, & Oetting, 2003). Research specifically targeting behavioral response to driving anxiety suggests that state-level fear may confer similar risk for driving-related hostility and aggression (Clapp, Olsen, Beck et al., 2011; Clapp, Olsen, Danoff-Burg et al., 2011).

Scale development efforts using general samples of student drivers (i.e., not selected for any specific characteristics) provide initial evidence of the factorial validity, internal consistency, temporal stability, and convergent associations of DBS scores (Clapp, Olsen, Beck et al., 2011). Follow-up research with student drivers endorsing traffic collision involvement offers additional support for the internal consistency and construct validity of responses (Clapp, Olsen, Danoff-Burg et al., 2011). Although the DBS exhibits potential as an intervention tool, no study to date has examined the measurement properties of the scale within a clinical sample. This is notable given that best-practice standards for psychological testing require formal evaluation of a measure prior to use in populations for which validation data are unavailable (APA, 1999; Standard 1.4).

The aim of the current study was to evaluate the reliability and performance of DBS scores in a help-seeking sample of community drivers with MVA-related posttraumatic stress disorder (PTSD). PTSD historically has been defined as an anxiety disorder developing in response to a traumatic event involving actual or threatened death, serious injury, and/or threat to the physical integrity of oneself or others (APA, 1980, 2000). Characteristic symptoms include reexperiencing the event (e.g., intrusive thoughts, distressing dreams), avoidance of thoughts and/or situations associated with the trauma, numbing of emotional response (e.g., detachment, flattened affect), and heightened arousal (e.g., irritability, hypervigilance). Although driving anxiety is diagnostically complex and pervasive in both clinical and non-clinical populations (Ehlers, Hofmann, Herda, & Roth, 1994; Taylor & Deane, 2000; Taylor et al., 2002; Taylor, Deane, & Podd, 2007b), individuals who develop PTSD following serious motor vehicle trauma have been shown to be at increased risk of elevated driving fear. Research indicates the overwhelming majority of individuals presenting for treatment acknowledge enduring driving-related tasks with elevated or extreme distress, with some estimates exceeding 90% of cases (e.g. Blanchard & Hickling, 2004; Kuch, Swinson, Kirby, 1985). Functional impairment as a consequence of driving-related anxiety is severe and has been identified as one of the most frequent motivations for help-seeking in this population (e.g., Blanchard & Hickling, 2004; Kuch, Cox, & Direnfeld, 1995). The extant data also provide evidence for observable changes in driving behavior following significant motor vehicle trauma (e.g., Interministerial Task Force, 1981; Mayou et al., 1991). Whereas increased caution and defensiveness are expected, dangerous or otherwise problematic behaviors as a result of driving-related anxiety have been identified as characteristic of individuals seeking treatment for MVA-related PTSD (Beck & Coffey, 2005; Koch & Taylor, 1995; Taylor & Koch, 1995).

A series of analyses were used to evaluate the psychometric properties of DBS scores in the current treatment-seeking sample. The stability of DBS scales was determined through estimates of internal consistency and 12-week test–retest reliability. Construct validity was evaluated through mean-comparisons with normative data obtained from unselected student (Clapp, Olsen, Beck et al., 2011) and student collision (Clapp, Olsen, Danoff-Burg et al., 2011) samples. Dose–response relations between severity of driving-related anxiety and domains of anxious driving behavior were expected, with DBS scores among treatment-seeking individuals hypothesized to exceed those observed in non-clinical samples. Finally, a series of exploratory analyses examined associations with a set of standard clinical measures. Of specific interest were relations with indices of PTSD severity, depressive symptomatology, and overt travel avoidance.