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The different effects of personality on prosocial and aggressive driving behaviour in a Chinese sample

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ABSTRACT

Dangerous driving behaviours, as a direct cause of accidents and death, are the focus of considerable research attention. However, unlike unsafe driving behaviours, few studies have explored safe driving behaviours and their effects on road traffic. This study aims to verify the Chinese version of the Prosocial and Aggressive Driving Inventory (PADI) and then investigate the relationship between personality and aggressive/prosocial driving behaviours. A total of 303 licensed drivers were recruited, and they voluntarily and anonymously completed the PADI, the Driving Behaviours Questionnaire (DBQ), and personality scales (anger, sensation-seeking and altruism). The results of this research confirmed the reliability and validity of the Chinese PADI. Most importantly, it was found that different relationships between different personalities and aggressive/prosocial driving behaviours. Specifically, individuals with high altruism exhibited more prosocial driving behaviours, while individuals with high sensation seeking presented more aggressive driving behaviours. The importance of these findings lies in two main potential implications: developing an effective measurement of prosocial driving behaviours in China and providing favourable evidence to guide drivers toward more prosocial driving behaviours.

1. Introduction

According to the Ministry of Public Security of the People's Republic of China (2017), as of the end of March 2017, the number of registered motor vehicles and motor vehicle drivers in China exceeded 300 million and 364 million, respectively. Although the number of traffic accidents is decreasing, a large increase in the volume of vehicle and drivers means that the total number of accidents remains high and has attracted increasing attention. The National Bureau of Statistics of China (NBSC, 2015) revealed that more than 180 thousand traffic accidents occurred in 2015, resulting in approximately 58 thousand deaths. These accidences and deaths resulted in great harm to many families; they also caused traffic jams and affected other road users. Therefore, an increasing number of people have become concerned about how to promote traffic safety, improve safety awareness and reduce the accident rate (Harre, 2000). Many studies have shown that human factors, especially driving behaviours, have a great influence on the occurrence of accidents (Lewin, 1982; Rumar, 1985; Sabey & Taylor, 1980). For example, many studies have found that aggressive driving behaviours were positively related to the incidence of accidents, penalty points and fines (Castillo-Manzano & Castro-Nuño, 2012; Harris et al., 2014; Hussain, Nayyara, Bradya, Beirne, & Stassen, 2006; Marengo, Settanni, & Vidotto, 2012; Qu, Ge, Jiang, Du, & Zhang, 2014). Empirical evidence shows

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that safe driving behaviours help to improve traffic order and flow, thus promoting traffic safety. However, to date, few studies have explored the impact of positive and safe driving behaviour.

Although only a handful of studies have directly focused on safe driving behaviours, there are many relevant studies addressing factors that have high correlations with safe driving behaviours, such as a safe driving attitude (Martinussen, Sømhovd, Møller, & Siebler, 2015; Ulleberg & Rundmo, 2003), safe driving styles (Kleisen, 2013; Poó, Taubman-Ben-Ari, Ledesma, & Díaz-Lázaro, 2013; Taubman-Ben-Ari, Mikulincer, & Gillath, 2004), safe perceptions (Sullivan, Smith, Horswill, & Lurie-Beck, 2011), positive driving behaviours (Guého, Granié, & Abric, 2014; Özkan & Lajunen, 2005) and less risky behaviour (Ba, Zhang, Peng, et al., 2016; Ba, Zhang, Salvendy, et al., 2016). These studies measured relevant variables and distinguished different types of drivers. Their main goal was to identify effective ways to reduce accidents and promote driving safety. For example, drivers with patient and careful driving styles tended to drive safely and were less likely to be involved in accidents (Poó et al., 2013; Taubman-Ben-Ari et al., 2004). These variables all related to safe driving behaviours, but there were some differences among them. Specifically, safe driving behaviours are more related to specific and comprehensive behaviours than to the purposes (positive driving behaviours), behavioural habits (safe driving styles), consciousness (safe perceptions) or attitudes in relation to driving. However, prosocial driving behaviour (Harris et al., 2014), as a new concept, is a manifestation of safe driving behaviours and emphasizes behaviours in various situations. Therefore, to specifically and thoroughly explore safe driving behaviours, the study of prosocial driving behaviours is a better choice.

To measure prosocial and antisocial driving behaviours together, Harris et al. (2014) created the Prosocial and Aggressive Driving Inventory (PADI). The PADI, a self-report questionnaire, comprehensively measures safe and unsafe driving practices based on the assumption that driving behaviours are stable and continuous characteristics of the drivers. The original PADI included 11 items from the Aggressive Driving Behaviour Scale (ADBS) (Houston, Harris, & Norman, 2003) and 25 items that were created by Harris et al. (2014) based on safe and unsafe driving behaviours described in driving manuals/handbooks. After a principal component analysis with Varimax rotation, 29 items were retained, including 17 items for prosocial driving behaviours (for example, "Decrease speed to accommodate poor weather conditions", "Slow down in a construction zone") and 12 items for aggressive driving behaviours (for example "Make rude gestures at other drivers when they do something I don't like", "Merge into traffic even when another driver tries to close the gap between vehicles") (Harris et al., 2014). Regarding the two dimensions of the PADI, aggressive driving behaviours refer to a pattern of unsafe driving behaviour that puts the driver and other road users in danger (Houston et al., 2003); correspondingly, prosocial driving behaviours refer to a pattern of safe driving behaviours that potentially protect the driver and other road users and help create a safe driving environment (Harris et al., 2014). Although a literature search found no Chinese version of the PADI or similar measurements, this does not mean there is no need for such tools. With the development of research, cross-cultural differences have gained increasing attention (Hilton & Skrutkowski, 2002; Lund & Rundmo, 2009; Ozkan, Lajunen, Chliaoutakis, Parker, & Summala, 2006; Warner, Oezkan, & Lajunen, 2009). On the one hand, population and road condition factors contribute to a more complex traffic environment in China than in America or Western countries (Jiaoyan, Du, Qu, Gong, & Sun, 2013). For example, many unexpected encounters, such as the presence of pedestrians and bicycles, occur on vehicular roads and cause serious road traffic danger in China. On the other hand, differences between Chinese and Americans in the understanding of safe driving is another non-negligible factor. Qualitative studies have found that Chinese drivers consider quick reactions, driving skills and capabilities very important features of safe driving, whereas American drivers concentrate more on safe driving guidelines and are willing to practice on the road rather than going to driving school (Huang, Zhang, Roetting, & Melton, 2006; Zhang, Huang, Roetting, Wang, & Wei, 2006). Therefore, the verification of a valid measurement that is suitable for the Chinese population is very meaningful and indispensable.

Unsafe driving behaviours have been discussed for many years and these behaviours can be measured by numerous scales effectively. The strongly positive relationship between aggressive driving behaviours and accidents has been proven in a series of studies (Castillo-Manzano & Castro-Nuño, 2012; Harris et al., 2014; Hussain et al., 2006; Marengo et al., 2012; Qu et al., 2014). Although few studies have focused on prosocial driving behaviours, Harris et al. (2014) recently found that prosocial driving behaviours could negatively predict accidents and violations. As a result, the relationship between prosocial and aggressive driving behaviours has aroused the interest of researchers. Harris et al. (2014) identified the negative relationship between prosocial driving behaviours and aggressive driving behaviours. Simultaneously, a few studies have found that positive driving behaviours were negatively related to violations, errors and aggressive behaviours (Guého et al., 2014; Özkan & Lajunen, 2005). Additionally, careful and patient driving skills, which are very relevant to safe driving behaviours, were negatively related to risky, high-velocity, dissociative, angry, anxious and distress-reduction driving styles (Poó et al., 2013; Taubman-Ben-Ari et al., 2004). From another perspective, the creation of a theoretical model for safe driving behaviours was conducive to creating a harmonious driving environment that discouraged unsafe driving behaviours.

Regarding individual differences in driving behaviours, personality has always received considerable attention. Several studies have proven that unsafe driving behaviours are positively correlated with some personality traits, such as anger and hostility (Dahlen, Edwards, Tubre, Zyphur, & Warren, 2012; Jiaoyan et al., 2013; Precht, Keinath, & Krems, 2017; Ulleberg & Rundmo, 2003; Zhang & Chan, 2016), sensation seeking (Dahlen, Martin, Ragan, & Kuhlman, 2005; Ge et al., 2014; Gonzalez-Iglesias, Antonio Gomez-Fraguela, & Angeles Luengo, 2014; Marengo et al., 2012; Ulleberg & Rundmo, 2003), normlessness (Jiaoyan et al., 2013; Ulleberg & Rundmo, 2003), and impulsiveness (Dahlen et al., 2005; Marengo et al., 2012; Starkey & Isler, 2016) and are negatively correlated with other personality traits, such as altruism (Ge et al., 2014; Jiaoyan et al., 2013; Mallia, Lazuras, Violani, & Lucidi, 2015; Marengo et al., 2012; Ulleberg & Rundmo, 2003), agreeableness (Benfield, Szlemko, & Bell, 2007; Dahlen et al., 2012; Dahlen & White, 2006; Ulleberg & Rundmo, 2003), and