Validation of the German version of the Driver Skill Inventory (DSI) and the Driver Social Desirability Scales (DSDS)

Martin Ostapczuk *, Robin Joseph, Janine Pufal, Jochen Musch

Heinrich Heine University, Düsseldorf, Germany

Abstract

The psychometric properties of the new German versions of the Driver Skill Inventory (DSI) and the Driver Social Desirability Scales (DSDS) were examined. The DSI is a self-report measure assessing perceptual-motor skills and the safety motive as two important aspects of driving behavior. Self-report measures, however, are susceptible to socially desirable responding (SDR) which is why both general and specific driving-related SDR scales have been developed. Based on the Balanced Inventory of Desirable Responding (BIDR), the DSDS taps Driver Impression Management and Driver Self-Deception as two important aspects of SDR. In two validation studies with less experienced (N = 130) and experienced drivers (N = 1199), both inventories showed the expected two-factor structure and satisfactory internal consistency. In Study 1, self-ratings were compared with and confirmed by peer-ratings. In both studies, we accumulated evidence of convergent and discriminant validity for the German version of the DSI by correlating it with demographic, driving-specific, and personality measures, including the Big Five, Type A behavior, and sensation seeking. The DSI seemed to be only marginally contaminated by SDR.

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1. Introduction

Traffic accidents are one of the most frequent causes of death in Germany. In 2012, 2,401,843 accidents occurred in Germany in which 299,637 people were injured, 3600 of whom died. Even though the number of injuries and casualties caused by traffic accidents has decreased since 1970, when 377,610 people were injured and 19,193 died, the total number of accidents on German roads has actually increased in the past few decades (German Federal Agency for Statistics, 2013). Given that traffic accidents give rise to substantial human distress and economic costs, it is particularly alarming that approximately 85–90% of road-traffic crashes are caused by driver error and could be prevented by more appropriate driving behavior (Lewin, 1982). Earlier studies have tried to detect an accident-prone personality (e.g., Elander, West, & French, 1993; Harano, Peck, & McBride, 1975). Nowadays, researchers consider both general factors, e.g., personality traits, and specific driving behavior factors, e.g., driving styles. The development of suitable standardized instruments is essential for this approach. Self-report measures, however, are prone to socially desirable responding (SDR). In the present study, we therefore translated an internationally wide-spread traffic behavior inventory as well as a driving specific SDR scale and submitted both measures to validation in two large samples of German drivers.

* Corresponding author at: Heinrich Heine-University Düsseldorf, Institute of Experimental Psychology, Building 23.03, Universitätsstr. 1, D-40225 Düsseldorf, Germany. Fax: +49 211 81 11753.
E-mail address: m.ostapczuk@hhu.de (M. Ostapczuk).

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2. Theory

2.1. Driving-specific behavior factors: Concepts, measurement and correlates

In spite of the agreement on the importance of traffic-specific human factors, there is little agreement on their conceptualization (Taubman-Ben-Ari, Mikulincer, & Gillath, 2004). Two traffic-specific human factors, however, are believed to explain a large portion of individual differences in driving: driving skills and driving styles (Elander et al., 1993; Taubman-Ben-Ari et al., 2004). These two dimensions have repeatedly been shown to be associated with a variety of personality characteristics and to predict accident involvement (Sümer, Ayvasik, & Er, 2005). Driving skills constitute a driver’s maximum level of performance on elements of the driving task (Elander et al., 1993; Warner, Özkan, Lajunen, & Tzamaloukas, 2013). They include, for instance, the time taken to detect and respond to a hazard and the use of the steering wheel to track the road. Driving skills thus consist of both, perceptual-motor abilities to maintain control of the vehicle and higher-order cognitive abilities, such as risk evaluation, and decision making, that in combination allow to respond adaptively to complex traffic situations (Elander et al., 1993; Taubman-Ben-Ari et al., 2004). Driving skills are expected to improve with practice and training (Elander et al., 1993). Driving styles, on the other hand, refer to the style in which individuals choose to drive or habitually drive (Elander et al., 1993). They include the choice of driving speed and the driver’s safety orientation, as well as his or her general attentiveness and attitudes toward other drivers and rules. Driving styles are expected to be influenced by specific beliefs about what makes a good driver, and also by more general needs and values (Elander et al., 1993; Taubman-Ben-Ari et al., 2004).

Mirroring the diversity of concepts on traffic-specific human factors, several self-report instruments are available allowing for a standardized assessment of traffic behaviors: An early self-report instrument was developed by Spolander (1983) to measure technical and defensive driving skills. Whereas the former includes quick and fluent car control and traffic situation management, the latter taps anticipatory accident avoidance skills. The Driver Skill Inventory (DSI; Lajunen & Summala, 1995) extended the contents of Hatakka, Keskinen, Katila, and Laapotti’s (1991), Hatakka, Keskinen, Laapotti, Katila, and Kiiski’s (1992) modification of Spolander’s (1983) Swedish instrument and confirmed the two-factor structure of the DSI, tapping perceptual-motor skills as the driving skill component and safety skills or safety motive as the driving style component. Of these inventories, the DSI has been most frequently validated in different countries, including the UK (Lajunen, Parker, & Stradling, 1998b), Australia and Finland (Lajunen, Corry, Summala, & Hartley, 1998a), Iran, Greece, and Turkey (Warner et al., 2013; Özkan, Lajunen, Chliaoutakis, Parker, & Summala, 2006). However, it has not yet been translated and validated in Germany. Given that there are remarkable national differences in driving styles (e.g., Özkan et al., 2006) and considering that Germany is the only country without a general speed limit on motor highways, the first aim of the present study was to translate and validate the two-factor DSI for German drivers using construct-related driving behavior and personality measures.

Research has consistently shown differential associations between these two — usually weakly related to unrelated — traffic-specific human factors on the one hand, and demographic measures, driving exposure measures and some personality measures on the other hand (Lajunen et al., 1998a; Sümer et al., 2005). Male drivers, for instance, are prone to overestimate their motor skills, which in turn leads to biased risk assessments and exaggerated levels of risk acceptance (e.g., McKenna, Stainer, & Lewis, 1991; Näätänen & Summala, 1976; Sümer, Özkan, & Lajunen, 2006; Özkan et al., 2006). Female drivers on the other hand, tend to stress their safety skills (Özkan & Lajunen, 2006). The (male) overestimation of motor skills develops rapidly after licensing when beginners experience a large variety of new traffic situations and increases with driving experience, which is often associated with an increased subjective control of driving, less concern for safety, and habitually driving with narrow safety margins (Lajunen & Summala, 1995; Näätänen & Summala, 1976; Spolander, 1983; Summala, 1985). As mentioned above, self-ratings of motor skill increase with increasing driving experience (Lajunen & Summala, 1995). Somewhat paradoxically, the number of accidents, penalties, and traffic endangering behaviors – such as speeding or using the phone and driving – have been found to be related positively to perceptual-motor skills, and negatively to safety skills (Lajunen & Summala, 1995; Lajunen et al., 1998a; Pöysti, Rajalin, & Summala, 2005; Sümer et al., 2006). For example, Sümer et al. (2006) showed that Turkish drivers reporting high levels of perceptual-motor skills and low levels of safety skills reported the highest numbers of accidents and penalties. Accident risk, however, was found to be lower for those reporting both high levels of perceptual-motor skills and high levels of safety skills. High levels of safety skills therefore seem to provide a buffer for the risks potentially associated with high levels of perceptual-motor skills. Correlations between motor skills and safety motive on the one hand, and personality measures on the other hand, are traditionally weaker than correlations between the two DSI dimensions and demographic and exposure measures (Lajunen & Summala, 1995). Some of the most extensively examined personality correlates of driving specific behaviors in general and motor skills and safety motive in specific, are Type A behavior, sensation seeking, and neuroticism and extraversion (Elander et al., 1993; Lajunen & Summala, 1995; Lajunen et al., 1998a). Type A describes a pattern of behavior that is associated with manifestations of coronary heart disease in men under the age of 55. Drivers with a Type A personality are described as being more intense, ambitious, and time conscious than slower moving, less aggressive, more easy-going individuals (Type B; Bortner, 1969; Nabi et al., 2005). In traffic contexts, they have been shown to have higher crash rates and to be involved in traffic violations more often than drivers with a Type B personality (Elander et al., 1993). Accordingly, Lajunen et al. (1998a) found Type A to be negatively associated with the DSI safety motive both in Australian and in Finnish drivers. Sensation seeking has been char-
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