



## Measuring risky driving behaviours among young drivers: Development of a scale for the Oman setting



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### ABSTRACT

**Background:** A large body of road safety research has focused on developing self-report measurement scales that identify the type and frequency of risk driving behaviours that lead to crash involvement. With the dearth of Arabic measurement tools, the aim of the study was to develop a modified, valid and reliable measurement tool that can be utilized among young drivers within the Oman context.

**Methods:** A total of 1319 (27.1% female) young drivers aged 17–25 years completed a questionnaire that was distributed through a snowballing sampling technique across Oman. The survey included a range of demographic information and driving behaviours, and utilized aspects of the Driver Behaviour Questionnaire (DBQ) and the Behaviour of Novice Young Drivers Scale (BNYDS). An exploratory factor analysis (EFA) was undertaken to examine the factor structure of the modified 40-items tool.

**Results:** A maximum likelihood and varimax rotation factor analysis revealed seven behavioural dimension comprising 39 items, which explained 49.28% of the variance in the behavioural scale of young drivers. These factors were transient violations (20.12% of the variance), mood driving (7.03% of the variance), speeding (6.59% of the variance), fatigue driving (4.36% of the variance), distracted driving (4.12% of the variance), seatbelt usage (3.55% of the variance) and close following (3.51% of the variance). The composite behavioural scale (39-items) showed an excellent internal consistency ( $\alpha = 0.939$ ) with transient violations exhibiting the highest internal consistency ( $\alpha = 0.927$ ) and close following showed the lowest internal consistency ( $\alpha = 0.700$ ). Crash predictability of the seven behavioural dimensions was investigated (as 39.6% of the sample reported crash involvement). Conducting logistic models between each behavioural dimensions and crash involvement adjusted for drivers' characteristics found that mood driving, fatigue driving and distracted driving were strong predictors of crash involvement among young drivers. However, consistent with previous research, the full model was not an efficient predictor of crash involvement among the sample of young Omani drivers, as distracted driving was the only significant predictor in the model.

**Conclusions:** The modified risky driving behaviours scale exhibited appropriate psychometric properties and key aberrant driving behaviours were associated with crash involve-

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ment. This paper further outlines the key study findings and provides suggestions for future research that aims to develop effective self-report methods to identify “at risk” drivers.

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## 1. Introduction

The origin and nature of traffic crashes continue to be empirically and theoretically investigated in order to reduce the road toll. An accumulating body of road safety literature indicates that risky driving behaviours are the leading cause of traffic crashes, and thus, represent a major public safety concern (Houston, Harris, & Norman, 2003; Iversen, 2004). Additionally, driving violations are the most common type of behaviour identified in young driver crash investigations, including exceeding the speed limit (Scott-Parker, Hyde, Watson, & King, 2013), following too close to the vehicle in front (Fu & Wilmot, 2008), and dangerous overtaking (Fernandes, Hatfield, & Job, 2010). Driving violations and errors have also been found to be common among young Omani drivers and they predict their crash involvement (Al Reesi et al., 2013). More specifically, official statistics reveal driving violations (e.g. speeding and dangerous overtaking) to be the main contributing factors to crash involvement in Oman (Royal Oman Police, 2014). Driver inattention has also been found to be a significant contributor in young drivers' crashes especially in the form of driver distraction (Neyens & Boyle, 2007). Mobile phones, inbuilt technology in vehicles, eating and drinking are all common sources of distraction that young drivers tend to engage in while driving (Shope, 2006). Furthermore, carrying many passengers particularly teens is another significant source of drivers distraction (Fu & Wilmot, 2008).

In Oman, the overall contribution of risky driving behaviours to the occurrence of crashes has been estimated to be up to 95% of the total crashes (Royal Oman Police, 2014), which is in line with the global proportion of contribution. It has also been revealed in the literature that individuals involved in one type of risky driving behaviour are likely to also engage in other types (Begg & Langley, 2004). Furthermore, Iversen (2004) suggested that crash involvement in a specified period reflects the amount of engagement in more risky driving behaviour in the same period.

As a result of the above, researchers have attempted to investigate risky driving behaviours through a range of self-report instrument tools developed to provide a better understanding of the most common dimensions of such behaviours, particularly among “at risk” populations (Scott-Parker, Watson, & King, 2010). A large body of road safety research has focused on developing self-report measurement scales that identify the frequency and type of risky driving behaviours that predict crashes. Such endeavors over the past 20 years have produced an array of measures including the: Manchester Driver Behaviour Questionnaire (DBQ) (Reason, Manstead, Stradling, Baxter, & Campbell, 1990), Driver Anger Scale (Deffenbacher, Oetting, & Lynch, 1994), Driver Attitude Questionnaire (DAQ) (Parker, Stradling, & Manstead, 1996), Driving Skill Inventory (Lajunen & Summala, 1997), the Safety Climate Questionnaire-MD (SCQ-MD) (Glendon & Stanton, 2000) and the Behaviour of Novice Young Drivers scale (BNYDS) (Scott-Parker et al., 2010).

Self-report data is heavily relied upon because it offers a number of advantages associated with economy and simplicity of use (af Wählberg, Dorn, & Kline, 2011). From the aspect that risky driving behaviours have unequal proportion of contribution to the occurrence of crashes (Laapotti & Keskinen, 2004), it is crucial to investigate which types of behaviours are most frequently exhibited by motorists and how much they contribute to crash involvement. However, a range of problems have been demonstrated to exist with self-report tools, such as their lack of predictive power (af Wählberg et al., 2011; Wishart, Freeman, Davey, Wilson, & Rowland, 2012), and a lack of ability to be able to distinguish between several forms of risky driving behaviours (Scott-Parker et al., 2010).

The most well-known self-report tool developed to measure risky driving behaviour is the Driver Behaviour Questionnaire (DBQ) which was originally developed by Reason et al. (1990). It was designed mainly to measure two dimensions of self-reported behaviours: “violations” and “errors”. “Violations are operationalized into two types- ‘ordinary violations’ (e.g. Speeding and crossing red lights) and ‘aggressive violation’ (e.g. honking to display anger or aggressive stance). ‘Errors’ refer to misjudgment such as failing to notice a cyclist or a pedestrian. The DBQ has been widely utilized within a range of cross-cultural populations (de Winter & Dodou, 2010; Lajunen, Parker, & Summala, 2004; O’zkan, Lajunen, Chliaoutakis, Summala, & Parker, 2006) including Arab communities such as the UAE, Qatar (Bener, Özkan, & Lajunen, 2008) and Oman (Al Reesi et al., 2013). Although, the DBQ was mainly developed to investigate driving behaviours among more experienced drivers, it has also been used among less experienced drivers and young drivers (e.g. Al Reesi et al., 2013; Bianchi & Summala, 2004). The internal consistency of the tool has been found to be good (Xie & Parker, 2002) or acceptable (Al Reesi et al., 2013; Bener et al., 2008; Davey, Wishart, Freeman, & Watson, 2007).

DBQ is one of the most widely researched instruments in traffic and behaviour. The semantics employed in DBQ still dominate the field but increasing loosing its relevancy due evolving factors that trigger traffic mishaps. The DBQ has attracted increasing criticism in recent times, particularly due to its poor predictive ability (af Wählberg, Dorn, de Winter, Dodou, & Freeman, 2012), and omission of other aberrant driving behaviours that directly contribute to crashes. In regards to the former, a recent meta-analytic review of the Driver Behaviour Questionnaire involving 174 studies estimated that the “violations” construct (which is a sub-factor of the scale) predicted crashes with correlations of 0.07 reported in multivariate

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