



Impulsivity-like traits and risky driving behaviors among college students

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ABSTRACT

The present study examined the predictive effects of five impulsivity-like traits (Premeditation, Perseverance, Sensation Seeking, Negative Urgency, and Positive Urgency) on driving outcomes (driving errors, driving lapses, driving violations, cell phone driving, traffic citations, and traffic collisions). With a convenience sample of 266 college student drivers, we found that each of the impulsivity-like traits was related to multiple risky driving outcomes. Positive Urgency (tendency to act impulsively when experiencing negative affect) was the most robust predictor of risky driving outcomes. Positive Urgency is a relatively newly conceptualized impulsivity-like trait that was not examined in the driving literature previously, suggesting a strong need to further examine its role as a personality trait related to risky driving. These findings generally support the multidimensional assessment of impulsivity-like traits, and they specifically support the addition of Positive Urgency to a list of risk factors for risky driving behaviors.

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1. Introduction

Understanding the factors that influence risky driving among young drivers has been the focus of traffic safety researchers for decades. According to the National Highway Traffic Safety Administration (NHTSA), in 2008, 23% of all traffic fatalities in the United States involved individuals between 16 and 24 years of age (NHTSA, 2009b). In addition, 37% of male drivers under the age of 25 who were involved in fatal crashes were speeding at the time of the crash. Safety belt use is also the lowest among those under 25 years old (NHTSA, 2009a). In fact, 59% of individuals involved in fatal crashes were unrestrained at the time of the crash (NHTSA, 2009a). These statistics demonstrate that young drivers are at elevated risk for fatal crashes compared to others. In the present study, we examine how five personality predispositions predict several types of risky driving behaviors and consequences of risky driving among college students: driving violations, driving errors, driving lapses, cell phone driving, traffic citations, and traffic collisions.

1.1. Impulsivity and risky driving

Although several studies have examined the relationship between ‘impulsivity’ and risky driving behaviors, the assessment of impulsivity is quite variable. In fact, one limitation with impulsivity research is that impulsivity is a very loose, heterogeneous construct (Dick et al., 2010). To overcome this limitation, Whiteside and Lynam (2001) administered several questionnaires designed to measure ‘impulsivity’ and used factor analytic methods to identify four distinct traits that are assessed by several questionnaires. Their primary factor reflected (lack of) Premeditation which is the tendency to actively think and plan prior to action. They also identified a (Negative) Urgency factor that reflects the tendency to act impulsively when experiencing negative affect. Their third factor represented Sensation Seeking, or the global tendency to seek excitement. Finally, their fourth factor represented (lack of) Perseverance, which reflects the tendency to persist on tasks until completion. They found that 20 subscales from various questionnaires loaded on one or more of these four factors. Extending this four factor model, Cyders et al. (2007) found that Urgency involves not only Negative Urgency (i.e., behaving impulsively when experiencing negative affect), but also Positive Urgency (i.e., behaving impulsively when experiencing positive affect), resulting in a five-factor model. According to these models, impulsive behavior can result from multiple, distinct traits that we will henceforth refer to as impulsivity-like traits.

The four- and five-factor models of impulsivity-like traits have received much attention in research on risky behaviors,

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including alcohol use and alcohol-related consequences (Cyders et al., 2008; Murphy and MacKillop, 2012), illicit drug use and risky sexual behaviors (Zapolski et al., 2009), bulimia symptoms (Fischer et al., 2008), and suicidal behaviors/nonsuicidal self-injury (Lynam et al., 2011). However, we have yet to see an examination of the relationship between the five impulsivity-like traits and driving behavior.

1.2. Premeditation and risky driving

Whiteside and Lynam (2001) found several subscales of impulsivity that load on the latent factor that they referred to as Premeditation. Using these factor analytic findings as a guide, we carefully combed the literature for studies that examined the relationships between any of the subscales identified by Whiteside and Lynam and driving outcomes. Specifically, we found five studies that used one of the these subscales and examined bivariate or multivariate relationships with driving outcomes: Control subscale from the Multidimensional Personality Questionnaire (MPQ; Tellegen, 1982), Deliberation subscale from the NEO-PI-R (Costa and McCrae, 1992), I-7 Impulsiveness Scale (Eysenck et al., 1985), the Impulsivity Scale of the Personality Research Form (PRF; Jackson, 1984), and the Nonplanning and Motor Impulsivity subscales from the Barrett Impulsiveness Scale (BIS; Patton et al., 1995).

Caspi et al. (1997) found that MPQ Control subscale scores at 18 predicted whether individuals could be classified as having dangerous driving habits (drink-driving/riding or inconsistently wearing seat belts) at age 21. Thus, a lack of Premeditation was associated with riskier driving prospectively. In a study conducted in Canada, Hong and Paunonen (2009) found the NEO-PI-R Deliberation scale (i.e., higher Premeditation) was significantly negatively related to speeding in two out of three college student samples, which produced a significant averaged correlation ($r = -.20$). Using the Impulsivity subscale of the I-7, Lajunen and Parker (2001) found that “impulsivity” (lack of Premeditation) was not related to either anger or aggression while driving when controlling for general anger and aggressiveness. Using the PRF Impulsivity subscale with a sample of young men in British Columbia, Vavrik (1997) found no difference in “impulsivity” between drivers who had at least two at-fault accidents in the past 2 years and drivers who had no such incidents.

In a study of White Greek-Cypriots, Constantinou et al. (2011) used two subscales that load on the Premeditation factor (BIS Motor Impulsiveness and Nonplanning subscales) and examined their relationships with three subscales that they created from an exploratory factor analysis of questions from a modified version of the Driving Behavior Questionnaire (Kontoyiannis et al., 2002; Lajunen et al., 2004; Reason et al., 1990): aggressive violations, ordinary violations, and mistakes (i.e., errors and lapses). They found that motor impulsiveness was significantly positively correlated with ordinary violations, aggressive violations, and driving mistakes, and nonplanning was significantly positively correlated with aggressive violations and mistakes (but non-significantly positively correlated with ordinary violations). Thus, a lack of Premeditation was generally related to riskier driving in five out of six statistical tests. Constantinou et al. (2011) also examined a path model in which nonplanning was found to predict ordinary (i.e., non-aggressive) driving violations when controlling for sensitivity to reward, driving experience, and disinhibition (which loads on the Perseverance factor), but did not have a direct effect on traffic offenses.

Overall, it appears that individuals who are low in Premeditation are more likely to engage in risky driving, but there is some inconsistency with which Premeditation is related to some driving outcomes like aggressive driving (Constantinou et al., 2011; Lajunen and Parker, 2001). Based on the studies reviewed above,

we were able to make the bivariate prediction that Premeditation would be correlated with less driving violations, driving errors, and driving lapses, but were unable to make specific hypotheses regarding cell phone driving, traffic violations, and traffic crashes. Although there is some evidence that Premeditation would not be related to traffic violations (Constantinou et al., 2011; Vavrik, 1997), we made a point in deriving our hypotheses to not predict null results given the difficulty of interpreting null results. For example, the group comparison approach with a sample of 100 young male drivers taken by Vavrik (1997) may not have had enough power to detect the relationship between Premeditation and traffic violations.

1.3. Negative Urgency and risky driving

Using Whiteside and Lynam's (2001) factor analysis, we found two studies with a relevant driving outcome that examined one of the scales that load on the Negative Urgency factor: Attentional Impulsivity from the BIS-11 (Patton et al., 1995) and the Impulsivity subscale from the NEO-PI-R (Costa and McCrae, 1992; French translation: Rolland et al., 1998).

In their sample of Greek-Cypriots, Constantinou et al. (2011) found that attentional impulsiveness was not significantly correlated with either ordinary or aggressive driving violations, but was weakly positively correlated with driving mistakes. It is important to note that this subscale had the weakest loading on the overall Negative Urgency factor identified by Whiteside and Lynam (2001). In a sample of Canadian men, Richer and Bergeron (2009) found that “impulsivity” was significantly positively correlated with driving under the influence of cannabis, driving under the influence of alcohol, risky driving (e.g., “I will weave in and out of slower traffic,” “I will drive if I am only mildly intoxicated or buzzed”; Dula and Ballard, 2003), but was non-significantly positively correlated with aggressive driving ($r = .13$; e.g., “I would tailgate a driver who annoys me”) and negative emotional driving ($r = .19$; “I drive when I am angry or upset”). We note the strength of these non-significant correlations because in the present study, we had sufficient power to detect correlations of these sizes.

Although two studies with very different samples from the present study, different measures of the Negative Urgency trait, and different measures of driving behaviors are not ideal for developing informed hypotheses, we believe these studies provide at least some support that Negative Urgency would be related to driving outcomes. Given the driving outcomes measured previously, we predicted that Negative Urgency would be positively related to driving violations as it overlaps with the “risky driving” subscale assessed by Richer and Bergeron (2009), as well as with driving errors and lapses as it overlaps with the “mistakes” subscale assessed by Constantinou et al. (2011). We were unable to make specific predictions regarding how Negative Urgency may relate to the other driving outcomes.

1.4. Sensation Seeking and risky driving

Sensation Seeking has long been examined as a predictor of risky driving behaviors. Jonah (1997) conducted a review of 40 studies that had been conducted between 1979 and 1997 and found a rather robust positive correlation between Sensation Seeking and risky driving, with most correlations ranging from .30 and .40. Jonah et al. (2001) found that Sensation Seeking was not only related to risky driving and aggressive driving, but it was associated with riskier driving in response to a safety enhancement. Specifically, individuals high in Sensation Seeking were more likely to report they would drive faster on highways, drive faster on wet roads, and drive after consuming alcohol if their vehicle had anti-lock brakes. These findings suggest that as safety enhancements are made,

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