A Study of Contemporary Modifications to the Manchester Driver Behaviour Questionnaire for Organisational Fleet Settings

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Introduction

DBQ and the Present Driving Context

The Manchester Driver Behaviour Questionnaire (DBQ) is increasingly becoming one of the most prominent measurement scales to examine self-reported driving behaviours (Lajunen & Summala, 2003). For example, the DBQ has been extensively utilised in a range of driver safety research areas, such as: age differences in driving behaviour (Dobson et al., 1999), the genetics of driving behaviour (Bianchi & Summala, 2004), cross cultural studies (Lajunen et al., 2003) as well as factors contributing to accident involvement (Dobson et al., 1999; Meksen, Lajunen & Summala, 2002; Parker et al., 1995) and demerit point loss (Davey et al., 2007). Furthermore, the versatility of the DBQ has also been demonstrated via the utilisation of the instrument in a number of countries, including China (Xie & Parker, 200), Australia (Davey et al., 2006; Dobson et al., 1999; Newnam, Watson & Murray, 2004), New Zealand (Sullman, Meadows & Pajo, 2002), Finland (Bianchi & Summala, 2004; Mesken et al., 2002), and the United Kingdom (Parker et al., 1995; Parker et al., 2000).

The popularity of the DBQ to assess current driving performance is also reflected in the considerable evolution of the scale since its inception. The original DBQ was developed by Reason et al. (1990) and focused on two distinct driving behaviours that were identified as errors and violations. Errors were believed to consist of actions that are not planned (e.g., mistakes and misjudgements), while violations were considered to be deliberate deviations from safe driving behaviours (e.g., speeding). However, an additional factor referred to as "slips and lapses" was also developed that focused on attention and memory failures, which were traditionally not considered to affect overall road safety. Specifically, such behaviours were associated with attention and memory problems, while errors include more serious mistakes such as failures of observation and misjudgement (Lajunen & Summala, 2003).

The original DBQ scale has undergone further modification by Lawnton et al. (1997), incorporating additional items to assess other factors that have been proposed to contribute to driving violations. For example, aggressive violations items have been included in the questionnaire and focus on an interpersonal aggressive component such as showing or exhibiting frustration. However "ordinary" violations remained within the scale and consist of aberrant driving behaviours that do not have an aggressive aim e.g., speeding behaviours. Taken together, currently the scale distinguishes between two forms of violations that are Highway code violations (e.g., speeding & running red lights) and Interpersonal aggressive violations (e.g., chasing another motorists when angry & sounding one's horn). A closer examination of the definitions reveal that highway code violations focus on gaining an advantage such as speeding and engaging in risky overtaking manoeuvres while aggressive violations are more hostile in nature and are usually directed towards other motorists.

In addition to the considerable level of modification of DBQ items, there has been a high level of variation within the literature regarding the number of factors identified from using the DBQ. Firstly, some earlier research confirmed the original three factors of errors, violations and lapses (Adberg & Rimmo, 1998; Blockey & Hartley, 1995; Parker et al., 1995). For example, Aberg and Rimmo (1998) identified inattention and inexperience error factors from a large group of Swedish drivers, but overall found the same factor structure. In contrast, there has been evidence of four factors reported by Sullman et al. (2002) that focused on errors, lapses, aggressive violations and ordinary violations. Similarly, Lajunen et al. (2003) identified four factors with a group of UK drivers, and Mesken et al. (2002) reported four factors (errors, lapses, speeding & interpersonal violations) when examining the driving behaviours of Finish motorists. In addition to the different number of factors identified, research has generally reported differences in factor structure, as specific items often load on different factors depending on the driving context (Davey et al., 2006), which ultimately influences the *naming* and interpretation of each factor. Despite such variability, previous applied research has demonstrated that the DBQ is robust to minor changes to some items that have been made to suit specific cultural and environmental contexts (Blockey & Hartley, 1995; Davey et al., 2007; Ozkan & Lajunen, 2005; Parker et al., 2000). As highlighted above, the DBQ has been utilised in a number of motorised countries and has thus been translated and modified to tailor a vast array of driving situations.

Professional Drivers and Fleet Safety

Despite the tremendous amount of research that has utilised the DBQ to investigate general motorists' driving behaviours, there is currently only a small (but expanding) body of knowledge regarding the self-reported driving behaviours of those who drive on public roads for professional reasons (Davey et al., 2006; Newnam et al., 2002; Newnam et al., 2004; Sullman et al., 2002; Xie & Parker, 2002). That is, relatively little research has endeavoured to examine the driving behaviours of those who drive company sponsored vehicles and/or spend long

periods of time behind the wheel (Davey et al., 2006; Newnam et al., 2004) despite this group being at a greater level of risk to accident involvement (Newnam et al., 2002; Sullman et al., 2002), either through increased exposure to the road or as a result of time pressures and other distractions (Stradling et al., 2000). This is lack of research is of particular concern as early estimates suggest work related road incidents cost approximately AUD$1.5 billion (Wheatley, 1997), with the hidden costs somewhere between 3-36 times vehicle repair/replacement costs (Murray et al., 2005).

Similar to above, the small amount of fleet-based research that has utilised the DBQ has also reported a high level of factor structure variability for the measurement tool. For example, Xie and Parker (2002) examined the driving behaviours of professional drivers and identified four factors e.g., violations, lapses and errors. In contrast, Sullman et al. (2002) utilised the DBQ to examine factors associated with crash involvement and reported four factors, while Dimmer and Parker (1999) focused on company car drivers and reported a six factor DBQ structure. One of the few Australian studies by Davey et al. (2006) utilised the DBQ to examine the behaviours of a group of fleet drivers and reported a traditional three factor solution of errors, aggressive and speeding violations, although it is noted that a greater number of traditional items considered to be speeding violations actually loaded on the aggressive violation factor. That is, the aggressive violations factor consisted of a mixture of emotion-oriented responses to driving situations and traditional highway code violations.

Contemporary DBQ Modifications

When considering that the work vehicle may be increasingly becoming an extension of the office (e.g., taking phone calls), the process of multitasking while driving and time pressures placed on drivers may yet prove to have a direct impact on driving performance (Davey et al., 2006). As a result, there appears an opportunity to identify additional contemporary factors that may influence professional driving performance, such as fatigue, time pressure and multi-tasking (e.g., driving and eating and/or mobile phone use) and determine what impact, if any, such issues have on driving performance. Therefore, the present research aims to extend the traditional DBQ by including contemporary items to the traditional 20-item measurement tool and investigate the utility of the additional items in predicting aberrant driving behaviours. More specifically, the study endeavoured to:

a) examine the factor structure of the DBQ after inclusion of contemporary fleet driving items; and

b) investigate the relationship the modified DBQ has with self-reported crash involvement and traffic offences.

Method

Participants

A total of 443 individuals volunteered to participate in the study who were all employees of a large insurance company in Australia. There were 345 (78%) males and 98 (22%) females. The average age of the sample was 44 years (range 18-68yrs). Participants were located throughout Australia in both urban and rural areas. The largest proportion of vehicles driven by participants were reported to be for tool of trade (56%), although vehicles were also salary sacrificed (43%), and a small proportion were leased or participant's own vehicle (1%). Vehicles were reported to be sedans (85%), four wheel drives (12%) or other (3%). The majority of driving by participants was reported to be within the city (46%), or in the city and on country roads (40%). On average participants had held their licence for 26 years (range 5 – 48yrs), had been driving a work vehicle for approximately 5 years (range 1 – 33yrs), with the largest proportion driving between 11 and 20 hours per week (43%), and between 30,000 – 40,000kms per year.

Materials

Driver Behaviour Questionnaire (DBQ)

A modified version of the DBQ was used in the current study that consisted of 35 items. Similar to previous research, questions relating to lapses were omitted due to earlier evidence that has indicated this factor is not associated with crash involvement (Lawnton et al., 1997; Stradling, Personal Communication, 2003). In addition to the traditional 20 items incorporated with the DBQ, the authors of the current paper also included another 15 items that focused specifically on contemporary fleet safety issues such as fatigue, tiredness and multitasking. These items were derived from the implementation of focus groups with fleet drivers from a number of large Australian fleet organisations which facilitated the identification of key themes proposed to influence driving performance such as fatigue, tiredness, multi-tasking and general distraction. Some of the added items were "*Drive while under time pressure*", "*eat a meal while driving for work*" and "*drive while using a mobile phone*". Respondents were required to indicate on a six point scale (0 = never to 5 = nearly all the time) how often they commit each of the errors (8 items), highway code violations (8 items) aggressive items (4 items), as well as the additional 15 items. See Appendix One for a complete list of the additional questions.

Demographic Measures

A number of socio-demographic questions were included in the questionnaire to determine participants' age, gender, driving history (e.g., years experience, number of traffic offences and crashes) and their weekly driving exposure (e.g., type of car driven, driving hours).

Procedure

The vehicle insurance company provided a list of individuals who expressed interest in participating in the research. A letter of introduction, the study questionnaire and a reply paid envelope was distributed through the company's

internal mail system to the participants. In total 1440 were mailed to fleet drivers and 443 were returned, which indicates a 30% response rate.

Results

Factor Structure and Reliability of the Driver Behaviour Questionnaire for an Australian Sample

The internal consistency of the original DBQ factor scores were examined through calculating Cronbach's alpha reliability coefficients, which are presented in Table 1. Similar to previous Australian research (Blockey & Hartley, 1995; Dobson et al., 1999), and professional drivers (Sullman et al., 2002), the factors appear to exhibit relative internal consistency. Examination of the scores reveals that the items traditionally associated with highway code violations indicate the highest reliability coefficients (.80) while aggressive violations, which consisted of only 4 items, had the lowest reliability (.60).

Table 1. *Alpha reliability coefficients of the DBQ scale*

	Current Sample	Sullman (2002)
Errors (8 items)	.77	.71
Highway Code Violations (8 items)	.80	.62
Aggressive Violations (4 items)	.60	.57

Self-Reported Frequent Driving Behaviours

Table 2 reports the overall mean scores for the three factors, revealing that participants reported a similar frequency for each of the driving categories, although further analyses indicated highway code violations occurred significantly more frequently than errors $F(1, 443) = 80.73$, $p < .01$ as well as aggressive violations $F(1, 433) = 94.42$, $p < .01$. The means are higher than previous research that has focused on college students (Bianchi & Summala, 2004) elderly drivers (Parker et al., 2000), and professional drivers (Sullman et al., 2002; Xie & Parker, 2002), indicating that the current sample engaged in, or at least reported, a higher level of aberrant driving behaviours[1]. In addition, Table 2 reports the mean and standard deviation scores for the four highest ranked items from the complete 35 item questionnaire, which were: *Drive while under time pressure* ($M = 2.79$, $SD = 1.20$); *Drive while tired* ($M = 2.68$, $SD = 1.10$); *Exceed the speed limit on a highway* ($M = 2.62$, $SD = .93$) and *Find your attention being distracted from the*

[1] However, it is noted that the DBQ questionnaire utilised in the current study most likely varies slightly on the wording of some items compared to previous DBQ research, which should be borne in mind when making comparisons with previous research.

road (*M* = 2.26, *SD* = .83). The results indicate that while speeding remains one of the most common forms of aberrant behaviour reported by the fleet drivers (Newnam et al., 2004; Sullman et al., 2002), drivers are also at risk of driving while fatigued, tired or while distracted.

Table 2. *Mean Scores for the DBQ factors*

	M	*SD*
Errors (8 items)	1.61	.37
Highway Code Violations (8 items)	1.70	.58
Aggressive Violations (4 items)	1.53	.48
Highest Ranked Items		
1. Drive while under time pressure	2.79	1.20
2. Drive while tired	2.68	1.10
3. Exceed the speed limit on a highway	2.62	.93
4. Find your attention being distracted from the road	2.26	.83

Factor analysis was administered on the complete 35 item questionnaire. Principal components analysis with oblique rotation was implemented to determine the factor structure of the DBQ, which revealed a three-factor solution that accounted for 49% of the total variance. The first factor accounted for approximately 31% of the total variance and contained nine items relating to a combination of Highway code violations and some Aggressive violations. Firstly, 7 Highway code violation items loaded on the factor, with the first 5 speeding items identified as the strongest contributors to the factor (e.g., *Race away from traffic lights, drive especially close, speed on residential road,* etc). Secondly, similar to previous research (Davey et al., 2006), some aggressive items also loaded on the speeding factor. However, this factor was labelled Highway code violations as the predominant theme to collectively emerge from the items focuses on speeding behaviours.

The second factor accounted for 10% of the total variance and contained 9 of the new items that centred on a combination of fatigue and distraction issues, such as driving while tired, nodding off while driving and driving on autopilot. It is noted that some additional items that may be perceived as being associated with multitasking and time pressure were also evident within this factor such as eating a meal while driving and saving time during the day by driving quicker between jobs. While it was originally anticipated that Fatigue and Multi-tasking items would be represented in distinct factors, this did not occur in the current sample of drivers. Rather at this stage, the factor was labelled *Fatigue* as the largest proportion of items relate to symptoms that result from this experience, although it is noted that closer analytic scrutiny could produce a different interpretation. Finally, the third factor accounted for approximately 8% of the overall variance and comprised of 11 items, the majority associated with traditional error items e.g.,

miss a stop or giveway sign, nearly hit a car and skid while breaking. However it is also noted that 1 traditional aggressive item also loaded on the factor (e.g., become angered by another driver and give chase) and three new items, two of which focused on non-seat belt wearing and one on multitasking. All items and factors for the modified DBQ are reported in table 3.

Table 3. Factor structure of the modified DBQ

Description	F1	F2	F3
Race away from traffic lights to beat car beside you	.73		
Drive especially close to the car in front to signal drive faster	.64		
Disregard speed limit on a residential road	.62		
Disregard speed limit on a highway or freeway	.62		
Stay in a closing lane and force your way into another	.57		
Become angered by another driver and show anger	.55		
Cross junction knowing the traffic lights have already turned	.54		
Become impatient by slow driver and overtake on inside	.52		
Sound your horn to indicate your annoyance at another driver	.41		
Drive while tired		.79	
Have difficulty driving because of tiredness or fatigue		.79	
Find yourself nodding off while driving for work		.66	
Drive while under time pressure		.64	
Find yourself driving on autopilot		.63	
Save time during the day by driving quicker between jobs		.61	
Eat a meal while driving for work		.54	
Find your attention being distracted from the road	.41	.54	
Drive home from work after a long day		.44	
Nearly hit a cyclist while turning			.63
Not wear your seatbelt			.63
Remove your seatbelt for some reason while driving			.60
Become anger by another driver and give chase			.58
Skid while breaking or cornering on a slippery road			.55
When overtaking underestimate speed of oncoming vehicle			.52
Attempt to overtake someone you had not noticed turning			.52
Miss stop or giveway sign			.49
Pull out of junction so far that you disrupt traffic			.48
Nearly hit another car while queuing to enter a main road			.45
Do paperwork or other administration work while driving			.41
Fail to notice pedestrian crossing in path			.40

Note: Five questions did not load which were: (a) Have one or two alcoholic drinks before driving for work, (b) Fail to check rear-view mirror, (c) Drive while using a "hands-free" mobile phone, (d) drive while using a "hand-held" phone and (e) do paper work or admin while driving.

Reliability and intercorrelations of the Modified Driver Behaviour Questionnaire
The internal consistency of the Modified DBQ scale scores were examined through calculating Cronbach's alpha reliability coefficients. The resulting analysis indicated internal consistency of: .82 = Speeding/Aggression, .76 = Fatigue, .69 = Errors. In addition, bivariate analysis indicated that the strongest relationship was between Speeding and Errors (r = .58**), followed by Fatigue and Errors (r = .52**) and then Fatigue and Speeding (r = .50**). Interestingly, there was only a moderate bivariate relationship between Fatigue and hours driven per week (r = .20**) or number of kilometres driver per year (r = .24**).

Prediction of Offences
The final part of the study aimed to examine the utility of the Modified Driver Behaviour Questionnaire to predict self-reported work crashes as well as demerit point loss. Due to the relatively small number of participants who reported a work-related crash in the last 12 months (N = 48), it was not possible to implement regression analyses and thus the following analyses focus on predicting work-related driving infringements (N = 73). A logistic regression analysis was performed to examine the contributions of the three factors (e.g., Speeding/Aggression, Fatigue/Tiredness & Errors) as well as driving exposure (e.g., kilometres driven each year & hours driving per week) to the prediction of self-reported infringements in the past 12 months.

Table 4 depicts the variables in each model, the regression coefficients, as well as the Wald and odds ratio values. Self-reported number of kilometres driven each year and hours of driving per week were entered in the first step to examine, as well as control for, the influence of driving exposure before the inclusion of the DBQ factors. As expected, the number of kilometres driven per year was predictive of incurring demerit point loss (p = .000) as those who drive longer distances are at a greater risk.

Next, the three Modified DBQ factors were entered in the model to assess whether the proposed behaviours improved the prediction of demerit point loss over and above exposure to driving (Step 2). The additional variables collectively were significant, with a chi-square statistic of X^2 (4, 3 = 443) = 10.89, p = .005, as was the Fatigue variable. The model indicates that as participants' become more tired and/or lose concentration, the corresponding likelihood of engaging in infringements that results in demerit point loss increases (p = .030). Several additional regression models were estimated to determine the sensitivity of the results. A test of the full model with all six predictors entered together, as well as the two models entered separately, confirmed the same significant predictors (e.g., exposure and Fatigue). Forward and Backward Stepwise Regression identified the

same predictors. Inclusion of gender, age and years driving experience did not increase the predictive value of the model.

Table 4. Logistic Regression

Variables	B	SE	Wald	*p*	Odds ratio Exp (B)	95% CI Lower	95% CI Upper
Step 1							
Hours per week	-.148	.18	.58	.447	.87	.61	1.24
Kms per year	.36**	.10	14.18	.000	1.42	1.19	1.72
Model Chi-Square 16.65** (df = 2)							
Step 2							
Hours per week	-.19	.19	1.02	.312	.87	.57	1.20
Kms per year	.34**	.09	11.47	.001	1.39	1.15	1.70
Speeding/Agress	.27	.26	1.09	.924	1.05	.39	2.92
Errors	.05	.52	.01	.702	1.05	.81	1.35
Tiredness/Fatigue	.466	.215	4.69	.030	1.56	1.046	2.431
Model Chi-Square 25.49** (df = 5)							
Block Chi-Square 12.89** (df = 3)							

Discussion

The present research aimed to explore possible contemporary changes to the DBQ for utilisation within organisational fleet settings. More specifically, the present paper reports on an attempt to add additional contemporary driving behaviour items (e.g., fatigue and multi-tasking) to the traditional DBQ in order to increase the utility of the measurement tool in examine and predict aberrant driving behaviours. At present, the DBQ has become increasingly popular as a measurement tool to investigate motorists' self-reported driving behaviours (Lajunen et al., 2003; Parker et al., 1995) as well as determine what driving behaviours are directly related to increased risk of crash involvement (Parker et al., 1995). However, within the professional driving setting, only a small body of research has begun to examine the driving behaviours of professional drivers (Newnam et al., 2004; Willis et al., 2004) and there has been little examination of necessary measurement tools to accurately capture their driving experiences and perceptions.

Firstly, reliability analysis of the original DBQ indicated coefficients that were relatively robust and similar to both the small amount of previous Australian research (Blockey & Hartley, 1995; Dobson et al., 1999) and recent fleet safety

findings (Sullman et al., 2002). Encouragingly, despite the subtle alterations to the DBQ to reflect Australian driving conditions, the reliability of the scale appears acceptable. Secondly, examination of the overall mean scores for the original DBQ factors revealed similar scores between the constructs, although it appears that the current sample were most likely to engage in highway code violations. This finding is consistent with previous research that has indicated speeding to be the most frequently reported aberrant driving behaviour on public roads (Dimmer & Parker, 1999; Lajunen et al., 2003; Parker et al., 2003). Furthermore, given the time pressures often placed on professional drivers, it may not be surprising that speeding violations are the most common form of aberrant behaviour both exhibited and reported by fleet drivers.

However, once the additional items were analysed that focused on fatigue, tiredness and multitasking, it became evident that participants in the current sample were most likely to report driving while under time pressure as well as driving while tired, followed by exceeding the speed limit on the highway. While only preliminary, the results indicate that although speeding remains one of the most common forms of aberrant behaviour reported by the fleet drivers (Newnam et al., 2004; Sullman et al., 2002), drivers are also at risk of driving while fatigued, tired or while distracted.

A series of factor analytic techniques were implemented to assist with the interpretation of the scale scores. Both exploratory and oblique rotations produced five factor models. While some previous studies has reported five factor structures (Parker et al., 2000), the present factors were difficult to interpret, which resulted in a 3 factor solution being sought. This endeavour proved fruitful as 3 factors emerged that generally consisted of errors, highway violations/aggressive violations and the Fatigue/Tiredness factor. The three factor model was relatively consistent with previous research that has found distinctions between the different aberrant driving behaviours (Lajunen et al., 2003; Sullman et al., 2002). Driving errors was the clearest factor to interpret and appeared to be associated with failures of observation and judgement, while general highway violations were characterised by items that were a combination of traditional speeding behaviours as well as some aggressive acts. It is noteworthy that some of the highway violations that loaded on this factor may be interpreted as aggressive violations, especially for experienced professional drivers. For example, while driving especially close to a car in front of you to indicate for them to drive faster and crossing a junction knowing that the lights have already turned against you have traditionally been considered to be highway violations, they may also constitute an aggressive behaviour or at least indicate some level of frustration. Thus, behaviours traditionally viewed as highway violations may be classified as aggressive and aberrant, or at least, may originate from emotions associated with frustration. However, it is also noted that a temporality issue may be evident as aggressive violations in any current context may result in speeding violations (e.g., highway violations) within a matter of moments.

The third factor consisted purely of the additional items that focused on themes associated with tiredness, fatigue, loss of concentration and distraction. Taken together, the themes can be considered quite broad and thus identifying a clearly definable title for the factor proved difficult. As highlighted previously, while it was originally anticipated that Fatigue and Multi-tasking items would be represented in distinct factors, this did not occur in the current sample of drivers. Nevertheless, the writers believe that an overall component of the factor is driving while fatigued, as some form of relationship may be identified between many of the individual items and the subsequent condition of being tired and at risk of losing concentration. However, five additional questions did not load on the factors, and of particular note was that of mobile phone use. While the two items relating to "hands-free" and "hands-held" phone use was not clearly interpretable in the current factor structure, further research appears needed to determine whether this finding is specific to the current sample or if phone use is not a contemporary fleet driving issue that does not impact on driving outcomes.

The corresponding calculation of cronbach's alpha reliability coefficients for the new factors (Speeding/Aggression, Errors and Fatigue) revealed higher reliability scores than for the traditional item loading structure calculated before the factor analytic technique[2]. However, the item-loading characteristics of the current study may be influenced by a number of additional issues such as the specific characteristics of the sample. In addition, the lack of research into fleet drivers combined with the difficulties interpreting the factor structure within the current study may indicate that individuals who drive for work, especially fleet drivers, are a special population who experience and exhibit different driving behaviours to the general motoring population. Given that the factor structure of the DBQ has varied considerably (e.g., 3 to 6 factors) in different countries and different settings, situational and cultural factors need to be taken into account when utilising the DBQ (Lajunen et al., 2003).

Finally, in regards to the prediction of self-reported driving offences and crashes, only a small proportion of the sample reported being in a crash within the last year, which contributed to difficulties identifying factors associated with the event. Subsequently, an examination of self-reported driving violations through step wise logistic regression analysis revealed that both exposure to the road and reporting symptoms of fatigue (e.g., tiredness & loss of concentration) were predictive of incurring driving violations. Firstly, exposure to the road was expected to be a significant predictor given that increasing driving distances is likely to increase the probability of deliberately or unintentionally making driving errors which may lead to demerit point loss. Secondly, fatigue was also identified as a predictor of demerit point loss and is of particular importance. Not only was driving while fatigued and driving tired the most commonly reported behaviours by the sample,

[2] Although this is to be expected as chronbach's alpha usually increases with the inclusion of additional items.

but this factor also predicted demerit point loss, over and above, exposure to the road. Given that feeling fatigued and making driving errors may be considered one of the most likely methods to incur infringement notices, it may not be surprising that driving under pressure and feeling tired are predictive of fines. Interestingly, there was only a moderate bivariate relationship between Fatigue and exposure to the road, although it is possible this anomaly is specific to the current sample. Nevertheless, future research that identifies the particular reason for motorists' demerit point loss (e.g., errors vs deliberate acts) may provide for a more refined analysis to determine the specific contribution of fatigue to driving infringements and even crash involvement. Despite this, the current study provides preliminary evidence that driving under pressure and the associated feelings and behaviours of fatigue may warrant further investigation within fleet settings.

A number of limitations should be taken into account when interpreting the results of this study. The response rate of participants was relatively low, but consistent with previous research utilising the DBQ scale in Australia (Dobson et al., 1999). Similar to research in this area, concerns remain regarding the reliability of the self-reported behaviour, such as the propensity of professional drivers to provide socially desirable responses. Questions also remain about the representativeness of the sample as participants were mainly corporate fleet drivers (e.g., involved in insurance sales) and such driving styles may not be easily transferable to other fleet driving populations. In summary, further research is required to establish the predictive utility of including additional items in the DBQ which are fleet specific such as fatigue and multitasking. The present study has provided some additional preliminary evidence that modifying the DBQ to suit applied settings can produce favourable results in regards to identifying the factors that influence the driving task.

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