Personality and attitudes as predictors of risky driving among older drivers

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ABSTRACT

Although there are several studies on the effects of personality and attitudes on risky driving among young drivers, related research in older drivers is scarce. The present study assessed a model of personality-attitudes-risky driving in a large sample of active older drivers. A cross-sectional design was used, and structured and anonymous questionnaires were completed by 485 older Italian drivers (Mean age = 68.1, SD = 6.2, 61.2% males). The measures included personality traits, attitudes toward traffic safety, risky driving (errors, lapses, and traffic violations), and self-reported crash involvement and number of issued traffic tickets in the last 12 months. Structural equation modeling showed that personality traits predicted both directly and indirectly traffic violations, errors, and lapses. More positive attitudes toward traffic safety negatively predicted risky driving. In turn, risky driving was positively related to self-reported crash involvement and higher number of issued traffic tickets. Our findings suggest that theoretical models developed to account for risky driving of younger drivers may also apply in the older drivers, and accordingly be used to inform safe driving interventions for this age group.

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1. Introduction

Driving is the preferred mode of transportation among older people, it is easier and safer as compared to other forms of mobility, such as walking, and driving cessation among people aged over 65 has been associated with reduced quality of life and psychological well-being (Adler and Rottunda, 2006; Gruber et al., 2013; Whelan et al., 2006). According to the United Nations, Department of Economic and Social Affairs, Population Division (2013) people over the age of 60 represented 23% of the population of the more developed regions in 2012. Furthermore it is expected that people over 60 will reach 32% by 2050, thus, suggesting that a lot more older drivers are expected to be on the streets in the years to come. Car usage increasingly replaces other forms of mobility among elderly people, such as walking and use of public transportation (Whelan et al., 2006). Overall, the prevalence of people aged over 65 holding a valid driving license in developed countries is expected to increase significantly in the years to come, especially among females (Oxley et al., 2010). In fact, Mitchell (2013) showed that while the number of active male drivers aged over 70 will remain stable by 2030, the corresponding number of female older drivers will increase.

Drivers aged 65 or older represent a high risk group for traffic crashes, with higher fatality rates (78 fatalities per million population) as compared to drivers aged between 45 and 64 years (58 fatalities per million population; Broughton et al., 2012). In 2010, more than 6000 drivers aged over 65 in Europe died in crashes, accounting for 21.6% of all traffic fatalities in all age groups of active drivers (Brandstaetter et al., 2012). Also, some studies have shown that, compared to their younger counterparts (26–40 years old), older drivers (aged 65 or more) have higher crash risk in specific driving situations, such as road intersections, turning and changing lanes (Hakamies-Blomqvist, 1993; McGwin and Brown, 1999). The overall fatality rates among drivers over 65 steadily declined during the last decade. However, this age group remains susceptible to serious injury and frailty, and, unlike younger drivers, they are far more likely to sustain serious injury (i.e., tissue damage) or be killed when they are involved in a crash (Koppel et al., 2011; Welsh et al., 2006).

Driving is a highly complex task that draws on a variety of visual, motor, and cognitive skills that could be seriously affected by the aging process (Anstey et al., 2005; Gruber et al., 2013). Research on the cognitive and functional abilities of older drivers (e.g., Mathias and Lucas, 2009; Gaspar et al., 2013) has shown that specific cognitive functions, such as selective and divided attention, and

visuospatial memory are important for safe driving (e.g., Daigneault et al., 2002; Baldock et al., 2007; Richardson and Marottoli, 2003). Indicators of driving behaviors strictly related to these cognitive functions, such as errors and lapses at the wheel, are associated with an increased crash risk (e.g., Parker et al., 2000). Another strand of research has shown that older drivers who experience cognitive declines may engage in compensatory mechanisms by willfully changing their driving behaviors, such as restricting their driving and/or avoiding complex situations when driving (e.g., Festa et al., 2013; for a review see Devlin and Mcgillivray, 2014).

Aside from age-related cognitive decline, however, a growing body of studies shows that risky driving among the older drivers can be partly explained by individual differences, such as personality traits (Nichols et al., 2012; Adrian et al., 2011). Schwebel et al. (2007) found that sensation-seeking (the disposition to seek excitement) was significantly related to driving violations and number of issued traffic tickets, and that low temperamental control was related to higher scores in self-reported reckless driving. Accordingly, Owsley et al. (2003) showed that venturesomeness and empathy predicted more self-reported driving errors, whereas impulsivity predicted both driving errors and violations among older drivers. More recently, Adrian et al. (2011) found that extraversion was significantly (and negatively) related to driving performance behavior in this age group (aged 60 or more years).

The aforementioned studies have either assessed a limited set of personality dimensions related to risky driving among older drivers, or have largely utilized a univariate statistical approach (e.g., simple bivariate correlations or odds ratio) for data analysis. A multivariate perspective could lead to a better understanding of the relationships in question, and this has been usefully applied in studies addressing the role of personality traits on the driving behavior of younger drivers (e.g., 18–40 years), but not older drivers over 65. Within the young driver literature, some studies have focused on the impact of single personality dimensions upon risky driving behavior (e.g., Dahlen et al., 2005; Jonah et al., 2001; Özkan and Lajunen, 2005; Renner and Anderle, 2000), while others estimated the risk for traffic crashes on the basis of the multivariate combination of specific personality dimensions (e.g., Deery and Fildes, 1999; Ulleberg, 2001; Lucidi et al., 2010).

In behavioral sciences, personality is seen as a rather 'distal' predictor of behavior, which remains rather stable through time, and is less malleable by behavior-change interventions (Fishbein and Cappella, 2006). Instead, attitudes represent affective evaluations toward a specific object, person, or issue, are more transient, and can be more easily changed through interventions and accordingly produce long lasting changes in behavior (Bohner and Dickel, 2011; Petty et al., 1997). Most importantly, compared to personality traits, attitudes represent more immediate precursors of self-reported intentions and behavior (Fishbein, 2009). According to the Integrative Model of behavioral prediction, personality dispositions are said to exert their effects on self-reported behavior indirectly, through behavior-specific attitudes (Fishbein and Cappella, 2006). In the driving literature, however, very few studies have examined this process. In a study of young drivers Ulleberg and Rundmo (2003) showed that the effect of personality traits, such as altruism, anxiety, normlessness, sensation-seeking, aggression, on risky driving was mediated by the driver's attitudes toward traffic safety. Nevertheless, to the best of our knowledge, no studies have assessed a model of personality-attitudes-driving behavior in a sample of older drivers. This leaves an important gap in the driving literature for the following reasons that have also shaped the rationale of the present study.

At a theoretical level, it is important to empirically examine if the more universal processes suggested by contemporary behavioral models (i.e., Fishbein, 2009; Fishbein and Cappella, 2006), such

as the mediating role of attitudes in personality-behavior relationships, apply in driving behavior among older drivers. Furthermore, it is important to assess if the 'personality-attitudes-driving behavior' model suggested by Ulleberg and Rundmo (2003) for young drivers also applies in older drivers. This speaks directly to the universality of the specific theoretical model across age groups. At a practical level, better understanding how personality dispositions and beliefs relate to driving errors and car crash risk can lead to more focused and relevant evidence-based interventions for safe driving in older drivers.

The studies involving drivers of different ages should consider as possible outcomes of personality those driving behaviors that turn out to be more related to car crash risk in the specific age group. This is because the behaviors at the wheel that may increase crash risk can change with aging (e.g., Parker et al., 1995a,b; Parker et al., 2000). Reason et al.'s (1990) taxonomy provides a useful theoretical model that describes the types of aberrant behaviors related to crash risk across different ages, and also distinguishes between errors, lapses and violations in driving (Lajunen et al., 2004; Özkan et al., 2006; Parker et al., 1995a). Errors were defined as the failure of planned actions to achieve their intended consequences (e.g., brake too quickly on a slippery road) and largely represent information-processing deficits. Lapses have been described as failures in attention and memory (e.g., attempt to drive away from traffic lights in third gear). Finally violations were defined as conscious deviations from rules or safe driving practices (e.g., deciding to drive even when a known rule is violated, such as an elevated blood–alcohol ratio). In the last decades, several studies showed that violations, errors and lapses were differentially associated with crashes risk in drivers of different ages. For example in young/adult drivers, the reported violations were predictive of crash involvement, but errors or lapses did not predict crash involvement (Parker et al., 1995a,b). Conversely, the studies focused on older drivers (e.g., Parker et al., 2000) showed that both errors and lapses were predictive of involvement in car crash, while passive involvement in a crash was mainly associated with lapses.

In light of this evidence, it is possible that Ulleberg and Rundmo's (2003) model may present different predictors of risky driving, depending on the age group under study. For instance, whereas violations at the wheel is seen as an indicator for risky driving in younger drivers, a different group of indicators may predict risky driving in older drivers. Based on Reason et al. (1990) taxonomy, traffic violations, as well as self-reported errors and lapses may comprise risk indicators for crashes/collisions among older drivers. We further argue that Ulleberg and Rundmo's (2003) model can be useful in identifying the personality traits that relate to these risk indicators for crashes/collisions in older drivers.

In view of these arguments, the present study aimed to empirically examine the model of Ulleberg and Rundmo (2003) in a sample of older drivers aged between 60 and 90. It is noteworthy, that this is the first time the specific model is examined in this age group. It was expected that personality traits would predict self-reported driving behavior (driving violations, lapses, and errors) both directly, and through the effects of attitudes toward safe driving. A secondary aim of the study was to assess the relationship between the three self-reported behavioral indices (i.e., violations, errors and lapses) with self-reported crash involvement and number of issued traffic tickets.

2. Methods

2.1. Sample and procedure

Four- hundred and eighty-five healthy Italian older active drivers aged between 60 and 90 years participated in the study.