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The Driver Behaviour Questionnaire in Arab Gulf countries: Qatar and United Arab Emirates

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ABSTRACT

Manchester Driver Behaviour Questionnaire (DBQ) is one of the most widely used instruments for measuring self-reported driving style and investigating the relationship between driving behaviour and accident involvement. In spite of the fact that Arab Gulf countries have a higher road accident fatality rate compared to European countries and USA, the DBQ has not been used in Arab countries so far. The aim of the present study was to investigate the factor structure of the DBQ, then to examine the relationships between the factors of the DBQ and accident involvement, and finally to compare DBQ scores between the two gulf countries: Qatar and United Arab Emirates (UAE). In this study, 1110 Qatari (263 females and 847 males) and 1286 UAE drivers (294 females and 992 males) filled a survey questionnaire including the DBQ and background information. The results showed that UAE drivers scored higher on almost all DBQ items than Qatari drivers. Surprisingly, only very small differences between men and women on the DBQ item scores were found in UAE. Factor analysis resulted in four factors, which were named as errors, pushing-speeding violations, lapses, and aggression-speeding violations. However, there were a number of differences in the factor structure of the DBQ in UAE and Qatar when compared to the theoretical four-factor structure of the DBQ. Reliabilities of some subscales were also questionably lower than in the original British data. Logistic regression analyses showed that errors, lapses, and aggression-speeding violations predicted accident involvement in Qatar but not in UAE after controlling the effect of the demographic variables (age, sex, and annual mileage).

1. Introduction

Compared to European countries and USA, Arab countries have a very high road accident fatality rate. In 2000, 14.8, 11.7, and 7.3 persons per 10,000 vehicles were killed in Saudi, United Arab Emirati and Qatari road traffic, respectively (Bener et al., 2003). The same figures (1999 statistics) were, for example, approximately 1.8 for Finland, 2.4 for France, 1.5 for UK, and 1.9 for USA (IRF, 2003).

Analyses of traffic accidents indicate that human factors are a sole or a contributory factor in road traffic accidents (Lewin, 1982). Human factors in driving can be seen as being composed of two separate components, driving skills and driving style (Elander et al., 1993). Driving skills include those information processing and motor skills, which improve with practice and training, i.e. with driving experience. Driving style concerns individual driving habits, i.e. the way a driver chooses to drive. Driving style becomes established over a period of years, but does not necessarily get safer with driving experience (Elander et al., 1993).

Manchester Driver Behaviour Questionnaire (the DBQ) is one of the most widely used instruments for measuring driving style. The DBQ is based on a theoretical taxonomy of aberrant behaviours divided into violations and errors (see Reason, 1990; DBQ by Reason et al., 1990). Violations refer to "deliberate deviations from those practices believed necessary to maintain the safe operation of a potentially hazardous system". Violations can be classified as aggressive and ordinary ones (Lawton et al., 1997). The aggressive ones involve overtly aggressive acts whereas the ordinary ones consist of deliberately breaking the Highway codes and/or law without aggressive motives. Errors were defined as a "failure of planned actions to achieve their intended consequences that can involve the unwitting deviation of action from intention (slips and lapses) or departure of planned actions from some satisfactory path toward a desired goal (mistakes)".

In spite of small differences in the theoretical four-factor structure of the DBQ, the overall factor structure has been confirmed in different samples (for detailed description see Mesken et al., 2002;

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Lajunen et al., 2004; Sullman et al., 2002; Bener et al., 2007; Gras et al., 2006) also obtained the four-factor structure of the DBQ among Spanish drivers. However, there were a number of differences to the theoretical four-factor structure of the DBQ. Results of the factor analysis showed that lapses items loaded mostly on errors factors, which was a mixture of lapses and errors and one aggressive violations item. Lapses factor was relatively unreliable and composed of only three original lapses items. The Spanish factor structure did not include the original aggressive violations factor either. Rather, the results confirmed the interpersonal violations factor as a separate entity from the other aggressive violations. Besides, a strong violations factor including both ordinary and aggressive violations was obtained and the content of the factor was based on mainly "hurrying up" in traffic.

In the study by Gras et al. (2006) the alpha reliabilities for errors, lapses, interpersonal violations, and violations were 0.82, 0.46, 0.59, and 0.81, respectively. Except for lapses factor, reliabilities of the scales were at about the same level as in the original British data and other previous data (e.g., Lajunen et al., 2004; Parker et al., 1995b). The DBQ scores have also been found to be reliable over time (Parker et al., 1995a; Özkan et al., 2006a).

It has been, in general, reported that women and older drivers tend to commit violations less frequently than men and young drivers; female and older drivers, on the other hand, commit more errors than male and young drivers; it has also been found that the more drivers drive, the more often they tend to violate traffic rules (Åberg and Rimmö, 1998; Blockey and Hartley, 1995; Reason et al., 1990). Besides, Özkan et al. (2006b) reported that Western/Northern European drivers scored lower on errors and violations items than Southern European/Middle Eastern drivers. It can be concluded that both external factors (e.g., traffic culture) and internal factors (e.g., age and gender) influence the frequency of different driver behaviours (see Özkan, 2006).

The findings of the previous studies have also shown that self-reported driving violations are associated with both active (a driver hits another car or road user) and passive (a driver is hit by another vehicle) accidents. Besides, violations predicted accident involvement, both retrospectively and prospectively (Parker et al., 1995a,b). In particular, violations have been reported to be associated with active loss-of-control and passive right-of-way accidents (Parker et al., 1995b), as well as with speeding and parking offences (Mesken et al., 2002). Lapses have rarely predicted accident involvement in previous studies (Mesken et al., 2002), but errors seemed to be main predictor of involvement in active accidents among elderly drivers (Parker et al., 2000). However, empirical research about the DBQ factor structure and its relationship with accident involvement has not been studied in Arabic countries before. The aim of the present study was to investigate the factor structure of the DBQ, then to examine the relationships between the factors of the DBQ and accident involvement, and finally to compare DBQ scores between the two gulf countries: Qatar and United Arab Emirates (UAE).

2. Method

2.1. Participants

2.1.1. Qatari driver sample

A multi-stage stratified cluster sampling was applied by using the administrative division of the Qatar into twenty-one Primary Health Care (PHC) Clinics of the State of Qatar. PHCs are approximately equal sized in terms of number of inhabitants. The participants were selected among patients registered and attending eleven PHC Centres (8 urban and 3 semi-urban), which represent over 70% of total visits per year. Qualified nurses and health educators were instructed to structurally interview and complete a questionnaire for randomly selected Qatari men and women during the period from October 2004 to March 2005. One thousand one hundred and ten drivers (263 female and 847 male) participated in this study. 80.5% of drivers reported that they had been involved in at least one traffic accident.

2.1.2. United Arab Emirati drivers

A cross-sectional survey was conducted the period from January to July 2002 in the Al Ain City, Abu Dhabi and Dubai cities in the UAE. A multi-stage stratified cluster sampling design was developed using an administrative division of the UAE into three cities of approximately equal size in terms of number of inhabitants. In order to ensure a representative sample of the study population, the sampling plan was stratified with proportional allocation according to stratum size. Stratification was based upon geographical location. With 2.5% error bound and 99% confidence limit the required sample size was estimated as 1800 drivers. The participants were sampled from each region so that the sample size in each region was proportional to its share of total population in the Emirates. A health educator and social workers recorded the data of each subject on a standardized questionnaire. A representative sample of 1800 UAE drivers was selected and approached while renewal of car registration. The sample included males and females aged 18 years and above. A total number of 1286 Arabian Emirati drivers (294 females and 992 males) took part in the study (Bener et al., 2007). 55.8% of drivers reported that they had been involved in at least one traffic accident. All participants had driving licenses and were assured of anonymity and confidentiality. The participants filled out the DBQ and items related to drivers' driving records and demographic variables. Although the sampling strategy was different in the two studied countries, the Driver Behaviour Questionnaire was the tool used to investigate the relationship between self-reported driving questionnaire and crash involvement in both countries.

2.2. Measures

2.2.1. Aberrant driver behaviours

DBQ with extended violations was used to measure aberrant driver behaviours (Lajunen et al., 2004; Lawton et al., 1997). An Arabic version of the DBQ was revised by the bilingual co-investigator and back translated by another bilingual expert. The translators made together the necessary corrections, modifications and rewording after considering the minor differences and discrepancies. The extended version of the DBQ includes aggressive and ordinary violations (10 items, e.g. "disregard speed limit on motorways"), lapses (8 items, e.g. "forget where you left your car in the car park", and errors (8 items, e.g. "misjudging the speed of another vehicle when overtaking"). Two violations items were dropped because of cultural or structural factors (e.g., drinking and driving, and "pulling out of, force your way"). Gras et al. (2006) also suggested that "pulling out of, force your way" item might be omitted from future research because of its instability across the DBQ factors. Two violations items were also revised after getting feedback from drivers. "Disregard speed limits on a residential road" was revised as "disregard the speed limits late at night or early in the morning". "Drive close to the car in front, making it difficult to stop in an emergency" was revised as "Drive especially close to the car in front as a signal to its driver to go faster or get out of the way". Participants were asked to indicate how often they committed each of the 26 behaviours in the previous year on a six-point scale (0 = never, 1 = hardly ever, 2 = occasionally, 3 = quite often, 4 = frequently, and 5 = nearly all the time).