Utilising the Driver Behaviour Questionnaire

in an Australian Organisational Fleet Setting: are modifications required?

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Abstract

This study reports on the utilisation of an adapted Manchester Driver Behaviour Questionnaire (DBQ) to examine the self-reported driving experiences of a group of Australian fleet drivers (N = 443). Surveys were posted to participants who agreed to participate in the study. While exploratory and oblimin factor analysis did not produce clear factor loadings, a three factor solution, using parallel analysis, was obtained that supports previous research demonstrating the distinction between different driving conduct (e.g., errors, highway code violations and aggressive driving violations). The questionnaire appeared to remain psychometrically robust despite minor word modifications to reflect the Australian driving environment. However, a larger number of items traditionally related with highway code violations were found to be associated with aggressive driving acts among the current sample. Further analysis exploring factors associated with self-reported traffic violations revealed that DBQ factors were negatively related with aberrant driving behaviours, although at a multivariate level only the number of kilometres driven each year (e.g., exposure) proved to be predictive of incurring fines/demerit points. Taken together, the results indicate that the DBQ can be successfully implemented within an Australian fleet setting to examine professional drivers' behaviour(s).

Key words: Driver Behaviour Questionnaire (DBQ), fleet drivers, road safety.

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Present Context

A growing body of research is indicating that a considerable proportion of motorists are being exposed to aggressive, violent and/or reckless behaviours on public roads (Automobile Association, 1995; Lajunen, Parker & Stradling, 1998; Underwood et al., 1999). These behaviours are of concern as research is now demonstrating a link between aggressive driving violations and increases in the risk of crash involvement (Dobson et al., 1999; Parker et al., 1995; Reason et al., 1990; Underwood et al., 1999). For instance, intentional driving violations have been found to be a significant predictor of involvement in accidents (Parker et al., 1995; Xie, Parker & Stradling, 2002). As a result, research is presently focusing on identifying the causes of aggressive and violent driving behaviours (Lajunen & Parker, 2001; Lajunen et al., 1998; Underwood et al., 1999) and the subsequent impact these behaviours have on road safety (Parker et al., 2000; Parker et al., 1995; Sullman et al., 2002).

Driver Behaviour Questionnaire

One of the most widely implemented measurement scales to examine self-reported aberrant driving behaviours is the Manchester Driver Behaviour Questionnaire (DBQ) (Lajunen & Summala, 2003). The DBQ is essentially an assessment tool designed to identify and classify aberrant driving behaviours into specific categories, which can be utilised by both researchers and industry personnel (i.e., fleet managers) to investigate drivers' behaviours as well as examine the factors associated with crashes and infringements. While the original DBQ only focused on two distinct behaviours that were named errors and violations (Reason et al., 1990), the scale has been continually modified to now include "slips and lapses" (Lajunen & Summala, 2003), as well as a greater level of distinction between ordinary and deliberate violations that are now identified as Highway code violations and Interpersonal aggressive violations. For example, Highway code violations consist of behaviours such as speeding and running red lights, while Interpersonal aggressive violations focus on specific aggressive behaviours that include sounding one's horn or chasing another motorist when angered (Lawton et al., 1997).

In conjunction with the considerable modifications to the DBQ, the scale has been successfully implemented in a number of countries including; Finland (Bianchi & Summala, 2004), Netherlands (Lajunen et al., 2003), UK (Parker et al., 2000), New Zealand (Sullman, Meadows & Pajo, 2002), China (Xie & Parker, 2002) and Australia (Dobson et al., 1999). Researchers have utilised the DBQ to focus on a range of research areas including; the genetics of driving behaviour (Bianchi & Summala, 2004), driving age groups (Dobson et al., 1999), issues associated with self-report bias (Lajunen & Summala, 2003), cross cultural studies (Lajunen & Summala, 2003) and associations with the likelihood of being involved in an accident (Dobson et al., 1999; Parker, Reason et al., 1995; Reason et al., 1990). This body of research has identified various factor structure patterns that have either confirmed the original three factors of errors, violations and lapses (Aberg & Rimmo, 1998; Blockey & Hartley, 1995; Parker, Reason et al., 1995; Xie et al., 2002) four factors that are errors, lapses, aggressive and ordinary violations (Sullman et al., 2002), or five factors (Parker et al., 2000). Notwithstanding the general consistency of the factor

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11 A professional driver in the current context is defined as a person whose requirement to drive is a central component of their work role.

structure, cross-cultural implementation of the DBQ has highlighted different "national scoring keys" and changes in the number of items used in the scale, as well as the wording of some questions (Lajunen et al., 2003).

Professional Drivers and Fleet Safety

In contrast to the above mentioned quantity of studies, a smaller body of research exists that has endeavoured to examine the self-reported driving behaviours of professional drivers and individuals who drive company sponsored vehicles and/or spend long periods of time behind the wheel (Newnam et al., 2002; Newnam et al., 2004; Sullman et al., 2002; Xie & Parker, 2002)[11] . Despite this, a growing body of research has demonstrated company car drivers are at a greater risk of accident involvement (Newnam et al., 2002; Sullman et al., 2002), not only through higher levels of exposure to the road environment, but also time and scheduling pressures, and other distractions (Stradling et al., 2000). In addition, research that has focused on occupational driver assessment has begun to examine the relationship driving performance has with physical activity (Taylor & Dorn, 2005), driver stress (Dorn & Matthews, 1992; Matthews et al., 1998), information systems (Saricks, Schofer, Soot & Belella, 1997) as well as methods to accurately measure risk assessment (Murray & Dubens, 2001; Rea et al., 2004).

Similar to above, one issue to emerge from the current research is the variation in the number of identified DBQ factors. For example, research that has focused on taxi, bus, and company drivers have identified three factors (Xie & Parker, 2002), truck driving research has demonstrated four factors (Sullman et al., 2002), and earlier research that has focused exclusively on drivers of company vehicles have reported six factors (Dimmer & Parker, 1999).

In regard to fleet safety within Australia, research has yet to utilise the complete DBQ to examine large groups of professional drivers' self-reported driving to; (a) determine drivers' self-reported driving behaviours and (b) the relationship such behaviours have with accident involvement rates. What remains evident is that considering the tremendous amount of kilometres driven by professional drivers within Australia each year, there is a genuine need to examine the usefulness of the DBQ scale to assess driving behaviours, as well as determine the relationship DBQ factors have with the likelihood of crash involvement and traffic offences. As a result, the present research aimed to utilise a modified version of the DBQ to investigate the self-reported driving behaviours of a group of Australian drivers within a fleet setting. More specifically the study endeavoured to:

(a) determine whether the DBQ is psychometrically robust to accommodate for small changes to some items to reflect Australian fleet safety driving conditions;

(b) examine the factor structure and generalisability of the DBQ to a sample of professional Australian drivers; and

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

METHOD

Participants

A total of 443 individuals volunteered to participate in the study. There were 345 (78%) males and 98 (22%) females. The average age of the sample was 44 years. 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 participants' 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, had been driving a work vehicle for approximately 5 years, with the largest proportion driving between 11 and 20 hours per week (43%).

Materials

Driver Behaviour Questionnaire (DBQ)

The Driver Behaviour Questionnaire (DBQ) was utilised that aims to measure three main forms of aberrant behaviours that are errors, highway and aggressive violations. However the DBQ version in the current study consisted of 23 items, as questions relating to lapses were omitted due to previous research indicating that this factor is not associated with crash involvement (Lawton et al., 1997). In addition, the authors of the current paper modified the wording of 12 items to make the measures more generalisable to Australian driving conditions e.g., remove specific references to either turning right or left in some items.

Furthermore, as researchers have previously noted that interpretation difficulties may exist between ordinary and aggressive violations due to the intention behind the act (Lajunen & Parker, 2001; Lajunen et al., 1998), the authors of the current paper expanded three items to specifically address this issue. That is, questions relating to speeding on highway/residential roads and disobeying stop signs were

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12 Sullman et al. (2002) examined the self-reported aberrant driving behaviours amongst New Zealand truck drivers.

duplicated to examine the differences between intentional and unintentional versions of the offence. The aim was to attain a clearer definition of the aberrant behaviour and attempt to examine the underlying intention behind the behaviour i.e., deliberate vs unintentional. Respondents were required to indicate on a six point scale (0 = never to 6 = nearly all the time) how often they commit each of the errors (10 items), highway code violations (9 items) aggressive violations (4 items).

Demographic Measures

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

Procedure

A large Australian motor vehicle insurance company expressed interest in participating in the program of research. A letter of introduction, the corresponding questionnaires and a reply paid envelope were distributed through the company's internal data base to all employees, who were encouraged to participate in the research project. In total 1440 were mailed out and 443 were returned indicating a 30% response rate.

RESULTS

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

The internal consistency of the DBQ scale 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 research on professional drivers (Sullman et al., 2002), the factors appear to exhibit relative internal consistency. The results also suggest that the scale is relatively robust to minor wording changes to items to reflect Australian driving conditions. A closer examination of the questionnaire reveals that the items traditionally associated with highway code violations demonstrate the highest reliability coefficients (.80) while aggressive violation, which consist of only 4 items, have the lowset reliability (.60).

Table 1. Alpha reliability coefficients of the DBQ scale

	Current Sample	New Zealand Study[12]
Errors (10 items)	.77	.71
Highway Code Violations (9 items)	.80	.62
Aggressive Violations (4 items)	.60	.57

Table 2 depicts the overall mean scores for the three factors, revealing that participants reported a similar frequency for each of the driving categories, although highway code violations appear to be exhibited most regularly. 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). In addition, table 2 depicts the mean and standard deviation scores for the three highest ranked items, which were: Exceeding the speed limit on a highway without realising it (M = 2.62, SD = .94), Exceeding the speed limit on a residential road without realising it (M = 2.26, SD = .83), and Intentionally disregard the speed limit on a highway (M = 2.19, SD = 1.14). The results indicate that speeding is the most common form of aberrant behaviour reported by the fleet drivers in the current sample, and similar to previous research on professional drivers (Sullman et al., 2002), speeding remains one of the major road safety concerns. Secondly, speeding remains the most common aberrant driving behaviour, regardless of whether it is intentional or unintentional.

Table 2. Mean Scores for the DBQ factors

	Sample M	SD
Errors (10 items)	1.61	.37
Highway Code Violations (9 items)	1.70	.58
Aggressive Violations (4 items)	1.53	.48
Highest Ranked Items	2.62	.93
1. Unintentionally exceed the speed limit on highway		
2. Unintentionally exceed the speed limit on a residential road	2.26	.83
3. Intentionally exceed the speed limit on a highway	2.19	1.14

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13 Cronbach's alpha reliability coefficients for the three factors were calculated to be: Aggressive violations (10 items) = .82, Errors (7 items) = .71 & Highway violations (6 items) = .77, which is moderately higher than the original factor structure reported in Table 1.

14 However, it is noted that participants may have not noticed the subtle difference between the two items (e.g., intentional vs unintentional), which may have accounted for the similar loadings.

Table 3. Factor structure of the modified DBQ

Description	F1	F2	F3
Become impatient by slow driver and overtake on inside	.72		
Sound your horn to indicate your annoyance at another driver	.70		
Become angered by another driver and show anger	.69		
Race away from traffic lights to beat car beside you	.61		.38
Drive especially close to the car in front to signal drive faster	.60		
Stay in a closing lane and force your way into another	.52		
Skid while breaking or cornering on a slippery road	.41	.32	
Become angered by another driver and give chase	.40		
Pull out of a junction and so far that your disrupt traffic	.36	.36	
Cross junction knowing traffic lights have already turned	.35		.35
Fail to check rear view mirror when changing lanes		.63	
Miss stop or give way signs		.62	
Fail to notice pedestrians are crossing in your path of traffic		.62	
When overtaking underestimate speed of oncoming vehicle		.60	
Nearly hit a cyclist while turning		.52	
Attempt to overtake someone you hadn't noticed turning		.47	
Nearly hit another car while queuing to enter a main road		.44	
Exceed the speed limit on a residential road without realising it			.75
Exceed the speed limit on highway without realising			.74
Intentionally disregard the speed limit on highway			.71
Intentionally disregard speed limit on a residential road			.63
Drive even though you suspect you are over legal limit			.30
Amount of variance explained	28.7	7.5	6.6

A series of factor analyses were implemented to determine the factor structure of the scale for a group of Australian fleet drivers. A Principal Components Analysis (PCA) with varimax rotation produced five factors that were moderately correlated (>.3 - .7). A direct oblimin rotation also produced a five factor structure that was inherently unstable and uninterpretable. In order to determine the best possible solution of the 23-item DBQ, the number of factors to retain was determined by the use of parallel analysis at both the mean and 95th percentile eigenvalues (see Table 3). PCA with oblique rotation revealed a three-factor solution that accounted for 43% of the total variance.

The first factor accounted for approximately 29% of the total variance and contained ten items relating to a combination of aggressive driving behaviours and some highway violations. Firstly, the four aggressive items loaded on the factor, with three aggressive items identified as the strongest contributors to the factor e.g., becoming impatient, angry and sounding one's horn. Secondly, four traditional highway code items also loaded on the factor. However, it is noted that all four items may also be considered to be an aggressive act in some circumstances such as forcing one's way into traffic and driving especially close to another vehicle. Taken together, this factor was labelled aggressive violations due to the predominant focus on antagonistic aberrant driving behaviours.

The second factor accounted for approximately 7.5% of the total variance and contained 7 items all relating to driving errors, such as missing a stop or give way sign, failure to check rear vision mirror, and failure to notice pedestrians crossing in front of a vehicle. As a result this factor was labelled driving errors. The third factor accounted for approximately 6.6% of the overall variance and comprised items relating predominantly to highway code violations such as intentionally and unintentionally speeding on a highway as well as residential roads. This factor was labelled highway violations as the main focus of the collective items remains on speeding in a variety of situations[13]. It is important to note that four items cross-loaded on more than one factor, with three of these items cross-loading to such an extent that they contained similar weightings across factors. Furthermore, one item failed to load on any one factor e.g., intentionally disobey a stop or give way sign. All items and factors for the 23-item DBQ are reported in table 3.

Expansion of three items

It is of interest to note that although the authors included items relating to intentional and unintentional speeding, the observed factor loadings did not indicate these items reflect driving behaviours relating to highway code violations and errors respectively. Instead, these items were essentially interpreted as a violation regardless of whether the behaviour was intentional or not. Thus, it appears that while speeding may possibly be an error in some circumstances, it seems this aberrant behaviour is a violation among the current sample.[14] Similarly, the possible distinction between intentionally and unintentionally missing a stop sign was also not evident and may result from the item not being specific enough to distinguish between an aggressive act versus a simple error.

Prediction of Offences

Finally, additional analyses were undertaken to determine the relationship between the DBQ factors and involvement in work crashes as well as accumulating demerit points. Only a small proportion of the sample (n = 48, 11%) reported being in a crash within the last year, which resulted in difficulties reliably identifying factors associated with the event. In contrast, 88 drivers (20%) reported incurring fines or demerit points in the past 12 months, and bivariate analyses identified a number of relationships between this event and aberrant driving behaviours. Specifically, positive correlations were identified between participants admitting incurring demerit points and the three DBQ factors, speeding (r = .11*), errors (r = .12*) and aggressive violations (r = .10*), as well as driving a greater number of kilometres per year for work (r = .15**).

To further investigate the relationship between incurring fines/demerit points and fleet safety drivers' aberrant behaviours, a logistic regression analysis was performed to examine the contributions of participants' recent driving experience(s) (e.g., years, kms driven) and their DBQ scores to the acknowledgement of incurring fines or demerit points in the past 12 months while at work.[15] While the overall model was significant (Chi square = 20.69, p = .000), only the number of kilometres proved to be a significant predictor of traffic offences (Wald = 11.80, p = .001), as not surprisingly, individuals who drive greater distances per year are more likely to be involved in traffic violations. Thus, the element of exposure appears to heavily influence the likelihood of drivers incurring fines/penalties. Several additional regression models were estimated to determine the sensitivity of the results. Controlling for kilometres driven, nor inclusion of only the DBQ factors failed to identify further significant models. Forward and Backward Stepwise Regression identified the same predictor. Finally, inclusion of gender, type of work vehicle or driving location did not increase the predictive value of the model. Possible reasons for the failure to identify additional significant factors will be examined in the discussion section.

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15 Self-reported crashes was not utilised as a dependent variable as only a small number of participants reported being involved in a crash during the previous year.

ÍDISCUSSION

The present research aimed to utilise the DBQ to investigate the driving behaviours of Australian motorists within a fleet setting, and in doing so determine whether modifications to the scale to more accurately reflect the Australian driving experience influenced scoring outcomes. A 23 item DBQ scale was implemented in the current study, which expanded three questions from the original scale in an attempt to more accurately distinguish between intentional and unintentional violations and errors (i.e., two speeding items and one item on give way/stops signs).

Firstly, reliability analysis of the 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 factor 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 highway code violations appear to be exhibited most frequently. This finding is consistent with previous research that has indicated speeding to be the most regularly reported aberrant driving behaviour on public roads (Parker, West, et al., 1995; Sullman et al., 2002). 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. This result may also reflect a general belief that minor speeding violations are acceptable in some circumstances and do not pose a serious road safety risk.

A series of factor analytic techniques ultimately identified 3 factors that generally consisted of errors, highway violations and aggressive violations. 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). While driving errors and general highway violations were the clearest factors to interpret, aggressive violations in contrast consisted of a mixture of emotion-oriented responses to driving situations and traditional highway code violations. However, it is noted that the four highway violations that loaded on this factor may be interpreted as aggressive violations, especially for experienced professional drivers. Thus, behaviours traditionally viewed as highway violations may be classified as aggressive and aberrant, or at least, may originate from emotions associated with frustration. Given that fleet drivers spend considerably longer periods of time on the road than the general driving population, this group may be prone to experience and/or exhibit a wider range of aggressive acts, and thus a greater number of items may be required to examine this factor.

A further component of the study aimed to determine whether additional questions that focused on differentiating between intentional and unintentional speeding violations would increase the utility of the scale. For example, researchers have previously noted that interpretation difficulties may exist in different countries as items that focus on violations may be problematic, because the distinction between "ordinary " violations and "aggressive" violations is solely based on the intention behind the act (Lajunen & Parker, 2001; Lajunen et al., 1998). Therefore, the researchers in the current study attempted to more specifically define and measure possible differences and effects of intentions behind the act. However, it appears that the item structure may not have been sufficiently specific to distinguish between violations (i.e., intentional) versus simple errors (i.e., unintentional). Conversely, questions remain whether participants recognised the conceptual difference between the items e.g., deliberately running a stop sign vs unintentionally driving through the signal. Finally, the lack of research into fleet drivers combined with the difficulties interpreting the factor structure may indicate that individuals who drive for work, especially fleet drivers, are a special population who may experience and exhibit different driving behaviours to the general motoring population. Despite this, what appears evident is that while speeding may be an unintentional error in theory, the behaviours remains aberrant among this population.

The third section of the study focused on predictors of traffic offences. At the multivariate level, only the number of kilometres driven per year proved to be a significant predictor of such offences, which suggests that the element of "exposure" to the driving environment is a powerful influence on driving outcomes. While researchers have suggested that individuals who spend longer periods on the road are at a greater risk of crash involvement (Sullman et al., 2002), the current study has indicated that spending longer periods on the road is also associated with a greater risk of incurring fines/demerit points.

In practical terms, the findings of the research project have the potential to assist in the development of targeted interventions aimed at addressing factors contributing to crashes as well as the cumulation of demerit points. Presently, fleet databases predominantly consist of crash statistics and associated data that are usually collected after the event (i.e., crash), with little information collected that may contribute to understanding what driving behaviours contributed to the crash. Utilising the DBQ and other assessment tools provides a proactive organisational method to investigate the type of behaviours exhibited by company drivers as well as offer the potential to identify the types of specific behaviours associated with offences and crashes e.g., speeding violations vs aggressive acts. Importantly, the use of such measures may assist in the development of targeted interventions for professional drivers aimed at reducing the likelihood of a crash before the event occurs, rather than on the traditional post hoc basis. In regards to this study's results, while exposure to the road is not surprisingly the greatest predictor of accumulating demerit

points, the findings also indicate that the professional drivers in the current sample were most likely to engage in speeding behaviours, which may at some level, also contain an aggressive element. In addition, the three DBQ factors of speeding, aggression and errors were all positively related to accumulating a higher number of demerit points in the past year, with each of the three factors appearing to have a similar relationship with being detected for an offence.

Limitations

A number of limitations should be taken into account when interpreting the results. The response rate of participants was not extremely high, but consistent with previous research utilising the DBQ scale in Australia (Dobson et al., 1999). Previous research that has focused on professional drivers has used the 28-item DBQ, while the current study expanded the 20 item scale. 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. As a result, future research may benefit from linking self-report data with participants' driving records. 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. Expanding on this point, further research may also attempt to stratify the data in such a way as to focus on particular groups of individuals within a fleet setting e.g., high vs low risk.

Conclusions

In summary, further research is required to establish the reliability and validity of the DBQ scale for the Australian setting and further endeavours into identifying the factors associated with traffic offences and crashes involvement among both private and professional drivers can only benefit current road safety initiatives.

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Issues of Child Occupant Protection: A Literature Review

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Abstract

Though there have been considerable reductions in child mortality and morbidity due to motor vehicle crashes in the past twenty years, road trauma is still a leading cause of death for children in motorised countries and thus an important health and safety issue in Australia. This review identifies key issues of child occupant protection such as the use of age-appropriate child restraints, effects of misuse of restraints, and rear seating of children. Current research findings, with particular emphasis on Australian data, are discussed in relation to avenues that offer potential for enhancing levels of protection.

Introduction

Australia has long been concerned with protecting car occupants generally and has led the world more recently in child-specific car safety through legislation in relation to the design standards and mandatory use of approved child restraints[1]. However, road trauma is still a leading cause of death and serious injury among children under 15 years of age in Australia[2], responsible for killing 66 children in 2004[3]

and seriously injuring over 900 more[4]. Clearly, while much progress has been made over the past decades, there are still outstanding issues to address. This paper sets out to identify the key issues and review the current state of knowledge in relation to them, with particular emphasis on the Australian perspective and experience.

Child Restraints

One of the most effective ways of protecting light vehicle occupants is the wearing of seat belts. Australia was the first country to legislate the compulsory wearing of seat belts for occupants aged 8 years or over in 1970 in Victoria, with other states quickly adopting similar requirements[5]. For younger passengers, legislation was set in place during the 1970s and early 1980s[5] and has recently become more uniform with the national adoption of the Australian Road Rules during 1999 and early 2000. Currently, all States and Territories require that infants under 12 months old be restrained in an approved child restraint[6]. These incorporate a six point harness and are secured to the vehicle by both an adult seat belt passed through the frame of the restraint as well as a top tether attached to an anchor point in the rear of the vehicle[1]. For newborn babies, restraints are rear-facing until the infant reaches the weight limits specified for the restraint (9-12 kg depending on type)[7]. After this, forward-facing child restraints must be used until the child is at least 12 months old. All other passengers travelling in motor vehicles in Australia are required to be appropriately restrained in either approved child-specific restraints or seat belts[6].