Accident Analysis and Prevention 92 (2016) 107–112

Contents lists available at ScienceDirect

Accident Analysis and Prevention

journal homepage: www.elsevier.com/locate/aap

Differential impact of personality traits on distracted driving behaviors in teens and older adults

Morgan N. Parr[a,b], Lesley A. Ross[c], Benjamin McManus[a,b], Haley J. Bishop[a,b], Shannon M.O. Wittig[a,b], Despina Stavrinos[a,b,*]

[a] Translational Research for Injury Prevention (TRIP) Laboratory, 916 19th Street South, Birmingham, AL 35294, United States
[b] Department of Psychology, University of Alabama at Birmingham, 1300 University Blvd., Birmingham, AL 35294, United States
[c] The Pennsylvania State University, Department of Human Development and Family Studies, 119 Health and Human Development Bldg., University Park, PA 16802, United States

ARTICLE INFO

Article history:
Received 14 January 2016
Received in revised form 7 March 2016
Accepted 14 March 2016
Available online 4 April 2016

Keywords:
Distracted driving
Big Five Personality
Texting
Teen drivers
Older drivers
Driving safety

ABSTRACT

Objective: To determine the impact of personality on distracted driving behaviors.
Method: Participants included 120 drivers (48 teens, 72 older adults) who completed the 45-item Big Five Personality questionnaire assessing self-reported personality factors and the Questionnaire Assessing Distracted Driving (QUADD) assessing the frequency of distracted driving behaviors. Associations for all five personality traits with each outcome (e.g., number of times texting on the phone, talking on the phone, and interacting with the phone while driving) were analyzed separately for teens and older adults using negative binomial or Poisson regressions that controlled for age, gender and education.
Results: In teens, higher levels of openness and conscientiousness were predictive of greater reported texting frequency and interacting with a phone while driving, while lower levels of agreeableness was predictive of fewer reported instances of texting and interacting with a phone while driving. In older adults, greater extraversion was predictive of greater reported talking on and interacting with a phone while driving. Other personality factors were not significantly associated with distracted driving behaviors.
Conclusions: Personality traits may be important predictors of distracted driving behaviors, though specific traits associated with distracted driving may vary across age groups. The relationship between personality and distracted driving behaviors provides a unique opportunity to target drivers who are more likely to engage in distracted driving behavior, thereby increasing the effectiveness of educational campaigns and improving driving safety.

1. Introduction

Motor vehicle collisions (MVCs) are one of the leading causes of death for individuals across the lifespan, with 15- to 20- year olds drivers accounting for 9% and drivers over the age of 65 accounting for 17% of all fatal crashes (Centers for Disease Control and Prevention [CDC], 2015). The underlying factors increasing crash risk for younger and older drivers are likely different, though one emerging concern for both groups is the use of electronic devices behind the wheel. Distracted driving (i.e., driving while performing a secondary task) is involved in nearly 50% of crashes, translating to one million injury-producing crashes with 10% of these crashes involving a fatality (National Highway Traffic Safety Administration [NHTSA], 2015). At any point during the day, about 660,000 drivers are using their cell phones in some manner while driving (NHTSA, 2013). To date, it is unclear what factors may influence an individual's decision to engage in distracted driving behaviors; however, personality traits have been hypothesized to partially underlie the decision to drive distracted among young and middle aged drivers (Constantinou et al., 2011; Jonah, 1997).

Although a substantial literature has examined the impact of demographics, health, sensory and cognitive functioning on driving behaviors, the influence of personality on driving behaviors is relatively understudied. One of the most widely accepted models of personality, and the focus of this study, is McCrae and Costa's "Big Five" personality model. According to this model, everyone falls within a continuum for each of five factors, namely: open-

* Corresponding author at: Department of Psychology, University of Alabama at Birmingham, 924 19th Street South, Birmingham, AL 35244, United States.
E-mail address: dstavrin@uab.edu (D. Stavrinos).

http://dx.doi.org/10.1016/j.aap.2016.03.011
0001-4575/

ness to experience, conscientiousness, extraversion, agreeableness, and neuroticism (OCEAN; (Costa and McCrae, 1992)). Each of these factors can be divided into subgroup traits found in individuals who demonstrate high levels of each factor. For example, traits associated with the openness factor include fantasy, actions, and ideas. Extraversion traits include, excitement seeking, activity, and warmth. Traits of neuroticism include anxiety, hostility, and impulsiveness (Costa and McCrae, 1992). Conscientiousness traits include order, dutifulness, and self-discipline, while agreeable traits include trust, altruism, and compliance (McCrae and Costa, 1997). Self-monitoring, or the ability to regulate one's behavior and reflect inwardly about actions (Snyder, 1974), has been found to be high in individuals with elevated scores on the personality scales of conscientiousness and agreeableness (Costa and McCrae, 1992). Cassidy (2005) found that extraversion has strong associations with susceptibility to peer influences.

Personality factors are closely related to driving behaviors in general, as well as common distracted driving activities, such as use of a cell phone while driving (Clarke and Robertson, 2005; Ehsani et al., 2013). Greater levels of self-monitoring have been found in individuals who have higher cell phone use and in individuals with higher levels of conscientiousness and agreeableness. Thus, it is possible that higher levels of conscientiousness and agreeableness may also transfer to increased risk of phone use while driving via greater self-monitoring behaviors (Lane and Manner, 2011; Takao et al., 2009). As such, it is likely that such traits may transfer to increased risk of cell phone use while driving. Surprisingly, little work has been conducted investigating the impact of personality factors on distracted driving across the lifespan. To date, only Lane and Manner (2011) examined personality traits and phone usage across the lifespan. They found that greater levels of extraversion were related to problem phone usage in mobile phone users aged 18–77. Despite its possible link to increased distracted driving behavior, it is still unclear what role personality traits may play in the tendency to engage in distracted driving.

To our knowledge, this is the first study to examine the relationships between the Big Five personality factors and self-reported distracted driving behaviors in both younger and older adults. Based on previous research, it is hypothesized that higher levels of extraversion, openness to experience, and agreeableness will be associated with higher reported levels of distracted driving behaviors (Ehsani et al., 2014; Takao et al., 2009). Due to previous findings of overall lowered conscientiousness and agreeableness scores in adolescents with a gradual increase through adulthood, it is hypothesized that older adults will have higher levels of both conscientiousness and agreeableness than teens (Soto et al., 2011). It is further hypothesized that higher conscientiousness and agreeableness in older adults will be related to lower reports of texting and driving in this group lower frequencies of such behaviors are associated with altruistic behaviors and compliance with social norms (Soto et al., 2011). It has also been found that older adults have a lower level of texting and driving which implies that they will continue this social norm while behind the wheel (Anstey et al., 2005).

2. Materials and method

2.1. Participants

The current study used data from the Senior and Adolescent Naturalistic Driving Study (SANDS), which investigated the driving behavior of 120 licensed drivers separated in two age groups: teens (aged 16–19 years) and older adults (aged 65–85 years). Forty-eight teens (M_{age} = 17.38 years, SD = 1.10) and 72 older adults (M_{age} = 72.29 years, SD = 5.36) participated. Eligibility criteria included (1) being between the ages of 16 and 19 years or 65 years and older, (2) having a valid driver's license, (3) being the primary driver of a vehicle with liability insurance, and (4) owning a cell phone with texting capabilities.

2.2. Procedure

All study procedures were approved by a university Institutional Review Board (IRB). Data collection occurred from 2013 to 2014 in one state that had previously banned text messaging. Data included demographic information, a baseline assessment, two weeks of normal activities, and a follow-up assessment. Upon completion of the study, participants were monetarily compensated.

2.3. Materials

2.3.1. Demographics questionnaire

Self-reported data was collected on age, gender, and ethnicity from both age groups

2.3.2. Questionnaire Assessing Distracted Driving (QUADD)

The QUADD assesses self-reported distracted driving behaviors including: texting, talking on a cell phone, and interacting with the phone while driving. Participants rated their frequency of each activity while driving by reporting number of times per day they engaged in the activity over the last two weeks. Example questions included: "In the last two weeks, how many times per day did you interact with a cell phone (touch, talk, hold, etc.) while driving?," "In the last two weeks, how many times per day did you talk on a 'hands-held' cell phone while driving?", and "In the last two weeks, how many times per day did you send a text on a cell phone while driving?". This measure has acceptable internal reliability ($\alpha \geq 0.70$) (Welburn et al., 2011).

2.3.3. Big Five Personality

The Big Five Personality (John and Srivastava, 1989) is a 45-item paper-and-pencil test assessing the degree to which a person believes that hypothetical situations apply to them using a Likert Scale (1 = strongly disagree; 5 = strongly agree). Example statements included: "is inventive" for openness, "makes plans and follows through with them" for conscientiousness, "is outgoing, sociable" for extraversion, "is considerate and kind to everyone" for agreeableness and "worries a lot" for neuroticism. Items are categorized into five factors, and a sum score is calculated for each of the Big Five personality factors: (1) openness, (2) conscientiousness, (3) extraversion, (4) agreeableness, and (5) neuroticism. This measure has good Internal reliability (α = 0.83), as well as good discriminant and convergent validity (John and Srivastava, 1989).

2.4. Data analysis

Descriptive statistics were obtained for the participant demographics, Big Five Personality traits, and self-reported engagement in distracted driving. Independent samples t-tests assessed group differences between the teens and older adults on the Big Five Personality factors and distracted driving behavior frequencies. Associations for the five personality traits were analyzed separately for teens and older adults using negative binomial or Poisson regressions depending on model fit as determined by Akaike Information Criteria (AIC), AIC Corrected (AICC) and Schwarz Bayesian Information Criteria (BIC) (Morel and Neerchal, 2012). All 5 Big Five Personality factor scores were included together as predictors for each of the 3 self-reported distracted driving outcomes (texting while driving, talking on a cell phone while driving and interacting with a phone while driving) for a total of 3 models