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Evaluation of the 2010 child restraint legislation in Queensland

**Prepared by Alexia Lennon, Millie Darvell, Colin
Edmonston, Sarah Biggs and Lauren Shaw.**

September 2011

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EXECUTIVE SUMMARY

Background

Occupant injury comprises the largest proportion of child road crash trauma in most highly motorised countries. In Australia, road crashes are the primary cause of death for children aged 1-14 years and are among the top three causes of serious injury to this age group. For this reason considerable research attention has been focused on understanding the contributing factors and the most effective ways of improving children's safety as car passengers. Australia has been particularly active in this area, with well regarded work being conducted on levels of use of dedicated child restraints, restraint crash performance in laboratory conditions, examination of real world restraint crash performance (case review), and studies of psychosocial factors influencing perceptions about restraints and their use (Brown & Bilston, 2006; Brown, McCaskill, Henderson & Bilston, 2006; Edwards, Anderson & Hutchinson, 2006; Lennon, 2005, 2007).

New legislation for the restraint of children as vehicle passengers was enacted in Queensland in March 2010. This new legislation recognises the importance of dedicated restraint use for children up to at least age 7 years and the protective benefits of rear seating position in the event of a crash.

As part of improving children's safety and addressing key priority areas, the Queensland Injury Prevention Council (QIPC) and Department of Transport and Main Roads (TMR) commissioned the Centre for Accident Research and Road Safety, Queensland (CARRS-Q) to evaluate the impact of the new legislation. Although at the time of commencing the research the legislation had only been in force for 14 months, it was deemed critical to review its effectiveness in guiding parental choices and compliance in order to inform the design and focus of further supporting initiatives and interventions. Specifically, the research sought clear evidence of exactly what impact, if any, the legislation has had on compliance levels and what difficulties (if any) parents/carers experience in relation to interpreting as well as complying with the requirements of the new law. Knowledge about these barriers or difficulties will allow any future changes or improvements to the legislation to address such barriers and thus improve its effectiveness. Moreover, better information about how the legislation has affected parents will provide a basis to plan non-legislative comprehensive multi-strategy interventions such as community, educational or behavioural interventions with parents/carers and other stakeholder groups. In addition, it will allow identification of the most effective aspects of the legislation and those areas in need of extra attention to improve effectiveness/compliance and thus better protect children travelling in cars and improve their health and safety. This report presents the findings from the four components of the research: the literature review; observational study; intercept interviews and focus group with parents; and the interviews with key stakeholders.

Results

The results from each of the separate studies in this research suggest an overall positive impact of the legislative changes on the safety of children in the target age range (0-7 years). In particular, the more objective measure of compliance levels (the observations) revealed greater proportions of children wearing the required restraint type for (estimated)

age and a smaller proportion of children travelling in the front seats of vehicles than was evident in previous available results for Queensland (Lennon, 2005). However, this improvement was at a modest overall level (10%). The benefits of the legislation also appear to be significantly diminished for Mackay, where the proportion of children observed as completely unrestrained was relatively high (7.8%) and of some concern.

Parents in all locations in this research, both Indigenous and non-Indigenous, appear to think the new legislation is a positive move and they perceived the intention of the legislation as being to protect children or improve their safety. Almost all non-Indigenous parents believed they had complied with the new legislation. Indigenous parents in the Woorabinda community believed compliance might be at about 50%. Non-Indigenous parents who responded to the items asking their views of the legislation gave high levels of agreement that the legislation was easy to understand, made it clear what they needed to use with their children and was effective in getting children into the appropriate restraints. However, Indigenous parents identified barriers that could be substantial influences on non-compliance (and therefore effectiveness) in some circumstances and these will need to be addressed if the legislation is to be of maximum effect in all strata of the community.

Stakeholder organisations appeared largely unaffected by changes to the legislation beyond the immediate few months around the time of implementation. For most, the main effect was that parent enquiries increased, substantially for some organisations, and managing these presented short-term operational and logistical burdens. However, stakeholder organisations appear to deal with those parents most likely to be experiencing difficulty with the new legislation and there were accounts of some very negative parent views especially from specialist retailers.

Recommendations

Recommendation 1: That further research be undertaken with rural/remote and regional parents to explore results obtained in this research, with a particular focus on parental beliefs and behaviours in relation to restraint use generally and child restraint use specifically. This research should aim to identify barriers to more consistent and appropriate use of child restraints for parents in these locations. In addition, such research should endeavour to identify effective interventions to address identified barriers.

Recommendation 2: That web-based information available to parents in relation to child restraints remove references to the weight-based criteria for restraint selection that was a feature of the previous Standards as these may be confusing for parents and are inconsistent with the 2010 legislative emphasis on age as the primary criterion.

Recommendation 3: That a coordinated, multidisciplinary approach to the development and distribution of informational and educational materials on the age-appropriate restraints and criteria for transition to larger restraints which specifically target parents of children in the age range 1-4 be adopted. This could seek to involve all the relevant organisations in Queensland that have an interest in safer children's restraint, such as Queensland Health, TMR, RACQ, Queensland Ambulance Service, Kidsafe, Queensland Police Service, Queensland Injury Surveillance Unit and others. One possibility for the distribution of such materials would be as a brief intervention through health practitioners (eg. nurses or GPs) at

the 12 months old triple antigen vaccination (measles, mumps, rubella “MMR”). Posters at health and childcare facilities might also be effective in this regard.

Recommendation 4: That key personnel in Indigenous communities be trained in the correct use and installation of restraints to ensure that this expertise is readily available to the community. It is recommended that the initial candidates for training should be those staff that deal regularly with mothers (clinic staff, child safety workers, daycare staff, etc.). There may even be potential to build restraint use education into health authority programs for new mothers. Potential sources of assistance could include the QAS and Kidsafe. Partnerships between organisations working with communities and QAS or Kidsafe to provide training of personnel could be explored in this respect.

Recommendation 5: That increasing the resources available to schemes such as the child restraint hire scheme in Woorabinda should be considered. This could take the form of providing more restraints for hire, extra personnel to assist with promoting its use, or duplicating the scheme in other locations/communities.

Recommendation 6: That sharing culturally-appropriate educational resources (like the RTA “Bring the Mob Home Safely” restraint promotional material) across jurisdictions should be considered. Permission to modify these for Queensland use could also be explored.

Recommendation 7: That restricting where/how child restraints are sold be explored. A requirement for retailers to either have appropriately trained staff, or minimum standards of guidance available might be sought as part of requirements for retailers of restraints. Alternatively, minimum requirements (e.g. size, type and detail provided, level of prominence of the display) in point of sale display materials that guide parents in selecting a restraint could be specified. Potential cost/affordability issues in relation to this would need to be explored in some depth.

1 INTRODUCTION

1.1 BACKGROUND

Occupant injury comprises the largest proportion of child road crash trauma in most highly motorised countries and for this reason considerable research attention has been focused on understanding the contributing factors and the most effective ways of improving children's safety as car passengers. Australia has been particularly active in this area, with well regarded work being conducted on levels of use of dedicated child restraints, restraint crash performance in laboratory conditions, examination of real world restraint crash performance (case review), and studies of psychosocial factors influencing perceptions about restraints and their use (Brown & Bilston, 2006; Brown, McCaskill, Henderson & Bilston, 2006; Edwards, Anderson & Hutchinson, 2006; Lennon, 2005, 2007).

Recently the Queensland Government, in line with recommendations from researchers and road safety experts and based on the National Transport Commission (NTC)-endorsed changes to the Australian Road Rules, has enacted new legislation for the restraint of children as vehicle passengers. Where previously the type of restraint for children was only specified for infants (under 12 months old), the new legislation now specifies what type of restraint a child must wear up to the age of 7 years. Moreover, the new legislation recognises the importance of rear seating for children by requiring that children be restrained in the rear rather than front seat up to the age of 7 years (Department of Transport and Main Roads (TMR), 2009; NTC, 2008; Office of Queensland Parliamentary Council, 2010)

The new legislation was announced to the public in September 2009, to come into effect from March 10, 2010. However, to date, there has been little evaluation of the effect of the legislation or parent/carer perceptions of it. One observational study (Johns, Lennon, & Haworth, 2010) examined the level of compliance with the new legislation among regional parents/carers (Toowoomba and Rockhampton). Results suggested that there was a positive effect but that this may be limited. Preliminary results from interviews with parents as part of the same study (Johns, Lennon & Haworth, under review) suggest that parents may in fact be confused about what they should do to make their children safer when they travel. The only other evidence of the impact of the legislation to date has been informal and/or anecdotal. Thus it is unclear whether the legislation has achieved the intended outcome of getting children into more appropriate, and thus safer, restraints. Moreover, we have little information about what barriers parents/carers experience to complying with the new requirements.

Although at the time of commencing the research the legislation had only been in force for 14 months, it was deemed critical to review its effectiveness in guiding parental choices and compliance in order to inform the design and focus of further supporting initiatives and interventions. Specifically, the research sought clear evidence of exactly what impact, if any, the legislation has had on compliance levels and what difficulties (if any) parents/carers experience in relation to interpreting as well as complying with the requirements of the new law. Knowledge about these barriers or difficulties will allow any future changes or improvements to the legislation to address such barriers and thus improve its effectiveness. Moreover, better information about how the legislation has affected parents will provide a basis to plan non-legislative comprehensive multi-strategy interventions such as community,

educational or behavioural interventions with parents/carers and other stakeholder groups. In addition, it will allow identification of the most effective aspects of the legislation and those areas in need of extra attention to improve the effectiveness/compliance and thus better protect children travelling in cars and improve their health and safety.

This research was undertaken with the above issues in mind. The research aimed to address the QIPC and National Injury Priorities of 'A Safe Childhood', specifically children's road safety, a critical issue since road crashes are the primary cause of death for children aged 1-14 years in Australia and are among the top three causes of serious injury to this age group.

1.2 PROJECT AIM AND OBJECTIVES

The overall aim of the project was to determine: How effective has the new legislation been in improving appropriate restraint use with children aged 0-7 years (the target age range of the legislation)?

In addition, the research addressed the following questions:

- Do parents/carers understand the purpose of the changes?
- Do parents/carers support the changes?
- What impact has the new legislation had on parents/carers?
- What barriers (if any) are there to better compliance?
- What barriers are there to universal support for the changes?
- What can be done to address the barriers and thus improve the effectiveness of current and future safety of children's passenger travel?
- What impact (if any) has the new legislation had on stakeholder groups?

To investigate these questions, the following objectives were set for the sub-studies of the project:-

Objectives

- (1) To estimate the current level of compliance with the new legislation for restraint of children in vehicles by direct observation of child passenger restraint use (type) and seating positions (front, rear) in cars and passenger vehicles in a cross section of major Queensland population centres, particularly focusing on children estimated to be aged 0- 7 years;
- (2) To identify any variables that are predictive of compliance.
- (3) To estimate the level of parent/carer understanding of the purpose of the new legislation.
- (4) To estimate parent/carer knowledge about the new legislation.
- (5) To estimate the level of support for the new legislation among parents of children in the age groups most affected by it (0-7 years).

- (6) To identify barriers to greater effectiveness of the legislation on parental/carers' perceptions and provide some options for overcoming those barriers.
- (7) To identify barriers to greater effectiveness of the legislation on parental/carers' behaviour and provide some options for overcoming those barriers.
- (8) To assess the level of support for the legislation among stakeholder groups and the community generally.
- (9) To assess the impact of the legislation on other stakeholder groups.

1.3 STRUCTURE OF THE REPORT

The report begins with a review of the literature in the area of child occupant protection, with a particular emphasis on Australian research for the Australian context (Section 2). Section 3 describes the observational study and reports the estimations of the extent to which children are restrained in the types of restraints and seating positions specified under the legislation. Sections 4 and 5 then describe the studies conducted with parents (non-Indigenous and Indigenous, respectively) to gauge their understanding of the legislation and their perceptions about barriers to compliance or effectiveness. The stakeholder interview study is described in Section 6. Finally, Section 7 summarises the results of the whole study and brings together the recommendations that derive from it.

2 SECURING OUR CHILDREN: A REVIEW OF THE LITERATURE ON CHILD PASSENGER RESTRAINT

Motor vehicle crashes remain a leading cause of serious injury and death for children in Australia (Australian Bureau of Statistics, 2006), claiming the lives of 105 and 77 children under the age of 16 in 2009 and 2010, respectively (Road Deaths, 2010). Although it is well established that child restraint systems offer child passengers an effective level of crash protection, from a road safety perspective, safe and proper use of child restraints continues to be problematic. In particular, significant improvements have been made in Australia and elsewhere as a result of dramatic increases in child restraint use (Brown et al., 2011), an overall decline in crash-related child mortality and morbidity (Henderson et al., 2003; NHTSA, 2009) and recently in Australia, new legislation that aligns more closely with best practice child restraint recommendations (Australian Road Rules, 2009). However, rates of restraint misuse, inappropriate use and poor seating position choices for child passengers have remained at an undesirable level for some time, which, among other issues, have continued to place children at increased risk of injury and fatality.

Recent changes to the laws on children's restraints were introduced with the intention of better informing and guiding parental choices in relation to ensuring their children's safety. With the introduction of these new legislative measures, it seems both timely and important to examine whether, and how, the laws influence parental practice and the subsequent safety of child passengers. This paper discusses the issues outstanding in child occupant safety and the potential strategies through which protection may be enhanced, with particular attention to the current research, understandings and evidence of restraint practices within an Australian context.

2.1 CHILD RESTRAINT LEGISLATION IN AUSTRALIA

Prior to the 1970s, there were no laws requiring Australian children aged 8 years and under to use seatbelts or any other form of restraint whilst travelling. Australia first introduced the compulsory restraint wearing for children under the age of 8 in 1976 in Victoria, and by 1982 this legislation had become uniform across all Australian States and Territories (NRMA, 1988).

Until very recently, few changes had been made to this legislation. The former Australian Road Rules specified that infants under 12 months of age be restrained in an approved child restraint, and that children aged between 12 months and 16 years be restrained in either an approved child restraint or an adult seatbelt (Australian Road Rules, 2000). Also, children were not prohibited from riding in the front seat of a vehicle although, if they did, they were required to be properly restrained. Legally, this meant that children of all ages were permitted to travel in any vehicle seat fitted with a restraint, and children as young as 12 months could use adult seatbelts instead of a child-specific restraint. This also placed the responsibility for determining the appropriateness and positioning of child restraints largely on parents and carers (Charlton et al., 2005).

The absence of more definitive guidelines for child passengers, and growing concern among researchers and road safety advocates that children were not as well-protected as they

could be resulted in recommendations to the National Transport Commission for changes to the Australian Road Rules. As a result of acceptance of these recommendations, child restraint laws have now been upgraded throughout Australia allowing them to be more in line with best-practice child restraint recommendations.

New legislation was announced and enacted in most Australian States by mid-2010 following a transitional period. These new laws state that children up to the age of 7 must be secured in an age-appropriate child restraint, and seated in the rear seat (Australian Road Rules, 2009). The new laws mandate rearward-facing restraints for infants less than 6 months of age (as previously). If the child is at least 6 months old, but less than 4 years old, he/she must be secured in either a rearward-facing or forward-facing restraint with an in-built 6-point harness. Children aged between 4 and 7 years are required to use forward-facing restraints or booster seats. After turning 7, children may continue to use an approved child restraint or they must wear a properly adjusted and fastened seatbelt. No child under the age of 7 is permitted to sit in the front seat of a vehicle that has at least two rows of seats, unless the child is at least 4 years old and all the rear seats are occupied by other passengers aged under 7 (please see **Table 1** for further details of the legislation requirements). These new laws are a major step forward for child safety in Australia and offer the potential to not only save lives but provide parents with more straightforward advice and clarification in terms of how to better protect their children.

Table 1. Part 16: Rules for persons travelling in or on vehicles - Rule No. 266: Wearing of seatbelts by passengers under 16 years old (Australian Road Rules, 2009)

Age	Rule
< 6 months	He/she must be restrained in a suitable and properly fastened and adjusted rearward facing approved child restraint
6 months – < 4 years	He/she must be restrained in a suitable and properly fastened and adjusted: rearward facing approved child restraint; or forward-facing approved child restraint that has an inbuilt harness
4 years – < 7 years	He/she must be: restrained in a suitable and properly fastened and adjusted forward-facing approved child restraint that has an inbuilt harness; or be placed on a properly positioned approved booster seat and be restrained by a seatbelt that is properly adjusted and fastened
< 4 years	He/she must not be in the front row of a motor vehicle that has 2 or more rows of seats
4 years – < 7 years	He/she must not be in the front row of a motor vehicle that has 2 or more rows of seats unless all of the other seats in the row or rows behind the front row are occupied by passengers who are also under 7 years old
7 years – < 16 years	He/she must be restrained in a suitable approved child restraint that is properly adjusted and fastened; or He/she: must occupy a seating position that is fitted with a suitable seatbelt; and must not occupy the same seating position as another passenger (whether or not the other passenger is exempt from wearing a seatbelt under rule 267); and must wear the seatbelt properly adjusted and fastened .

2.1.1 How Child Restraints Work

The invention of child restraint devices has been hailed as one of the most noteworthy public health developments of the 20th century (Ebel, 2010). Since their introduction, it has been widely and consistently documented that child restraints, in general, reduce the risk of injury and fatality in traffic collisions (e.g. Brown et al., 2006; Durbin, 2001; Henderson, 1994; Mackay, 2001; NHTSA, 2009; Rice & Anderson, 2009; Weber, 2000). Recently in the US, where very large crash databases allow relatively fine-grained analyses of crashes, it was estimated that child restraints saved the lives of 309 children under the age of 5 in 2009, and that an additional 63 would have been saved if restraints had been used by all children in this age group (NHTSA, 2009).

Child restraints work by distributing the forces during a crash over the child's strongest body components, by reducing the extent to which the child's body makes contact with the vehicle interior (AS/NZS 1974:2010) and by reducing the amount of crash force that is transferred to the passenger. An important principle of protection involves maximising the child's 'ride down' during a crash. To achieve this, the child must be fastened as tightly as possible to the vehicle via the restraint to maximise the distance over which the wearer comes to a stop (Bilston, Brown, & Kelly, 2005). Thus, overall, the protective effect of a child restraint is crucially dependent upon its correct installation in the vehicle as well as proper harnessing of the child into the restraint. In addition, retention of the child in the restraint is enhanced by using the most appropriate sized restraint for the child (Charlton et al., 2005).

The protective efficacy of child restraints varies depending on the type of restraint system being used. Restrained children involved in crashes typically receive injuries that are only minor in nature (Agran et al., 1997; Brown, Griffiths, & Paine, 2002; Brown et al., 2005). However, the most common injuries occur to the head (Newgard & Jolly, 1998), usually as a result of contact with the vehicle interior (Henderson, 1994), and it is these that are likely to result in serious injury or death. Thus, the primary goal of a child restraint is to minimise head and body excursion to prevent contact with the inner vehicle structures and, to do so effectively, the restraint design must be suited to the biomechanical and anthropometric characteristics of the child (Henderson et al., 2003).

2.1.2 Types of Child Restraint on the Australian market

In Australia, the design and performance requirements of all child restraints are regulated by, and must be approved to, the Australian Standard (AS/NZS1754:2010 - Child Restraint Systems for Use in Motor Vehicles). Very recently, the Standard has undergone a number of revisions (2010), perhaps the most significant of these being the changes to the way in which child restraints are categorised. Child restraints are now categorised in terms of approximate age ranges, rather than the child's weight and height. Although in the past restraint designations were based substantially on mass, the child's age is now considered the primary factor in determining the most suitable restraint system (TMR, 2011; Edwards, Anderson, & Hutchinson, 2006). In addition, booster cushions (also known as backless booster seats) have been removed from the AS/NZS1754:2010 as they are unable to offer side impact protection. Currently, amendments to include a taller booster seat (Type F), colour-coded marking of the seatbelt path on restraints, and modifications of booster seats to reduce the risk of abdominal injury are under consideration (AS/NZS 1754:2010).

There are a number of different child restraints available in Australia, each designed to suit the age and developmental stage of the child. Child restraints can be broadly grouped into rearward-facing restraints for infants, forward-facing restraints for toddlers, and booster seats for older children. Specifically, for younger children the most suitable restraints are: rearward-facing restraints (or infant carriers) for infants up to 12 months (birth to 9 or 12kgs); convertible restraints used in rearward-facing mode for children aged between 6 and 12 months (up to 12kgs); and either convertible restraints used in forward-facing mode or standard forward-facing restraints for children roughly 6 months to 4 years of age (8-18kgs) (AS/NZS1974:2010; RTA, 2011). Each of these restraints comes with an inbuilt six-point harness system. The restraint itself is held in place by the vehicle's lap/sash belt, which is passed through the restraint frame. In addition, top tether straps, which are attached to an anchor point, are required in Australia (Griffiths, Brown, & Kelly, 2009). **Figure 1** (below) illustrates each of these restraint types.



Figure 1. Child restraints (suitable from birth to approximately 4 years of age)

For older children between the ages 4 and 7 years (typically between 14-26kgs), belt-positioning booster seats are the most suitable restraint. Booster seats were developed for taller, heavier, and older children in order to lift the child to a position where the adult seatbelt would fit adequately and offer crash protection similar to that afforded to an adult (Kahane, 2004). Ultimately, booster seats aim to make an adult belt fit a child's smaller body proportions by altering the position of the lap part of the adult seatbelt so that greater downward force is applied on the child's thighs. In addition, the booster seat positions the sash part of the belt so that it crosses the child's shoulder (a relatively strong part of the body) as opposed to crossing the face or neck, which are more vulnerable (Griffiths et al., 2009). Booster seats can also be used with an 'H' harness (4-point harness) which allows the use of the booster seat in vehicle positions with lap-only belts (e.g. centre rear seats). It is generally accepted and recommended that booster seats not be secured by lap-only belts due to the increased potential for head contact with the vehicle interior. This is because booster seats position the child closer to the roof of the vehicle, and when coupled with use of a lap belt increase the chances of a head strike given that the lap belt does not contain upper body movement.

Until recently, booster seats were available with either a high back or as a backless ‘cushion’ (see **Figure 2**) and were designed to suit children between the weights of 14 and 26kgs. More recently, with the acknowledgement that some children aged 4 to 7 years fall beyond this weight range, new designs and categories of booster seats have become available, particularly larger booster seats and convertible booster seats which combine the features of forward-facing restraints and booster seats. **Figure 2** displays examples of safety seats suitable for older children. Booster cushions, although incorporated into the rear seat of some vehicles (and thus not defined as separate child restraints), do not offer any means for retaining the child’s head in side impact crashes or when sleeping. Although backless booster seats are still sold in Australia, they have been excluded from dynamic performance testing since the beginning of such programs (Brown et al., 2007). It is expected that booster cushions will disappear from Australian retailers throughout the year 2011 (Lumley, 2011).



Figure 2. Childseats (suitable for those up to approximately 7 years of age)

2.1.3 Protection offered by infant and toddler restraints

For infants, rearward-facing restraints are designed to prevent the child’s relatively large head from loading their proportionally smaller and weaker neck, and this support is largely provided by the structure of the seat (Weber, 2000). Research in the US based on crash-specific databases has revealed that these restraints, when used among infants 0-23 months and small children, may reduce the risk of fatality by 71% (NHTSA, 2009) and injury by as much as 93% (Henary et al., 2007). For slightly older children, forward-facing restraints hold the child’s torso in place but the head is free to move, thus, these restraints must be designed to limit head excursion so as to prevent head contact with the vehicle interior (Henderson et al., 2003). Performance in the US context, where restraints are not required to have top tethers, suggests that forward-facing restraints reduce the risk of death by 54% (Stames, 2005) to as much as 78% (Arbogast et al., 2004). The relative paucity of Australian fatality figures for children in this type of restraint, together with the requirement for using top tethers means that comparable calculations are unavailable. However, in terms of preventing injury, Australian dynamic testing has indicated that forward-facing restraints with top tethers are extremely effective at limiting forward head excursion under various restraint configurations (Lumley, 1997), as well as withstanding severe crash forces that might otherwise result in serious injury to the child’s neck or chest (Henderson, 1994). This

has led experts in the area to conclude that forward-facing restraints, when used in the Australian context, are very effective at providing protection against injury.

In-depth Australian studies examining restraint performance under real-world conditions have also detailed the benefits of child restraints. The first, examining 131 crashes in which children aged 14 years and younger were injured, revealed that children wearing a restraint of some form received only minor injuries or no injuries at all (Henderson, 1993). Of those using forward-facing restraints, only one child was killed and four seriously injured, however, these outcomes were considered to be a result of gross misuse (discussed further below) or intrusion to the occupant space. The study also found, that despite high levels of restraint use (92%), 87% of children were suboptimally restrained (discussed below). More recently, a case review of children aged under 8 years presenting to hospitals subsequent to crashes revealed remarkably similar rates of restraint use (93%) and proportions of suboptimally restrained children (87%), as well as comparable rates of fatalities (5%) and serious injuries (20%) (Brown et al., 2005). This study provided evidence for the benefits of optimal restraint: even in those crashes judged to be severe, no deaths or serious injuries were reported among the children who were optimally restrained (Brown et al., 2005).

Side impact protection

Side impact collisions are believed to contribute to around 30% of crashes in Australia (Brown et al., 2005) and may present over three times the risk of serious head injury compared to frontal impacts (CIREN, 2002). Thus, in side impact crashes, the protection offered by child restraints is critically dependent on how the restraint has been fitted to the vehicle. This is because in lateral impact, head injuries commonly occur as a result of either contact with the restraint or with the vehicle interior (Brown et al., 2002), and this movement is thought to be highly influenced by bottom anchorage of the restraint (Bilston, Brown, & Kelly, 2005). Australian dynamic testing has revealed that fully-rigid anchorage systems, where the base of the restraint is fitted tightly to the car seat, significantly outperform flexible or semi-rigid anchorage systems in terms of preventing head contact (Bilston et al., 2005; Charlton et al., 2004). Alternative anchorage systems such as ISOfix (rigid) and LATCH (flexible), however, cannot be used illegally in Australia at the moment as they do not comply with the top tether arrangements specified by the current Standard AS/NZS 1754:2010. Although providing for ISOfix restraints has been considered previously it has not yet been incorporated into the Standard, though it is being considered again and may be included in the next review, potentially leading to such systems being introduced to Australia in the next few years.

In a lateral impact, the design of the restraint largely determines the protection offered. In this kind of crash, the primary goal of a child restraint is to retain the child's head within the restraint and provide energy absorption in the side wings of the restraint (Griffiths et al., 2009). However, until recently, no Australian restraints offered this feature. Even now, not all restraints sold in Australia provide energy absorption in these side structures. In addition, there have been concerns regarding the adequacy of the side wings in retaining children's heads. In many forward-facing restraints, the side wings are not sufficiently high or long enough to protect those children whose dimensions are at the upper limits of the mass or height range for which the restraints were intended (Bilston et al., 2005). Dynamic testing of restraints has also revealed that some rearward and forward-facing restraints significantly

outperform others in terms of limiting head exposure above the top edge of the side wings (Suratno et al., 2007). Although the addition of energy-absorbing padding in the side wings has been found to significantly reduce test-dummy head injury scores (Bilston et al., 2005), this effect was found only when the head was retained within the restraint.

Given the need to improve the head retention capacity of restraints, and in line with ongoing recommendations for enhancing these side structures (Brown et al., 2002; Griffiths et al., 2009), the Standard now has a new set of side impact testing requirements including the use of larger and smaller test dummies, and provision of at least a 10mm clearance between the head and the test door as well as compulsory energy absorption in the side wings of the seat. As a result of these new requirements, meeting AS/NZS 1754:2010 will require the side wings of child restraints to be somewhat larger (Lumley, 2011), which should therefore aid in improving side impact protection.

2.1.4 Protection of older children

Although booster seats are capable of improving the safety of primary school-aged children, their protection is not as effective, and the evidence for their efficacy not as conclusive, as that of restraints designed for younger children. Moreover, the interpretation of booster seat effectiveness is complicated by the considerable variation in the design of the different types of booster seats (Griffiths et al., 2009), and perhaps more importantly, the lower levels of their use among children aged 4-8 years, who may be more likely to use adult seatbelts instead (Durbin, 2001; Durbin, Elliott & Winston, 2003; Rice, Anderson, & Lee, 2009; Winston et al., 2000). In addition, estimates of booster seat efficacy appear to vary markedly depending on the type of data used to derive them. Given that research examining booster seat performance in an Australian context is relatively limited, particularly in regards to real-world conditions, much of what is known about booster seat efficacy is based on American data.

One study using analyses of US insurance claim records demonstrated a very high reduction (70%) in injury risk for children using high back booster seats (but not backless booster seats) compared to adult seatbelts (Arbogast, Kallan, & Durbin, 2005). Other research has suggested lower levels of benefit. For instance, another study also based on insurance claim records estimated that 4 - 7 year old booster seat users had a reduction in risk of injury only as high as 59% (Durbin et al., 2003). More recent analyses of similar insurance data for crash-involved children and accounting for age of vehicle and direction of crash have found that booster seat users aged 4-8 years were around 45% less likely to suffer serious injuries (AIS \geq 2) than their counterparts using seatbelts (Arbogast, Jermakian, Kallan, & Durbin, 2009). Moreover, this study contained a larger proportion of older children (6-8 years) than earlier studies due to the increase in use of booster seats in many US states in more recent years. Australian in-depth analysis of real-world data, although based on a small sample, has also shown that children in booster seats were significantly less likely to suffer serious injuries than children using adult seatbelts (Brown et al., 2005). However, other analyses using other data bases (e.g. National Automotive Sampling System, Crashworthiness Data System) have shown effects that were more dependent upon the type of data used and the severity of injury, with no reduction found in some instances (Sivinski, 2010).

Although booster seats appear effective in lowering the odds of injury among children using them, in terms of preventing death they may be no more effective than adult seatbelts. Booster seats were designed to prevent seatbelt-related injury or “seatbelt syndrome”, characterised by injuries to the abdomen and spine (Arbogast et al., 2007). For this reason, they are particularly effective at lowering the risk of injury to the abdomen that occurs as a result of the seatbelt riding up over the child’s pelvis (Durbin et al., 2003). In addition, booster seats have been found to provide superior protection to that of a lap-sash seatbelt in terms of head acceleration and neck injury (Charlton et al., 2005). However, a recent US study has revealed that booster seats used with lap-sash seatbelts did not improve on the performance of seatbelts alone in preventing death among children aged 4-8 years (Rice, Anderson, & Lee, 2009). The authors concluded that while booster seats may reduce non-fatal injury severity, death may be effectively prevented by seatbelts alone. Only one study prior to this had examined the link between booster seats (among other restraint types) and fatal outcomes among children aged 2-6 years (Elliot et al., 2006). While it was reported that restraints overall were associated with a 28% reduction in risk of death, 75% of the children were aged 2 or 3 years and separate analyses for older children likely to be using booster seats were not conducted.

Although the research cited above provides valuable information about the level of protection offered by booster seats, the data used is based primarily on police reported crashes which typically represent more severe crashes involving major property damage and fatal injury (whereas crashes involving minor damage and nonfatal injury are underreported; NTHSA, 2009). Thus, to understand booster seat performance better and overcome some of the inconsistencies associated with analysis of real-world data alone, it is critical to also consider the pattern of results revealed in laboratory testing. One issue that has been revealed in dynamic testing is the level of protection that booster seats provide in side-impact crashes. Australian sled tests of right-angle side impacts using a 6 year old dummy have revealed that high-back booster seats were no more effective than adult seatbelts at preventing head contact with the side door window (Huot, Brown, Kelly, & Bilston, 2005). More recent testing of sixteen booster seats revealed that only one was capable of preventing the head from striking on the door structure in side impact collisions (Suratno et al., 2007). Although other lateral impact crash tests using 3 and 6 year old dummies have reported no observed head contact with the vehicle interior (Charlton et al., 2005), it was found that the booster seat with a higher back and larger side wings, designed for larger children (15-26kg), failed to contain the head during the rebound phase at a relatively low crash speed, indicating a risk for occupant-to-occupant collision. Thus, as is the case with some restraints designed for younger children, significant improvement is needed in the design of lateral support (e.g. wings) in booster seats to provide adequate side impact protection to children in the slightly older age bracket.

2.2 BEHAVIOURAL FACTORS: SUBOPTIMAL USE

Despite the proven effectiveness of child restraints, in many cases they do not reach their maximum level of efficacy due to issues involving their selection and use. In the literature, suboptimal restraint refers to two types of conditions: restraint misuse, which relates to incorrect fitting of the restraint to the vehicle and of the child to the restraint; and inappropriate use, when the designated restraint is not the one most suitable for the child’s size. Broadly speaking, research into the effects of misused or inappropriately used child

restraints has indicated that suboptimally restrained children are less likely to be protected in the event of a crash, and are injured more often and more seriously than children who are optimally restrained (Brown et al., 2006; Gotschall et al., 1997; Henderson, 1993; Henderson et al., 1994). Research in the US has also revealed that suboptimal restraint use is more evident among families with low income and low parental education, and among families of non-Hispanic black backgrounds (Winston et al., 2006).

2.2.1 Restraint Misuse

Of the two forms of suboptimal restraint use, misuse is considered the most critical and has been strongly associated with serious injuries and fatalities (Arbogast et al., 2004; Brown et al., 2005; Gotschall et al., 1997; Henderson, 1994). Restraint misuse can take various forms, ranging from the relatively mild, such as having slack in the harness or seatbelt, to the more severe and potentially life threatening such as failing to secure the restraint to the vehicle (Henderson, 1994). Reconstructions of real-world crashes have demonstrated that misuse results in greater motion of the child's torso and head, which increases the chances of contact between the child and the rigid structures of the vehicle interior, and thus, elevates the risk of injury (Bilston, Yuen, & Brown, 2007).

In terms of the factors associated with restraint misuse, to date there has been little Australian research. However, misuse has been found to be more common among non-English speaking families, younger children, and in situations where there are fewer children in the vehicle (Bilston, Du, & Brown, 2011). It also appears that these factors are not the same as those predicting inappropriate use (discussed later).

Installation

Failure to correctly install restraints can reduce or abolish their safety benefits (Henderson, 1994). Indeed, although restraint use has increased dramatically in Australia in the past thirty years, with compliance estimates rising from around 60% in 1980 (Herbert & Freedman, 1980), to 95% in 1994 (Henderson et al., 1994), and recently, reaching very high rates of above 99% (Brown et al., 2010), a mounting body of Australian and international research has indicated that such figures may belie widespread installation errors. In the US, one study reported that nearly 90% of restraints had at least one fitting fault (Eby & Kostyniuk, 1999), while a further multi-state study revealed that only around 20% of restraints for 0-4 year olds were used correctly (Decina & Knoebel, 1997). Similar misuse practice rates were found in a New Zealand pilot study indicating that roughly 60% of parents made at least one error fitting the restraint to the vehicle, while 65% made at least one error fitting the child to the restraint (Wren, Simpson, Chalmers & Stephenson, 2001).

In Australia, site inspections carried out by the Royal Automotive Club of Victoria (RACV) revealed that of 4,600 child restraints inspected, 69% were deemed to have installation faults, and that 25% of these had installation faults that were regarded as major (Glanvill, 2000). Not long after this study, a car park survey revealed that 39% of observed restraints were incorrectly installed, with a failure to use the top tethers in capsules accounting for one third of the faults and a similar proportion of faults resulting from incorrect adult belt-threading in forward-facing restraints (Paine & Vertsonis, 2001). Very recently, inspections of 1,996 vehicles across multiple Australian states indicated that the majority of restraints

(79%) had at least one instance of misuse (Koppel & Charlton, 2009), the most common fitting faults being harness strap errors (38%) (e.g. twisted or incorrectly positioned straps), seatbelt errors (23%) and missing or incorrectly fitted buckle-locking clips (23%). In addition, it was found that the highest rates of misuse occurred in forward-facing restraints (88%) compared to infant seats (67%) and booster seats or cushions (63%). Similarly, a recent observational study revealed that misuse was higher among younger children than older children using booster seats or seatbelts, although data on child-specific restraint types was not distinguished among younger children (Bilston et al., 2011).

Taken as a whole, these findings suggest that younger children in Australia, at least those using forward-facing restraints, may be particularly prone to having their restraints poorly fitted. This may be due to several reasons. One reason might be that parents may feel a strong need to properly secure their infants but become less vigilant or more complacent as the child ages (Decina & Knoebel, 1997). Alternatively, it may be that parents seek assistance with fitting a restraint that involves more complicated anchoring (e.g. an infant capsule, or a convertible capsule/forward-facing restraint in rear facing mode) and do not do so for second and subsequent restraints. As restraints suitable for younger children are generally more complicated to install or fit in a vehicle compared to those for older children (e.g. booster seats or adult seatbelts) (Koppel & Charlton, 2009), it may be that these second restraints are more prone to installation or fitting errors.

A third possibility is that parents generally underestimate the difficulty of installing restraints and overestimate their own ability to do so correctly. Although installation of child restraints suitable for younger children is generally understood by professional fitters and researchers to be somewhat complicated (Charlton et al., 2005), there appears to be a widely-held perception among parents and carers that it is a relatively easy task (Glanvill, 2000; RACQ, 1999). A recent survey indicated that two thirds of parents and carers surveyed reported installing the restraint themselves. Moreover, other studies have found that the majority of such parents rate themselves as very confident in their ability to do so correctly (Govan, Lennon, Hood, & Haworth, 2010; Johns, Lennon, & Haworth, unpublished data). These findings are very similar to those reported roughly ten years ago (Glanvill, 2000; RACQ, 1999). Thus, it is not surprising that in both the past, and currently, only a small percentage of parents have been found to seek advice and services from approved restraint fitters or specialists (Glanvill, 2000; Stewart & Lennon, 2007), a finding consistent with contentions that parents are inclined to suffer from optimism bias and be unaware of their own need for assistance in relation to child restraints (Will & Geller, 2004). Very recently, in a study evaluating the effectiveness of Restraint Fitting Stations in NSW (Brown et al., 2010), children of respondents who did not use these stations were almost twice as likely to be incorrectly using their restraints as children of parents who used Fitting Stations. Moreover, it was found that regardless of whether a Restraint Fitting Station was used, as the length of restraint ownership increased, so did the likelihood of incorrect use. Based on the findings from these studies, it appears that currently as much as two thirds of Australian children may be being carried in vehicles with their safety seriously compromised due to poor fitting/installation of their designated child restraints.

Research into parental attitudes and knowledge regarding child restraints has suggested that there are a number of other factors that may contribute to high rates of installation errors. These include the costs (perceived or real) associated with the use of professional

restraint fitters, limited knowledge about, or access to, approved fitters, and past 'successful' experiences of fitting restraints, but above all, a lack of understanding about the complexity of correctly fitting restraints and the consequences of incorrect installation (Bilston et al., 2011; Glanvill, 2000; Koppel & Charlton, 2009). In order to discourage incorrect fitting of restraints and therefore reduce the chances of parents predisposing their children to a bad outcome in the event of a crash, considerable effort may be needed to address these factors, particularly those related to misunderstandings in relation to the ease of correct fitment/installation. While it is likely that an important component of this is educating parents about the dangers of poor installation, it is also important that interventions be designed to achieve this without disempowering parents or creating levels of alarm that are likely to be counterproductive.

Contribution of restraint design to misuse

Vehicle and child restraint design has also been found to contribute to the use, or misuse, of restraints. Despite many advancements made over the past two decades in terms of restraint design innovations to reduce the propensity for misuse (thanks to programs such as the Australian Child Restraint Evaluation Program, which involves dynamic testing and assessment of the ease of use of restraints), there is still room for further improvement. Some design-related issues involve fitment of the restraint within the vehicle, such as seatbelt geometry (the angle of sash belts and location of anchorage points), the compatibility between the rear seat and restraint geometry, and the difficulty of anchoring the top-tether to the vehicle. Other issues concern fitting the child into the restraint, and these problems are particularly evident for booster seat use. One issue raised by Charlton et al. (2005) is that, for booster seats used with H-harnesses, the crotch strap/anti-submarining device may be too easily undone by a child or not properly engaged with the lap part of the seatbelt when fitting the child into the restraint (Charlton et al., 2005). This raises serious concerns given the critical role of this device in preventing the child from sliding under the lap portion of the seatbelt (Griffiths et al., 2009), which can result in major injury to the neck, blood vessels and spinal cord (Charlton et al., 2005). Further research has indicated that some booster seats are not tall or wide enough to accommodate children between 6 and 8 years (Bilston & Sagar, 2007), while other studies have demonstrated that many booster seats do not achieve their purpose of improving the seatbelt fit for children using them (Brown, Kelly, et al., 2009; Reed et al., 2008).

In light of the above findings, a new booster seat designed to accommodate children up to 138cm in height is currently being introduced into the Standards. The new booster seat (Type F) will assist in protecting children too large for standard booster seats but too small for adult seatbelts, and will accommodate children in this 'gap' (8 to 10 years of age). Also, AS/NZS 1754:2010 now includes new test requirements to ensure correct fitting of the lap-sash belt when using booster seats, including requirements that the lap belt sits on the child's thighs and hips, that the sash belt is in contact with the child's chest, and that the child's lower legs are at least on a 45 degree angle when sitting on the seat (Lumley, 2011). Several other important changes to the Standard should also assist in reducing the likelihood of inadvertent restraint misuse. These include warnings and other guidance information displayed on the restraint, such as colour coded seatbelt paths (blue for rearward-facing, yellow for forward-facing, red for booster seats), labeling to advise correct use and discourage incorrect use (e.g. "A sash belt behind the back or under the arm is dangerous")

and more detailed information booklets designed to aid consumers in the selection and use of the correct type of restraint (AS/NZS1754:2010).

2.2.2 Inappropriate restraint use

As children grow, it is essential that they use a restraint system appropriate for their size, particularly their seated height and weight (Winston et al., 2000). Given the unquestionable benefits of using restraints designed specifically to suit the children's dimensions, most road safety advocates recommend that children keep using a particular restraint until they reach the maximum size for it. However, a considerable body of research has indicated that children are often moved into larger restraints, or shifted directly to adult seatbelts alone, too soon for good fit (Durbin et al., 2005; Ebel et al., 2003; Eby et al., 2005; Ramsey et al., 2000; Eby & Kostyniuk, 1999; Brown et al., 2006; Nance et al., 2004; Winston, Durbin, Kallan & Moll, 2000). This is considered inappropriate restraint use and is a major issue both in terms of its frequency and consequences (Brown et al., 2005; Brown et al., 2006; Bilston et al., 2011). This untimely transition is also referred to as premature "graduation" of a child to the next level of restraint type (Winston et al., 2000). Although the consequences of premature graduation do not appear to be as severe as those for incorrect use, they are of concern because of the relatively large proportion of children affected.

Dangers of premature graduation

Children who use a restraint that is too large for them, and thus inappropriate for their size, are placed at a significantly elevated risk of injury compared to their more appropriately restrained counterparts. For instance, US research has found that among young children aged 3-4 years who use booster seats rather than child-specific restraints, the risk of both non-disabling and fatal injuries increases by as much as 27% (Sivinski, 2010). For slightly older children, Australian and US-based research suggests that premature graduation to adult seatbelts is even more prevalent and problematic in terms of injury outcome (e.g. Koppel et al., 2008; Winston et al., 2006). A recent study has indicated that 56% of Australian children aged 4-11 are moved prematurely into adult seatbelts (Koppel et al., 2008), and these children, compared to those placed in booster seats, may be 3.5 times more likely to be injured and are at 4.2 times the risk of experiencing head trauma (Durbin et al., 2005; Winston et al., 2000). This is because when children use adult seatbelts before reaching a suitable height, the lap belt tends to cross the abdomen and the shoulder belt often contacts the lower face and neck, which can contribute to severe soft tissue, neck and face injuries (Bingham et al., 2006) as well as injuries to the spine (Winston et al., 2000). To counter this, parents or children may move the sash portion of the belt behind the child's back or under the arm thus significantly altering the dynamics of the belt and in some instances severely compromising the protection offered by the restraint (see Brown et al., 2005).

Australian studies of child crash injury have similarly provided evidence for the benefits of appropriate restraint. In the case-review study cited earlier (Brown et al., 2005), children who were optimally restrained (i.e., in an age-appropriate restraint and seated in the rear of the vehicle) sustained only minor injury even in those crashes judged to be severe. All the

injured children in this study were found to be suboptimally restrained, usually in that they were wearing restraints too big for them, and this effect was particularly obvious among children aged 2 to 4 years (Brown et al., 2006). However, these suboptimally restrained and thus injured children were all complying with legislation of that time, which, as mentioned previously, did not specify the particular type of restraint that children older than 12 months should wear.

Positive effect of legislation on appropriate use

While parents may report that they use child restraints because they believe them to be effective in reducing injury, legislation also appears to be important. A State-wide survey of parents in Michigan in the US revealed that beliefs that booster seats were required by law was a primary determinant of the motivation to use, and usage rates, of booster seats, even though the legislation did not actually mandate booster seat use in that state at the time (Bingham et al., 2006).

Acting on research findings such as those in the previous sections, the NHTSA in the US prioritised the issue of booster seat use among booster seat-appropriate children in 2008 (Decina, Lococo, Ashburn, Hall, & Rose, 2008). Recent figures have suggested that this strategy may have been very effective in persuading legislators to act as well as altering parental behaviour: rates of appropriate restraint use among children aged 4-8 years has increased threefold in the past decade, which can be attributed, in part, to many states upgrading their child restraints laws to make booster seats compulsory for children older than 4 years of age (PCPS, 2009). These changes appear to be having the desired effect on safety outcomes, with more recent crash data analysis indicating an 18% reduction in crash-related injury among children aged 4-6 years following the mandating of booster seat use for age-appropriate children (Sun, Bauer, & Hardman, 2010).

In Australia, since the requirements for children to use dedicated restraints was introduced, the proportion of children in age-appropriate restraints appears to have increased in NSW (Bilston et al., 2011), currently the only state for which we have data, although there has not been a corresponding dramatic improvement in the rates of correct use. However, previous research with NSW parents has suggested that, somewhat paradoxically, rates of incorrect restraint use are higher among parents with children in age-appropriate restraints compared to those with children using one inappropriate for the child's size (Brown, Hatfield, et al., 2009). These findings have important implications for the new legislation, as they may indicate that incorrect use of restraints might counter some of the benefits of using age-appropriate restraints. As Bilston and colleagues discuss (2011), legislation focusing on age-appropriate restraint use may thus unintentionally increase the rates of incorrect restraint use, unless countermeasures to prevent incorrect use are also introduced.

Another important issue to consider in promoting appropriate restraint use is that parents are more likely to choose an appropriate restraint when they possess knowledge specific to the age of their child. A recent NSW survey revealed that knowledge of age-specific restraint practices is a key determinant of appropriate restraint use among children under the age of 10 (e.g. "knowing that children should be at least 8 years old to use adult seatbelts") whilst knowledge not relevant to the child's age was not associated with more appropriate restraint use (Bilston, Finch, Hatfield, & Brown, 2008). This suggests that efforts aimed at improving

appropriate restraint use do not necessarily need to focus on increasing parental knowledge overall, but rather should target information to the child's age and transition points, which could be expected with the Standard's new age-based restraint designations and shoulder height markers in conjunction with the new legislation. Other factors may also have to be considered in relation to targeting such interventions, as in Australia, inappropriate restraint use has been found to be associated with larger family size, lower parental education, parent travelling unrestrained, and parental willingness to negotiate restraint use with the child (Bilston et al., 2008).

A final issue deserving of attention with respect to the new legislation is the possibility that premature graduation from booster seats to adult seatbelts may actually increase rather than decrease. That is, parents may interpret the legislation as implying that an adult belt is the preferred or most appropriate restraint for children 7 years and over, rather than using this age as a guide to deciding when a child should move to the adult belt. As a result, where previously some parents might have kept their shorter or lighter 7 or 8 year old in a booster seat until the child reached an appropriate height, these parents may now move that child into an adult belt once a child reaches their 7th birthday. The US system recognises that children should be adult height, nearer 145cm than 138cm, before moving into an adult restraint (American Academy of Pediatrics, 2005). As most children do not reach this height until 10 or 11 years of age (Kuczumski et al., 2002), this implies that many children should continue to use booster seats until well past their 7th birthday.

Influence of standards and restraint design on inappropriate use

For some time, concerns have been raised regarding the way in which child restraint fit is communicated to parents and carers. As discussed above, previously, AS/NZS1754:2004 (and thus manufacturers) designated restraint types based primarily on the child's mass, making it difficult for parents to judge restraint appropriateness unless they were familiar with their child's current weight. Although attempts were made to use the child's age in addition to their weight to communicate the most appropriate child restraint, this caused confusion for parents in cases where there were discrepancies between the child's age and the mass typical for that age (Lumley, 2009). This has become more of an issue as the levels of obesity and generally higher body weights have increased in the Australian population, including children. As a result, children may too easily be shifted from earlier/smaller restraints to the next-sized one before fully outgrowing the previous one (Anderson et al., 2006; Lumley, 2011). To address this, and reduce the confusion for parents, the revised Standard now uses aged-based criteria to define the limits of child restraints (AS/NZS1754:2010).

To complement these changes, a further advance has been made in the design of restraints in order to minimise premature graduation: shoulder height marking. A recent study observing parents and carers choosing restraints with and without shoulder height labels, found that significantly fewer errors were made in judging restraint appropriateness when the restraints included shoulder height marking (Brown et al., 2010). The revisions in AS/NZS1754:2010 include the requirement for shoulder height labeling on all child restraints (except child harnesses). These markings will mostly appear on the seat covers, either directly behind or beside the child's shoulder position and should act as a guide for parents

in relation to when to move a child from one restraint to the next (Brown et al., 2010; Lumley, 2011).

2.2.3 Seating position of child occupants

Only recently has Australian legislation recognised the importance of rear seating of children under the age of 7, which is surprising given that research has long provided a rationale for why children should not occupy front vehicle seats. Studies as early as 1977 revealed that, for children under 15 years of age, passengers seated in the rear seat of a vehicle were at reduced risk of injury and death compared to those in the front seat (Williams & Zador, 1977). Since then, there have been numerous reports documenting the dangers associated with front seating. In the US, analyses of crash surveillance data have indicated that sitting in the rear seat reduces the risk of death by 36% (Braver, Whitfield & Ferguson, 1998), and this effect is consistent across all age groups, irrespective of whether children are restrained (Starnes, 2005). Other crash data analyses have revealed that in addition to reducing the risk of death, children seated in the rear seat, even when unrestrained, are at lower risk of fatal injury (Berg et al., 2000; Starnes, 2005). Not surprisingly, the protective effect of sitting in the rear seat of a vehicle is furthered with the use of restraints (Berg et al., 2000; Glass et al., 2000; Starnes, 2005), and even more so when the restraint is the most appropriate one for size (Durbin et al., 2005).

It may also matter which rear seat children occupy. In a US study examining insurance claim records children seated in the centre seat were found to be 43% less likely to suffer injuries than those seated in either of the rear outboard positions regardless of crash impact direction (Kallan et al., 2008). Other US-based research has shown that children seated on the near side of a collision are at the greatest risk of injury (Arbogast et al., 2000; Arbogast et al., 2009).

Rear seat occupancy has generally been encouraged throughout Australia (Charlton et al., 2006) even prior to the new legislation mandating that children travel in the rear seats, when possible. Moreover, the mandatory use of top tether arrangements for restraints has meant that children using forward-facing or rearward-facing restraints (that is, 0-4 year olds) travel in the rear seat of vehicles as this is where the anchor bolt for the top tether is most often situated (Henderson et al., 2003). Nonetheless, it appears that the proportion of children sitting in front passenger seats is considerably higher in Australia than in other countries. The limited research conducted to estimate the proportion of children occupying front seats has revealed proportions that vary between 25-60% (Edwards et al., 2006; Lennon, 2005), although it should be noted that these Australian studies used school-based travel periods for a large proportion of the observations. Estimates of the extent to which children travel in the front seat elsewhere are much lower: around 20-40% in the US (Durbin et al., 2006; Ferguson, Wells & Williams, 2000) and only 22% in parts of Europe (Segui-Gomez, Glass & Graham, 1998).

One factor that may offer an explanation for this variance is the effect of passenger-side front airbags on children's safety. These airbags have always been optional for vehicles in Australia, whereas they were mandated in the US for vehicles manufactured after 1990. Front passenger-side airbags fitted to US vehicles were designed to ensure that occupants

who were not wearing seatbelts had some form of protection in crashes (as restraint use is also not mandated in many states). For this reason, they fire earlier and with greater force, and remain inflated for longer than the systems seen in Australia, which are instead designed to supplement seatbelts (FORS, 1996). These design differences led to fatalities among child front seat occupants in the US, and were of particular concern since the typical scenario was a low speed crash which might not otherwise have produced an injury had there been no front passenger-side airbag. Given the considerable effort that went into publicising the dangers of US airbag deployment for children in the front seat, this may have led to an increased awareness of the issue and willingness among parents to seat their children in the rear (Wittenberg, Nelson & Graham, 1999).

Choosing to sit a child in the rear seat does not appear to be based on parent knowledge: most parents are aware that carrying their child in the vehicle's rear seat is safer than the front (Bilston et al., 2008; 2010; Lennon, 2006). However, this awareness does not necessarily result in the child actually being seated in the rear seat. Parental decisions about a child's seating location appear to be influenced by a number of other factors. One issue that may hinder or encourage safety conscious behaviour relates to parents' level of awareness of the consequences of safety decisions and their risk assessment. As found in a qualitative exploration of barriers to booster seat use, parents who were more aware of crash-related risks to their children were more likely to want to use a booster seat than parents who were less aware of such risks (Simpson et al., 2002). Similarly, in a qualitative study of the barriers to rear seating of children, parents' risk perceptions, particularly their perceptions about the likelihood of having a crash, presented a barrier for maintaining consistent seating rules (Lennon, 2006). Other identified barriers were parenting styles such as relaxing their rules about rear seating, and social pressure including pressure from children and other adults with different seating rules. Further legitimate reasons to relax seating rules, where parents perceived the risk yet allowed their children to sit in the front seat, were also identified. These included social or psychological reasons such as supporting the child's maturation, child management issues, and physical barriers such as not being able to fit all required restraints into the rear seat of the vehicle (Lennon, 2007).

Some authors have argued that parents are predisposed to make errors in their risk assessment and thus to fail to see a valid need to alter safety decisions. In a study exploring complacency among parents about child restraint misuse it was found that fundamental human cognitive characteristics such as believing in a 'just world', optimism bias and the fundamental attribution error, coupled with everyday aspects of driving, lead to underestimations of the general risks associated with driving (Will & Geller, 2004) and therefore the specific risks to children. Others have also noted that individuals are typically poor at accurately assessing risk and may have difficulty translating the meaning of risk assessment, even when communicated by experts (Lundgren & McMakin, 2004). Thus it may be that parents allowing their child to occupy the front seat of a vehicle wrongly believe that they would not be affected by a crash, are unaware of the risks involved, or underestimate these risks.

Considering all of these psycho-social factors together suggests that ensuring compliance with the new legislation in relation to seating position may require additional effort to overcome parents' misapprehensions in relation to the risks involved.

However, there is evidence that legislation can be effective in itself. The earlier studies on seating position found lower rates of children occupying front seats in those European cities where there had historically been legislation in place on this issue (Glass, et al., 2000; Segui-Gomez, et al., 1998). Recent data from regional areas of Queensland suggest that the inclusion of the requirement for children to be in the rear seat when travelling up until age 7 years may have resulted in a reduction in the proportion of children carried in front seat (Johns, Lennon, & Haworth, 2010). Baseline measures taken prior to the announcement of the legislation (2009) showed that 31% of vehicles had a child in the front seat. This proportion had dropped to 25% when follow-up measures were taken several months after the legislation was enacted in March 2010 (Johns et al., 2010). Although these findings suggest that legislation had a positive effect on reducing front seating, such effects may be limited. For instance, the introduction of child restraint laws in Australia in the 1970s saw immediate improvements in restraint usage rates although these were short lived and soon-after usage rates returned to rates similar to those observed prior to the legislation (Freedman, 1981). Thus, significant and ongoing effort through targeted educational campaigns, as in the past, will need to be considered if the new legislation is to meet and maintain its objectives.

2.3 CONCLUSION

The safety of child occupants has remained a significant issue for a considerable period of time, both in Australia and in many other motorised countries. There is clear evidence that, in the event of a car crash, children are at substantially lower risk of road trauma if they are restrained in a correctly fitted restraint that is appropriate for their size and are seated in the vehicle's rear seat as opposed to the front. Despite this evidence, and notwithstanding the high rates of child restraint usage in Australia, children continue to be placed in restraints that are essentially unable to offer maximum protection due to incorrect or inappropriate use. Fortunately, the recent changes to the Australian Road Rules and subsequent changes to state-based legislation aims to deal with the issues of inappropriate restraint use and front seating of children, while also offering much needed guidance to parents and carers about how to provide optimal protection to their child passengers.

Encouraging parents to use an appropriate restraint and to seat their children in the rear seat is, however, just one important step to improving child safety. It seems just as critical to address the underlying issue of incorrect restraint use, as this problem has persisted over time and is unlikely to be improved by legislative measures alone. Efforts to reduce the rates of installation errors in Australia could come through better education for parents and carers about the intricacy of correct installation and the dangers of poor installation in order to alter the perception that it is easy to fit child restraints or that errors are inconsequential. It appears that this message has not yet been absorbed. Such education could be delivered by professional fitters or health care workers as well as through mass education campaigns in the radio and print media.

Although encouraging parents to use professional restraint fitters is one way to improve their level of skill and awareness in installing restraints, this may be essentially ineffective if parents are unable to access fitters or the associated expense of such services is high, making it difficult for parents to justify. Thus issues of access and cost may need to be addressed as well. Further, there is a need to target programs concerning correct

installation differently for different populations in Australia, given that these issues appear particularly prevalent among those from non-English speaking backgrounds (Bilston et al., 2011; Glanvill, 2000). As well as understanding the factors that hinder optimal restraint practices, information about variables that enhance the correct and proper use of restraints would also be a critical step to informing educational and intervention strategies.

Enhancement of restraint design to facilitate correct installation and reduce misuse, coupled with altering the Australian Standards for child restraints to require such features is also offering benefits in improving selection of appropriate restraints and correct installation. Such measures include the use of age-based (rather than weight or height based) restraint categories, visual indicators on products (e.g. seatbelt path and shoulder height markings) and new instructions and information about restraint devices. Of particular note is the provision of the much-needed larger booster seat for those older children in the restraint 'gap' because they are either too short for adult belts but too heavy for the weight limits for smaller booster seats as specified under AS/NZS1754:2004 or too tall.

Finally, there is a need to assess the impact of efforts to improve children's safety as passengers. Knowledge of the impact of the above changes on parental decisions and compliance is currently very limited, and clear evidence is needed in terms of whether such developments are achieving their objective of encouraging children to travel in appropriate, and therefore, safer, restraint systems. Moreover, it would be useful to examine parents/carers perceptions and acceptance or otherwise of these changes and their experiences of any difficulties or barriers to compliance. Ideally, continuous evaluations of child restraint practices will be required to keep pace with ongoing developments in restraint design and legislative requirements to broaden our understanding of how to provide children with the optimal protection they deserve.

3 WHERE ARE QUEENSLAND CHILD PASSENGERS SITTING AND WHAT RESTRAINTS ARE THEY USING? THE OBSERVATIONAL STUDY

3.1 INTRODUCTION

This study was aimed at investigating effectiveness of the legislation in terms of compliance. To attempt to obtain an objective measure of compliance, an observational method was used. In order to maximise the numbers of observations while minimising costs of data collection, population centres were chosen to reflect those locations where many Queenslanders live and thus travel with their children in cars. Only passenger vehicles with a rear seat (that is two or more rows of seats) and no adult/teenaged front seat passengers were included in the study in order to ensure that drivers were able to choose to comply with the legislation in relation to both seating position and type of restraint for child passengers. In addition, child passengers were defined as those children estimated as aged 12 years or under. This study addresses Objective 1: To estimate the current level of compliance with the new legislation for restraint of children in vehicles in a cross section of population centres; and Objective 2: To identify any variables that are predictive of compliance.

3.2 METHOD

3.2.1 Selecting the suburbs

Observations were conducted at four major Queensland population centres: Brisbane, the Sunshine Coast, Mackay and Townsville. For each of these locations, the Australian Bureau of Statistics (ABS) 2006 Census data was consulted to identify low-middle income suburbs within these centres. Although data collected during earlier studies conducted in Brisbane (Lennon, 2005) did not find any influence of socio-economic status (SES) or income on children's restraint use, many international studies have reported lower compliance levels for populations with lower SES or income. As the current project was concerned with gauging compliance levels as one of the outcome variables, it was decided to err on the side of caution and only select observation sites from low-middle income residential areas. Thus an income criterion was set such that only those suburbs in which the median weekly income for couple families with dependent children was \$1,400 or less were short-listed as potential observation sites. To ensure that suburbs meeting the income criteria had an adequate number of children in the target age range residing in them to provide efficient data collection, an additional criterion of at least 15% of the population falling within the age range of 0-15 years old was used.

Two further inclusion criteria were imposed. As the intention was to select observation sites with potentially high volumes of child passenger traffic, suburbs with primary schools were sought. In addition, to maximise the extent to which parents who were interviewed in the interview study actually lived and drove in the suburbs in which the observations were conducted, suburbs with a medium-to-large shopping centre were preferred (see below for a description of how shopping centres were selected). Selection of suburbs in the north of Brisbane was relatively straightforward. However, the final choice of suburbs was limited by the availability of shopping centres willing to permit access to parents for interviews (see

below). Data was thus collected for Brisbane North only from Keperra, Bald Hills and Bracken Ridge. The findings need to be viewed with this in mind as it may have resulted in some bias to the findings.

Two of the suburbs in the south of Brisbane that met both the income and household criteria and had shopping centres and schools close by, Acacia Ridge and Algester were only 15 minutes drive apart. However, the shopping centres in surrounding these suburbs that consented to the interview study were only 3 minutes drive away from each other. As no alternative suburbs both meeting the criteria and with shopping precincts consenting to having the researchers on-site could be found, it was decided to treat these two suburbs as one and collect the full quota of observations and interviews from them.

Although three suburbs on the Sunshine Coast were initially identified as suitable, shopping centres in Tewantin and Nambour declined to grant permission for the Research Officers to conduct interviews. Thus data on the Sunshine Coast was only collected from Mudjimba and Mooloolaba.

Due to their smaller populations, couple family income data from every suburb in Townsville and Mackay were inspected. Only one suburb was selected for Mackay. Mackay is a gateway to one of the largest mining reserves in Central Queensland and consequently, a large portion of the Mackay population are employed in the mining industry, which is characterised by high incomes. Thus there were a limited number of suburbs that met the income criteria, the household composition criteria, and also had primary schools and shopping centres in close proximity. Therefore, only one suburb, West Mackay, was selected for data collection. The final suburbs for each city are outlined in **Table 2**.

Table 2. Suburbs identified as suitable for inclusion within each Population Centre

Population Centre	Suburbs
Brisbane	Acacia Ridge Algester Durack Bald Hills Keperra Fitzgibbon
Sunshine Coast	Mudjimba Nambour Tewantin
Mackay	West Mackay
Townsville	Vincent Garbutt

3.2.2 Selecting observation sites around schools

To identify State primary schools at which to conduct observations, the Queensland Schools Directory on the State Government Department of Education and Training website was consulted. This directory contains comprehensive information regarding State primary schools in Queensland, including number of students enrolled (current to 2010), and enables the user to search for State schools by entering the name of a suburb into a search box. The names of each suburb were entered to identify 2-5 of the closest State Primary schools

for each of the areas. Schools with fewer than 200 students enrolled from prep-year 7 were omitted under the assumption that the number of observations obtained from them would be too low to be cost effective. The proximity of schools to the selected suburbs was verified using the *Whereis* website to calculate the average distance between the suburb and each school.

In Brisbane and Townsville where data was collected from multiple suburbs, all schools selected as potential observation sites were, on average, no more than 10 minutes drive and 10 kilometres from the suburb. On the Sunshine Coast and in Mackay where data was collected from one suburb and thus a greater number of sites were needed, this distance was extended. On the Sunshine Coast this distance was extended by 5 minutes and 5 kilometres, making the furthest school (Buderim Mountain Primary) approximately 15 minutes drive and less than 15 kilometres away from Mudjimba.

Selection of the observation sites in Mackay was carried out somewhat differently from the other cities. Being a smaller population centre than the Sunshine Coast, there were fewer schools with adequate numbers of students to select from in Mackay. During the collection of data in the intercept interviews in Mackay, a number of respondents indicated they were from Sarina, a suburb of Mackay approximately 30 minutes drive from the centre of town. Although Sarina has a substantial population, there are limited grocery stores and shops locally, thus many residents travel to central Mackay to do their shopping. Therefore, to represent this population of respondents in the observations, one afternoon session was conducted outside Sarina State School, which had a large number of enrolments. The selected schools are listed in **Table 3**.

3.2.3 Selecting where to conduct the observations at schools

Most schools had more than one possible entrance for parent-drivers to use to get to the school gate(s) and it was therefore possible to select different locations at which to conduct observations for any particular school. However, in order to reduce the possibility of counting vehicles twice it was assumed that parents would tend to use the same entrance each day for their children in the morning and the afternoon. Thus each entrance was only observed once. A small number of schools were on main roads and thus only had one route in and out. In this situation, it was not possible to conduct two sessions without potentially counting the same vehicles twice, and thus only a single observation session was conducted at these schools.

Researchers selected a site on the busier side of the road that required vehicles to either slow down (e.g. a corner or a roundabout) or stop completely (e.g. traffic lights). Observations commenced in the mornings at 8.15am and continued until 9.00am. For afternoon sessions, the researchers arrived at 2.30pm and collected observations until around 3.30pm, by which time almost all school traffic had dispersed.

Table 3. Primary Schools selected for observation sites by population centre and suburb

Population Centre	Suburb	School
Brisbane	Acacia Ridge/Algester	Acacia Ridge State School Watson Road State School Pallara State School Algester State School Sunnybank State School
Brisbane	Durack	Inala State School Forest Lake State School
Brisbane	Bald Hills	Bald Hills State School Aspley State School Norris Road State School Bracken Ridge State School
Brisbane	Keperra	Grovely State School Mitchelton State School Ferny Grove State School The Gap State School
Sunshine Coast	Mudjimba	Pacific Paradise State School Maroochydore State School Buderim Mountain State School Kuliun State School
Mackay State School	West Mackay	Mackay West State School Victoria Park State School Mackay North State School Andergrove State School Fitzgerald Primary School Sarina State School
Townsville	Heatley	Heatley State School Annandale State School
Townsville	Vincent	Belgian Gardens State School Currajong State School Cranbrook State School

3.2.4 Selecting other observation sites

In addition to the school sites, other high traffic sites were required in order to ensure that children younger than primary-school age were included in the sample, to capture travel other than school-based travel, and to enhance the cost effectiveness of the data collection. As the interview study (see Study 2 below) was carried out concurrently with the observations, it was decided to use the road ways close to the same shopping centres that were used for the interview study. This selection had several advantages. Firstly, Research Officers were able to ascertain which sections and entrances of each shopping centre attracted parents with children as well as what periods of the day child passenger traffic was greatest. Thus suitable times and entry roads could be selected for carrying out observations. Secondly, Research Officers were able to identify traffic behaviour and thus

suitable places for observations in terms of safety and visibility of vehicle occupants. A third advantage was that researchers were able to verify that some of the parents who participated in the interviews were the same as those included in the observations, thus enhancing confidence that the interview responses were representative of parents whose behaviour was recorded in the observations.

Most shopping centres were busiest with children in the mornings, and thus observation sessions were conducted in the morning from 9.00am to around 10.30am. Similarly to the method used around schools, the Research Officers selected a site leading into the shopping centre that forced drivers to travel slowly (e.g. corners, roundabouts or speed-bumps) or stop completely (e.g. stop sign or traffic light). Due to bad weather, observations outside Canelands Central in Mackay could not be conducted. The selected shopping centres are listed in **Table 4**.

Table 4. Shopping centres and suburbs used for observations

Population Centre	Suburb	Shopping Centre
Brisbane	Algester/Calamvale	Calamvale Central/Sunnybank Hills
	Brookside	Shoppingtown
	Bracken Ridge	Brookside Shopping Centre
		Bracken Ridge Shopping Village
Sunshine Coast	Mooloolaba	Sunshine Plaza
Townsville	Heatley	Castletown Shopping World

3.2.5 Ensuring accuracy of data

In both the school and shopping centre observations, a number of strategies were adopted to enhance accuracy. First, the Research Officers liaised with each other regarding what they believed they had observed in each vehicle after it passed them. Data was recorded only if a consensus was achieved. Second, where the researchers were observing cars stopped at lights, they walked up and down the footpath observing stationary vehicles and ensuring data recorded was accurate. Third, in situations where the observed vehicle was a station wagon carrying more than three children, one Research Officer observed the middle and front seats, and the other observed the very back of the vehicle.

3.3 RESULTS

A total of 1,915 passenger vehicles (with a rear seat) carrying 2,784 child passengers were observed across the four population centres (Brisbane, Sunshine Coast, Mackay, Townsville). About half of the child sample ($n = 1,423$, 51%) was estimated as aged 6 years and under, with 1,361 (49%) estimated as aged 7 or older. Overall, almost two thirds (62.7%) of the vehicles observed were carrying only one child passenger, with a further 30.8% carrying two children and the remaining 6.5% carrying three or more children. Although the original sampling plan was for similar sample sizes in each of the population centres, difficulties in making accurate assessments of the type of restraints that children were wearing resulted in somewhat fewer vehicles included in the observation sample for

Mackay. Overall, observations were rendered more difficult than in previous studies of this type conducted by the researchers due to the rise in prevalence of window tinting in domestic vehicles, which made the view into vehicles from the side impossible in many instances. As a result, the method of selecting observation sites was altered to include only those places where vehicles were forced to stop so that observers had sufficient time to ensure accurate data on the number of child passengers and their restraint status. See **Table 5** for a breakdown of the location and location type for the observations.

Table 5. Number of vehicles observed with 1-4 or more child passengers by population centre

Number of vehicles with 1, 2, 3 or 4 or more child passengers by population centre						
Number of child passengers in the vehicle	1	2	3	4 or more	Totals	
	n (%)	n (%)	n (%)	n (%)	n vehicles (n children)	% vehicles (% children)
Population centre						
Brisbane North	183 (62.5)	95 (32.4)	15 (5.1)	0 (0)	293 (419)	15.1 (14.9)
Brisbane South	342 (66.8)	143 (27.9)	23 (4.5)	4 (0.8)	512 (713)	25.6 (26.0)
Sunshine Coast	293 (63.4)	139 (30.1)	24 (5.2)	6 (1.3)	462 (668)	24.0 (23.8)
Townsville	214 (60.5)	112 (31.6)	24 (5.2)	4 (1.1)	354 (526)	18.9 (18.8)
Mackay	168 (57.1)	100 (34.0)	16 (5.4)	10 (3.3)	294 (458)	15.1 (16.5)
Total	1200 (62.7)	589 (30.8)	102 (5.3)	24 (1.2)	1915 (2784)	100 (100)

3.3.1 Children's seating positions

Of the 1915 vehicles, 611 (31.9%) carried a child in the front seat. In four of these vehicles, there were two children seated in the front, making a total of 615 children (22.1% of the observed child passengers) occupying a front seating position. The majority 542 (88.1%) of these children were estimated as aged 7-12 years, though there were three instances (0.5%) of children estimated to be aged under 2 years travelling in the front seat, and 70 (11.4%) estimated as aged 3-6 years doing so.

3.3.2 Types of restraints and appropriateness for age (0-12 year olds)

Consistent with many similar studies of children's restraint, the majority of children in this sample were restrained in an adult seatbelt (52.8%, 1470 children), regardless of seating position. **Table 6** displays the type of restraint by estimated age of the child and seating position.

As would be expected, front-seated children were almost universally restrained in adult seatbelts (95.4%), though there were a few dedicated child restraints observed in the front seat (ten booster seats, three forward-facing restraints, one capsule). As mentioned above, a high proportion of these children were estimated to be aged 7-12 years (87.8%), but 12.2% (73) of these front-seated children were estimated as aged 0-6 years all except three of these younger children should therefore have been sitting in the rear seat in order to comply

with the legislation (since there were only three vehicles which had a full rear seat as well as a child under 7 years in the front seat).

Table 6. Types of restraints worn and estimated ages of children by seating positions

	Estimated age group of child				Total
	0-6 mths	7mths-2yrs	3-6yrs	7-12yrs	
Seating position					
Front seat					
Restraint type					
Capsule/RF	1	-	-	-	1
Forward-facing	-	-	2	-	2
Booster seat	-	-	7	3	10
Seatbelt	-	1	55	531	587
Unknown	-	-	3	1	4
Unrestrained	1	-	2	8	11
Total					615
Rear Seat					
Restraint type					
Capsule/RF	38	3	-	-	41
Forward-facing	8	367	263	1	639
Booster seat	1	5	356	108	470
H harness	-	-	7	4	11
Seatbelt	-	1	211	671	883
Unknown	-	3	32	7	42
Unrestrained	-	1	51	30	80
Total					2169
TOTALS	51	381	988	1364	2784

While just over 40% (883, 40.7%) of the children travelling in the rear seat were observed wearing seatbelts, most of the remaining children used a dedicated child restraint (1164, 53.7%), with 470 (21.7%) of these seated in a booster seat, 639 (29.5%) using a forward-facing childseat, and 41 children (1.9%) restrained using rear-facing infant restraints/capsules. For 42 children (1.9%) the observer could not tell what type of restraint was being worn (“unknown”) and 80 children (3.7%) were clearly unrestrained. A few children (11, 0.5%) were observed using a child H harness (4 point restraint).

Appropriateness of children’s restraints

Each child observed was given a code of ‘Appropriate’ or ‘Inappropriate’ for restraint status according to the combination of whether the child was in the restraint type and seating position specified under the legislation for the for the child’s estimated age. Thus children estimated as aged 7-12 years were deemed appropriately restrained if using a seatbelt or booster seat in the front or rear seat or if using an H harness or forward-facing childseat in the rear seat. Children aged 7 months to 2 years were deemed appropriately restrained if

they were in the rear seat and using a forward-facing childseat, a rear-facing child restraint or a capsule. Infants aged 0-6 months were deemed appropriately restrained if they were in the rear seat and using a rear-facing infant restraint or capsule. Children estimated as aged 3-6 years were deemed appropriately restrained if they were sitting in the rear seat and using either a forward-facing childseat, a booster seat or an H harness¹. Overall, 2359 (84.7%) of children were appropriately seated and restrained for age in this sample. It was not possible to determine whether the restraint was appropriate for the 42 (1.5%) children whose restraints could not be observed.

For children estimated as aged 0-6 (to whom the legislation applies), 1041 (72.8%) were seated and restrained appropriately, while 350 (24.5%) were deemed inappropriately restrained for age. It was not able to be determined whether the restraint was appropriate for 38 (2.7%) of children in this age group. In contrast, those children who were estimated as aged 7 years and older were statistically significantly less likely to be inappropriately seated and restrained (2.5%) (see **Table 7**).

Table 7. Restraint status (Appropriate or Inappropriate) for observed children by estimated age

Restraint status	Child estimated age group		
	0-6 years (%)	7-12 years (%)	
Inappropriate	350 (24.5) ¹	34 (2.5) ¹	
Appropriate	1041 (72.8)	1325 (96.8)	
Unknown	35 (2.5) ¹	7 (0.7) ¹	$\chi^2 (2) = 303.21^*$, $p < .001$, $\phi_c = .33^\dagger$

¹ These cells had a major contribution to the chi-square result (standardised residuals +/- 1.96)

* Significant < .05

[†] ϕ_c = Cramer's V for effect size (Small = .1; Medium = .3; Large > .5)

Further analyses revealed that the children observed in Townsville and Mackay were more likely to be aged 7-12 years, while those observed in Brisbane South were less likely to be aged 7-12 years (see **Table 8**).

Table 8. Proportions of children observed in each age group by location

Location	Child estimated age group		
	0-6 years (%)	7-12 years (%)	
Brisbane North	226 (53.9)	193 (46.1)	
Brisbane South	418 (58.6) ¹	295 (41.4) ¹	
Sunshine Coast	358 (53.6)	310 (46.4)	
Townsville	224 (42.6) ¹	302 (57.4) ¹	
Mackay	197 (43.0) ¹	261 (57.0) ¹	$\chi^2 (4) = 56.42^*$, $p < .001$, $\phi_c = .13^\dagger$

¹ These cells had a major contribution to the chi-square result (standardised residuals +/- 1.96)

* Significant < .05

[†] ϕ_c = Cramer's V for effect size (Small = .1; Medium = .3; Large > .5)

¹ Although 3 year olds are required to use a forward-facing childseat until aged 4 years, in practice, Research Officers were instructed to use seated height of the child as the estimate of age. However, while it was fairly easy for observers to tell whether a child was aged up to 2 years, it was quite difficult to distinguish 3 year olds from 4 year olds. Thus, children who appeared older than 2 years, but clearly younger than 7 years, were estimated as aged 3-6. This renders the level of appropriate restraint less accurate for children in the age 3-4 years as these will have been deemed appropriately restrained even if they were using a booster seat.

3.3.3 Appropriateness of the restraints and seating positions of children in the age range targeted by the legislation (0-6 year olds only)

In order to examine whether children's seating positions, types of restraints worn or appropriateness of the type of restraint for age differed according to other variables of interest (such as location) more detailed analyses were conducted on the data for those children estimated as aged 0-6 years (n = 1426) separately from the older children.

Seating position (0-6 year olds only)

The number of children in the observed vehicle did not appear to affect whether a 0-6 year old child was seated in the front seat (see **Table 9**). Similarly, no statistically significant differences were found between the locations for whether a child aged 0-6 years was seated in the front seat ($\chi^2(4) = 7.12, p = .130$), with over 90% of vehicles in each location not carrying a child of this age in the front seat. The mean proportion of vehicles with a child aged 0-6 in the front seat was 5.6% (range 3.6% in Townsville, to 8.5% in Mackay).

Table 9. Number of children in the vehicle by seating position (0-6 year olds only)

No. of children in vehicle	Front seat (%)	Rear seat (%)	
1 or 2 children	67 (5.4)	1172 (94.4)	
3 or more children	6 (3.3)	178 (96.7)	$\chi^2(1) = 1.52, p = .218$

However, differences were found for location in terms of the number of child passengers aged 0-6 years. Children aged 0-6 years that were observed in Mackay were more likely to be travelling in a vehicle carrying three or more children while children observed in Brisbane South were less likely to travelling in vehicles with three or more children (see **Table 10**).

Table 10. Number of vehicles carrying either 1 or 2 children, or 3 or more children by location (0-6 year olds only)

No. of children in vehicle	1 or 2 children	3 or more children	
Location	Vehicles (%)	Vehicles (%)	
Brisbane North	204 (90.3)	22 (9.7)	
Brisbane South	381 (91.1)	37 (8.9) [†]	
Sunshine Coast	302 (84.4)	56 (15.6)	
Townsville	193 (86.2)	31 (13.8)	
Mackay	159 (80.7)	38 (19.3) [†]	$\chi^2(4) = 17.81^*, p = .002, \phi_c = .11^\dagger$

[†] These cells had a major contribution to the chi-square result (standardised residuals +/- 1.96)

* Significant < .05

[†] ϕ_c = Cramer's V for effect size (Small = .1; Medium = .3; Large > .5)

Restraint type and appropriateness

Due to the very small numbers of children using a dedicated child restraint in the front seat, as well as the relatively small numbers of children aged 0-6 occupying front seats, only the data for children in the rear seat was included in more detailed analyses on restraint type and appropriateness. **Table 11** shows the types of restraints children aged 0-6 years in the rear seat were observed wearing, where H harnesses have been combined with booster seats to allow for their inclusion in the analyses. For the subsequent analyses, data for children whose restraint type could not be determined, that is, the 'unknown' restraint category, were excluded.

Table 11. Number of children wearing each type of restraint type (0-6 year olds, rear seat only, where restraint type known)

Capsule/ rear facing n (%)	Forward-facing childseat n (%)	Booster seat n (%)	Seatbelt n (%)	Unknown n (%)	None n (%)	Total n (%)
41 (2.9)	638 (44.7)	369 (25.8)	212 (14.9)	35 (2.5)	52 (3.9)	1348 (100)

The number of child passengers in an observed vehicle appeared to influence the type of restraint worn, with children in vehicles with three or more children more likely to be wearing a seatbelt (34.9%) compared to children in vehicles with one or two children (13.4%) (see **Table 12**). Accordingly, children in vehicles with greater numbers of child passengers were also more likely to be deemed inappropriately restrained when seated in a rear seat (37.9%) compared to children in vehicles with fewer children (18.2%) (see **Table 13**).

Table 12. Number of children in the vehicle by restraint type used in a rear seat (0-6 year olds only)

No. of children in vehicle	Capsule /rear facing n (%)	Forward-facing childseat n (%)	Booster seat n (%)	Seatbelt n (%)	None n (%)
1 or 2 children	40 (3.5)	573 (50.1)	329 (28.8)	153 (13.4) ¹	49 (4.3)
3 or more children	1 (0.6)	65 (38.5)	39 (23.1)	59 (34.9) ¹	5 (3.0)

$\chi^2(4) = 52.70^*, p < .001, \phi_c = .20^\dagger$

¹ These cells had a major contribution to the chi-square result (standardised residuals +/- 1.96)

* Significant < .05

[†] ϕ_c = Cramer's V for effect size (Small = .1; Medium = .3; Large > .5)

Table 13. Number of children in the vehicle by appropriateness of the restraint (rear seat only, 0-6 year olds)

No. of children in vehicle	Inappropriate (%)	Appropriate (%)	
1 or 2 children	208 (18.2)	936 (81.8)	
3 or more children	64 (37.9) ¹	105 (62.1) ¹	$\chi^2 (1) = 34.75^*, p < .001, \phi_c = .16^\dagger$

¹ These cells had a major contribution to the chi-square result (standardised residuals +/- 1.96)

* Significant < .05

[†] ϕ_c = Cramer's V for effect size (Small = .1; Medium = .3; Large > .5)

Results of comparisons in restraint type and appropriateness for location revealed that children observed in Mackay were more likely to be restrained in a seatbelt (26.8%) or to be unrestrained (7.8%) compared to children who were observed in the other locations (see **Table 14**). Results for appropriateness of the restraint type for age were similar, with children observed in Mackay (34.6%) more likely to be deemed inappropriately restrained than children observed in the other locations (see **Table 15**).

Table 14. Type of restraint worn by children aged 0-6 years (rear seat only) by location

Location	Capsule /rear facing n (%)	Forward-facing childseat n (%)	Booster seat n (%)	Seatbelt n (%)	None n (%)	
Brisbane North	6 (3.0)	107 (53.8)	47 (23.6)	37 (18.6)	2 (1.0) ¹	
Brisbane South	14 (3.6)	194 (50.0)	96 (24.7)	69 (17.8)	15 (3.9)	
Sunshine Coast	15 (4.5)	160 (47.9)	108 (32.3)	39 (11.7)	12 (3.6)	
Townsville	4 (1.9)	106 (49.8)	73 (34.3)	19 (8.9) ¹	11 (5.2)	
Mackay	2 (1.1)	71 (39.7)	44 (24.6)	48 (26.8) ¹	14 (7.8) ¹	$\chi^2 (16) = 55.29^*, p < .001, \phi_c = .21^\dagger$

¹ These cells had a major contribution to the chi-square result (standardised residuals +/- 1.96)

* Significant < .05

[†] ϕ_c = Cramer's V for effect size (Small = .1; Medium = .3; Large > .5)

Table 15. Number of children aged 0-6 years appropriately versus inappropriately restrained (rear seat only) by location

	Inappropriately restrained n(%)	Appropriately restrained n(%)	
Location			
Brisbane North	41 (20.6)	158 (79.4)	
Brisbane South	85 (21.9)	303 (78.1)	
Sunshine Coast	53 (15.9)	281 (84.1)	
Townsville	31 (14.6)	182 (85.4)	
Mackay	62 (34.6) ¹	117 (65.4) ¹	$\chi^2 (4) = 31.16^*, p < .001, \phi_c = .15^\dagger$

¹ These cells had a major contribution to the chi-square result (standardised residuals +/- 1.96)

* Significant < .05

[†] ϕ_c = Cramer's V for effect size (Small = .1; Medium = .3; Large > .5)

When data on restraint appropriateness were further stratified by the number of children in the vehicle, it appears that children observed in Mackay were significantly more likely to be deemed inappropriately restrained compared to children in the other locations regardless of the number of children in the vehicle, though the effect size was greater for children in vehicles with three or more children (see **Table 16**).

Table 16. Number of children aged 0-6 years in each location by appropriateness of restraint (rear seat only)

Location	1 or 2 child passenger vehicles [*]		3 or more child passenger vehicles [†]	
	Inappropriate n (%)	Appropriate n (%)	Inappropriate n (%)	Appropriate n (%)
Brisbane North	36 (20.1)	143 (79.9)	5 (25.0)	15 (75.0)
Brisbane South	70 (19.6)	287 (80.4)	15 (48.4)	16 (51.6)
Sunshine Coast	39 (14.0)	240 (86.0)	14 (25.5)	41 (75.0)
Townsville	22 (11.9)	163 (88.1)	9 (32.1)	19 (67.9)
Mackay	41 (28.5) ¹	103 (71.5)	21 (60.0) ¹	14 (40.0) ¹

¹ These cells had a major contribution to the chi-square result (standardised residuals +/- 1.96)

* $\chi^2 (1) = 19.42, p = .001, \phi_c = .13$

[†] $\chi^2 (1) = 14.14, p = .007, \phi_c = .29$

ϕ_c = Cramer's V for effect size (Small = .1; Medium = .3; Large > .5)

3.4 DISCUSSION AND CONCLUSIONS

These results suggest that, for school related journeys at least, a high proportion (62.7% overall) of vehicles carry only one child. The majority of vehicles did not have a child passenger in the front seat (67.1%) which is an encouraging sign. Turning to the child passengers, only 22.1% of the 2784 children observed were travelling in the front seat, and most of these were estimated as aged over 7 years. In terms of the types of restraints worn, restraint use was high (95.1%), consistent with other Australian studies of this type, with only

91 (3.3%) children clearly unrestrained and 46 (1.6%) for whom restraint type could not be determined.

Most of the observed children (84.7%) were deemed to be wearing the restraint required under the legislation for children of their age (based on seated height as a proxy for child age). However, results were not as encouraging when the figures were examined separately for children estimated as aged 0-6 years. Only 72.8% of children estimated as aged 0-6 years were deemed appropriately restrained according to the requirements of the legislation, with 24.5% deemed inappropriately restrained (and 2.7%, for whom this could not be determined). While almost all of these children were seated in the rear seat (94.7%), there was a large proportion of 3-6 year olds wearing seatbelts (18.7% of the 0-6 year olds) or unrestrained (3.7% of the 0-6 year olds) instead of using an age-appropriate restraint.

In 2005 the first author reported the results of a study on children's seating positions and restraint use that used very similar methods to this observational study (see Lennon, 2005). In that study, 8.4% of the observed children estimated as aged 0-6 years were found to be occupying front seats. In this current study only 5.3% of the children estimated as aged 0-6 were observed occupying front seats, an apparent improvement. In terms of the use of dedicated restraints, in the current study 77.8% of the 0-6 year olds in the rear seat were observed wearing a dedicated restraint compared to only 70.3% who were observed doing so in the 2005 study. Proportions of unrestrained and unknown restraint use were 3.9% and 2.6% respectively for the current study, compared to 3.6% and 5.1% respectively in the previous study. Taken together, these results suggest that the legislation may have improved both the extent to which children aged 0-6 years travel in the rear seat and the extent to which they are restrained appropriately for their ages when in the rear seat (though as highlighted previously, in the current study the observations may have overestimated the extent to which 3 year olds were using age-appropriate restraints due to way that age was estimated for these children). However, these improvements might be regarded as only moderate, amounting to safer travel for an estimated 10% of children in the 0-6 years age range targeted by the legislation: one in four children of this age still appears to be inappropriately restrained while travelling in a passenger car.

The results also suggest that there may be differences in the level of safe travel for younger children depending on the number of children in the car and where children live. Though it affected only a small proportion of the children in this study, the benefits of the legislation appear to be diminished where there are three or more child passengers, with 0-6 year olds much more likely to be restrained in a seatbelt under these circumstances than children who were sole passengers or had only one other child in the car. The proportions of 0-6 year olds deemed to be inappropriately restrained were significantly higher for Mackay compared to the other cities in this study. This is consistent with other research that has found that restraint wearing rates are lower for rural populations than for urban ones (Henderson, 1995; King, 1986). This is of particular concern since previous research in South Australia, Western Australia and Queensland consistently demonstrates that rural and remote crashes are characterized by lower rates of seatbelt use (Henderson, 1995; Ryan, Wright, Hinrichs & McLean, 1988; Steinhardt & Siskind, 2008; Steinhardt & Watson, 2007). Moreover, in international studies, the driver's use of a restraint has been found to be predictive of whether children are restrained and this pattern is likely to be relevant in Australia.

Several factors may need to be considered in relation to determining the representativeness of this result. As described above, selection of sites for the observations was dependent to some extent on the availability of shopping centres willing to allow conduct of the interviews for the second study (see Section 4). We cannot be sure what level of bias this may have introduced, as it may be that shopping centres servicing predominantly more disadvantaged families or with higher proportions of families with larger numbers of children in the target age range may have been more cooperative than those in more advantaged areas. Though it is not possible from observation alone to determine the reasons for the observed differences in patterns of restraint use, the results suggest that further exploration of the factors influencing the restraint of child passengers in Mackay and other more rural locations is urgently needed, especially considering the extent to which children in Mackay appear to travel without wearing any restraint at all.

4 PARENT PERCEPTIONS OF THE NEW LEGISLATION (NON-INDIGENOUS SAMPLE)

4.1 INTRODUCTION

The aims of this second study were to explore whether parents understand why the new legislation was introduced and what the requirements are for their children, as well as to gauge the extent to which parents support the need for the legislation. In addition, this study sought to identify and explore barriers for parents in complying with the legislation. Thus, the study addresses Objectives 3-7:

- To estimate the level of parent/carer understanding of the purpose of the new legislation;
- To estimate parent/carer knowledge about the new legislation;
- To estimate the level of support for the new legislation among parents of children in the age groups most affected by it (0-7 years); and
- To identify barriers to greater effectiveness of the legislation on parental/carers' perceptions and provide some options for overcoming those barriers.

4.2 METHOD

The interview study with parents was carried out concurrently with the observational study and within the same population centres (Brisbane North, Brisbane South, Sunshine Coast, Mackay, Townsville) and suburbs as far as was possible. Thus the suburbs selected for the interview study were those meeting the criteria of median couple-family incomes at or below the Queensland median couple-family income (set at \$1,400 for the purposes of this study) and which also had reasonable proportions of children living within them (at least 15% aged 0-15 years old). Shopping centres within these suburbs were then identified. To select the shopping centres, the *Yellow Pages* website, and its companion site *Whereis* were consulted. The *Yellow Pages* website was searched to identify shopping centres in and surrounding the selected suburbs and *Whereis* was used to determine the average distance from the suburb to the shopping centre. Due to their high volume of traffic, and the tendency for people to travel greater distances for leisure shopping at major shopping malls (e.g. Westfield, Logan Hyperdome etc.), these were excluded. Average sized shopping centres that had at least one major supermarket, a focus on services (e.g. post office, hairdresser, chemist, butcher, etc.) and a handful of specialty stores were the target. It was assumed that, where possible, parents would prefer to run errands at a close, convenient location to where they lived. Shopping centres of this description in each suburb were identified and contacted to seek permission to approach shoppers for interview. The centres that agreed to host the study are listed in **Table 17**. Quotas were set on the number of parent interviews in each population centre. These were: Brisbane 400 (200 North, 200 South); Sunshine Coast, 100; Mackay, 100; Townsville 100.

Table 17. Shopping centres in which intercept interviews were conducted

Population Centre	Suburb	Shopping Centre
Brisbane	Acacia Ridge/Algerger Durack Keperra Bald Hills	Calamvale Central/Sunnybank Hills Shoppingtown Forest lake Shopping Village Brookside Shopping Centre Aspley Hypermarket
Sunshine Coast	Mudjimba/Mooloolaba	Sunshine Plaza
Mackay	West Mackay	Canelands Central
Townsville	Heatley Vincent	Castletown Shopping World

A convenience sample of parent-drivers of children aged under 7 years was then sought in each of the shopping centres. Trained Research Officers were instructed to approach any shopper who appeared to be aged between 20 and 60 years and invite participation in a brief (10 minute) intercept interview. Consent to participate was sought verbally and Research Officers recorded this on the interview response sheets prior to commencing the interview. Eligibility criteria were that the parent had at least one child in the target age range (0-7 years) and drove the child at least once per week in a passenger vehicle (that is, one with a rear seat). Intercept interview sessions took place between 9.30am and 2.30pm on weekdays.

4.2.1 The intercept interview questions

Initial questions focused on the types of restraints that parents used with each of their children aged 7 years and younger, who had installed these restraints, and whether parents had ever sought professional assistance in installing restraints. Interviewers were instructed to record responses for up to four children in the target age range for each family. To assist parents in identifying which types of restraints they used, parents were shown photographs of six different restraint types (rear facing infant restraint, forward-facing childseat, booster seat, booster cushion, H harness, and seatbelt), each with a child wearing the restraint (with the exception of booster cushions) as well as unoccupied (see **Appendix A**).

The next set of questions was designed to explore parents' awareness and knowledge about the legislation on the restraint of children in Queensland. Questions asked parents whether they were aware that the law had changed recently, if so, how they had found out about these changes, what they thought the main changes had been and what the reason was for making the changes. Parents were also asked whether they now did anything different in restraining their children as a result of the changes in the law. An additional interest in this study was to identify any barriers to using appropriate restraints with children. Accordingly, parents were asked to rate how easy or hard it was for them to use the required restraint with each child. Where parents indicated that particular restraints were hard to use, interviewers were instructed to probe for the main reasons for this. Finally, in order to gauge understanding about the purpose of the changes that were introduced and the level of support among parents for the new legislation, parents were asked to rate their level of agreement (1 = "Strongly disagree" to 5 = "Strongly agree") with 11 statements related to

child restraints or the legislation. Examples of these statements were “Most children were already using the right sized restraints so there was no need to change the law” and “a childseat is safer than a booster seat for children 2-4 years”. **Appendix A** contains a copy of the intercept interview and the response option display materials/aids.

4.3 RESULTS

A total of 490 parents completed the intercept interviews, with around 100 participants coming from each of the centres except Townsville, where only 88 parents were interviewed. These parents reported on the restraints used with 769 children aged under 7 years. The sample was predominantly mothers (89.6%) and a large proportion indicated that they were full time parents (44.3%) probably reflecting the types of locations used for recruitment and the time of day (during normal business hours). Most (89%) had at least completed high school and 40% reported having completed a university degree or higher level of education. Almost half (46.1%) indicated that family income was \$91,000 or more, with a further 37.8% reporting family income as between \$51,000 and \$90,000. Thus only 15.9% of the parents were on low family incomes. The majority of parents (78.0%) reported that they were “Frequently” the person who drove their children and that typically this involved 1-2 trips per day (54.1% of parents) or 3 or more trips (31.6%) with only 14.3% of parents typically driving their children less than once per day. The majority of the parents reported having only one or two children under the age of 7 years living with them (241, 49.2%; and 226, 46.1% respectively). The number of parents interviewed in each location along with the ages and number of children in each age group are displayed in **Table 18**.

4.3.1 Types of restraints used and appropriateness for age of the child

Of the 769 children for whom parents supplied the type of restraint the child used, 433 (56.3%) were reportedly restrained in forward-facing childseats. A further 240 (31.2%) were reported as restrained in booster seats, while 88 (11.4%) used rear-facing restraints and the remaining eight (1.1%) were reported as using either a seatbelt or child H harness. No children were reported as travelling unrestrained. **Table 19** displays the frequencies of each type of restraint by child age groups.

A new variable was created to examine the extent to which children were using an appropriate restraint. A child was deemed appropriately restrained if the parent reported that that the child travelled in a restraint specified as appropriate for the child’s age under the legislation. Children in restraints that were not those specified under the legislation were categorised as inappropriately restrained.

Table 18. Sample characteristics: Number of parents interviewed (by location), number of children in family aged under 7 years, and age distribution of under 7 year olds in the sample by child's age group

Location/population centre		Number of parents interviewed
Brisbane North		94
Brisbane South		105
Sunshine Coast		103
Mackay		100
Townsville		88
Total interviewed		490
Number of children in family aged under 7 years (as reported by parents, whole sample) n(%)		
1		211 (49.2)
2		226 (46.1)
3		16 (3.3)
4 or more		7 (1.4)
Total families		490 (100)
Number of children reported on in each age group (whole sample) n(%)		
0 - 6 months		85 (11.1)
7 - < 12 months		96 (12.5)
1 - < 2 years		96 (12.5)
2 - < 3 years		116 (15.1)
3 - < 4years		137 (17.8)
4 - < 5years		111 (14.4)
5 - < 6 years		67 (8.7)
6 - < 7 years		61 (7.9)
Total children		769 (100)

Table 19. Children's restraints as reported by parents (by child's age group)

Restraint type and number (%) of children reported as using them						
Child's Age	RFCR	FFCR	Booster seat	Seatbelt	H Harness	Total
0 - 6 mths	76 (89.4)	9 (10.6)	-	-	-	85 (100)
7 - < 12 mths	10 (9.5)	86 (90.5)	-	-	-	96 (100)
1 - < 2 years	2 (2.1)	92 (95.8)	2 (2.1)	-	-	96 (100)
2 - < 3 years	-	97 (83.6)	19 (16.4)	-	-	116 (100)
3 - < 4years	-	95 (69.3)	42 (30.7)	-	-	137 (100)
4 - < 5years	-	40 (36.0)	71 (64.0)	-	-	111 (100)
5 - < 6 years	-	11 (16.4)	54 (80.6)	1 (1.5)	1 (1.5)	67 (100)
6 - < 7 years	-	3 (4.9)	52 (85.2)	3 (4.9)	3 (4.9)	61 (100)
Total	88	433	240	4	4	769

Parent practices were also categorised according to whether all the under 7 year old children they had reported on were in a restraint specified for the child’s age under the legislation. Where every child under 7 years in the parent’s care was in an appropriate restraint, the parent practices were categorised as “Appropriate”. Otherwise parent practices were categorised as “Inappropriate”. Results for these two new variables are displayed in **Table 20**.

Table 20. Number of children categorised as appropriately restrained and number of parents with all children aged 0-under 7 years in their care appropriately restrained

	‘Appropriate’ n (%)	‘Inappropriate’ n (%)
Children (0-under 7 years) (n = 769)	691 (90.1)	76 (9.9)
Parents (n = 490)	415 (84.7)	75 (15.3)

As can be seen in **Table 20**, over 90% of the children in this sample were deemed appropriately restrained for age. When these figures were examined in more detail, significant differences were found for appropriateness of the restraint by age group such that children aged 7 months to under 2 years were less likely, and children aged 2 to under 4 years were more likely to be deemed inappropriately restrained (see **Table 21**).

Table 21. Appropriateness of restraint by age group of child

Restraint status	0-6mths n (%)	7mths-under 2 n (%)	2-under 4 n (%)	4-under 7 n (%)	
Inappropriate	9 (10.6)	2 (1.0) ¹	62 (24.5) ¹	9 (3.8)	
Appropriate	76 (89.4)	190 (99.0)	191 (75.5)	230 (96.2)	$\chi^2(3) = 81.49^*$, $p < .001$, $\phi_c = .33^\dagger$

¹ These cells had a major contribution to the chi-square result (standardised residuals +/- 1.96)

* Significant < .05

[†] ϕ_c = Cramer’s V for effect size (Small = .1; Medium = .3; Large > .5)

The majority of the inappropriately restrained children were aged 3 to 4 years (42 children) and reported as using a booster seat instead of a forward-facing childseat as specified under the legislation. This represents only 9.4% (42/445) of the forward-facing child-restraint aged children (that is, those aged 7 months-4 years old) in the sample but 30.7% of the 3-4 year olds.

Appropriateness of children’s restraints also varied across locations, with children in the sample from Mackay more likely, and children from the Sunshine Coast less likely to be inappropriately restrained for their ages (see **Table 22**).

Table 22. Appropriateness of children's restraints for age by location

Location	'Inappropriate' n (%)	'Appropriate' n (%)	
Brisbane North	8 (5.5)	138 (94.5)	
Brisbane South	20 (12.7)	137 (87.3)	
Sunshine Coast	7 (4.5) ¹	150 (95.5)	
Townsville	17 (12.4)	120 (87.6)	
Mackay	30 (17.4) ¹	142 (82.6)	$\chi^2_{(4)} = 19.91^*$, $p < .001$, $\phi_c = .16^\dagger$

¹ These cells had a major contribution to the chi-square result (standardised residuals +/- 1.96)

* Significant < .05

[†] ϕ_c = Cramer's V for effect size (Small = .1; Medium = .3; Large > .5)

Almost 85% of the parents were deemed to have 'Appropriate' restraint practices (see **Table 20**). Further analyses were conducted in order to explore whether the appropriateness of parental restraint practices were related to their demographic characteristics. No differences were found for parent's age [$\chi^2(3) = 6.79$, $p = .08$], or gender [$\chi^2(1) = 0.03$, $p = .87$]. Nor were there any differences on the basis of parental awareness that the legislation had changed: surprisingly, parents who didn't know the legislation had changed were just as likely to appropriately restrain all of their under 7 year old children as those parents who said they were aware of the changes [$\chi^2(1) = 0.13$, $p = .722$].

However differences were detected for location, such that parents in Mackay were more likely to have their children inappropriately restrained, and parents from the Sunshine Coast were less likely to have their children inappropriately restrained than parents in the other locations, $\chi^2(4) = 25.01$, $p < .001$, $\phi_c = .23$ (see **Table 23**).

Table 23. Appropriateness of parent restraint practices by demographic characteristics

Demographic characteristic (parents)		'Inappropriate' n (%)	'Appropriate' n (%)
Location	Brisbane North	7 (9.3)	87 (21.0)
	Brisbane South	18 (24.0)	87 (21.0)
	Sunshine Coast	6 (8.0) ¹	97 (23.4)
	Mackay	28 (37.3) ¹	72 (17.4)
	Townsville	16 (21.3)	72 (17.4)
Gender	Male	8 (10.7)	41 (9.9)
	Female	67 (89.3)	374 (90.1)
Age group (years)	18-24	7 (9.3)	42 (10.1)
	25-29	24 (32.0)	93 (22.4)
	30-39	41 (54.7)	229 (55.2)
	40+	3 (4.0)	51 (12.3)
Parent aware that legislation changed recently?	Yes	64 (85.3)	346 (83.6)
	No	11 (14.7)	68 (16.4)

¹ These cells had a major contribution to the chi-square result (standardised residuals +/- 1.96)

4.3.2 Who installs children’s restraints?

As well as identifying the restraint used with each child under 7 years, parents were also asked to indicate who had installed the restraint and approximately how long ago this had occurred. Responses in relation to the different types of dedicated restraints parents reported using are displayed in **Table 24**. As can be seen, parents primarily installed restraints themselves (343, 44.8%) with the exception of rear-facing infant restraints. For rear facing restraints, 35 of the 88 restraints (39.7%) were reportedly installed by a professional fitter such as the Queensland Ambulance Service. However, more than half of these restraints were reportedly installed either by the parent (28.4%) or the parent’s partner (25.0%). Similarly, although professionals reportedly installed almost one quarter (105, 24.2%) of the forward-facing childseats, a parent or partner installed the majority (309, 71.6%). For only a few restraints (31, 4.0%) parents indicated that although they or a partner had installed the restraint they had subsequently asked a professional to check the installation.

When responses were examined according to participant, just over one quarter (125, 25.5%) of the parent sample had used a professional for at least one of the restraints they were currently using with their under 7 year old children. Of these, 80 (64%) had done so once, 41 (32.8%) had used a professional to install two restraints and four parents (3.2%) reported doing so for three or more restraints (see **Tables 24 and 25**).

Table 24. Installing restraints: Parent reports of how many restraints they had used a professional to install their child’s current restraint and who carried out the installation (by restraint type)

Number of parents reporting having 1-4 restraints installed by a professional fitter (for restraints currently in use by an under 7 year old)	
Number of restraints professionally installed	Number of parents
0 (never)	365
1	80
2	41
3	3
4	1
Total	490

Table 25. Parent reports of who installed their child restraints (currently in use only)

Person who installed the restraint	Type of restraint (dedicated restraints, currently in use by < 7 yo)				Total
	Capsule/ RFCR	FFCR	Booster seat	H harness	
Self	25	186	130	2	343
Partner	22	123	69	2	216
Self/partner then checked by professional	6	14	11	-	31
Professional (e.g. QAS, RACQ, Kidsafe, fitter at baby shop)	35	105	28	-	168
Other (e.g. family, friends)	-	5	2	-	7
Total	88	433	240	4	765

Taking the responses of all the parents together suggests that the majority of parents were aware that professional installation of restraints is available, with 292 (59.6%) parents ever having used such services. Most appear to have used these for the installation of a rear-facing child restraint or capsule, a restraint type which is arguably the most difficult type to install (see **Table 26**). However, it appears that in this sample, most of the children's restraints were installed by either the parent or his/her partner.

Table 26. Types of restraint installed and organisation reported as carrying out the installation (for parents, n = 167, reporting using a professional fitter to install a previous, but not current, restraint)

Parent reports of which professional organisations installed their children's previous (but not current) restraints, by restraint type (n = 167 parents)					
Organisation	Capsule/RFCR	FFCR	Booster seat	Converted RF to FF	Total
Queensland Ambulance Service	101	4	-	4	109
Baby shop	14	3	1	1	19
RACQ	6	2	-	1	0
Kidsafe	5	1	-	2	8
Approved restraint fitter	3	-	-	1	4
Other	7	1	-	-	8
Can't remember/not sure	4	4	-	2	10
Total	140	15	1	11	167

4.3.3 Using child restraints: how easy do parents find it?

Parents who had answered “yes” to the question asking them whether they were aware that the legislation for children’s restraint use had changed recently were asked to indicate how easy or hard (“Very easy”, “Easy”, “Hard”, “Very hard”) it was for them to use the restraint they had indicated with each of the children for whom they were reporting. Of the 410 parents responding in relation to 688 children’s restraints, most (362, 88.3%) reported that all the restraints they used were either “Very easy” or “Easy” to use. Where parents reported that the restraint was “Hard” or “Very hard” to use, they were asked to give the main reason for this, and interviewers noted verbatim the key words in the parent’s response. Overall, 41 parents reported difficulty using a total of 48 restraints (14 capsules/rear-facing child restraints, 19 forward-facing child restraints and 15 booster seats). Only three parents indicated that more than one of the restraints they were currently using was difficult to use. The main reason that parents cited for the restraint being difficult to use were to do with the internal harness adjustment, the adjustment of straps for the restraint or adjusting/using the seatbelt with the restraint (21/48, 43.8%) (see **Figure 3**). Space restrictions in the car were cited for eight of the restraints (16.7%), and the child disliking or getting out of/removing the restraint was cited for seven restraints (14.6 %). For the remaining 13 restraints (27.1%) idiosyncratic reasons were given, such as it being hard for the parent to get the child in and out of the restraint (1 restraint) or that the device used to prevent the child undoing the restraint was time consuming to use (1 restraint).

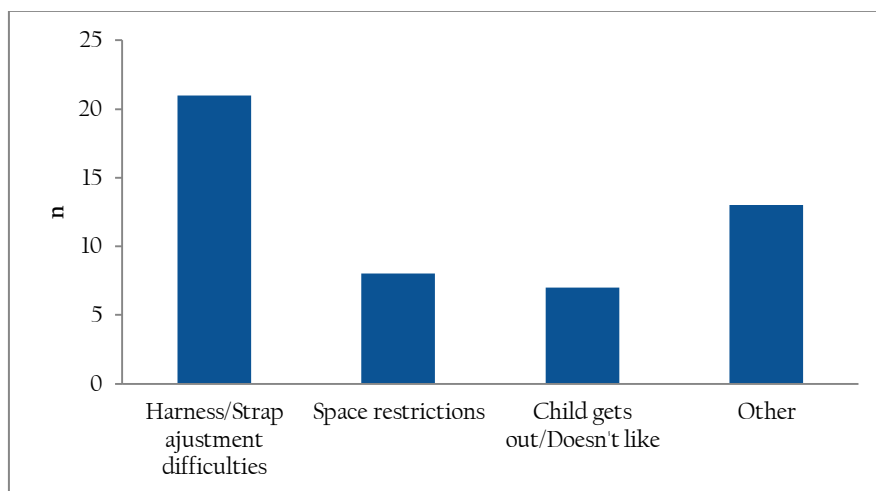


Figure 3. Main reason parents gave for restraint(s) being hard to use

4.3.4 Parental perceptions of the new legislation for restraint of child passengers

A key interest in this study was exploring the extent to which parents understood what the changes to the legislation had been and the rationale for them. Parents who indicated that they were aware that the legislation had changed in Queensland recently (410/490 parents) were asked further questions about this. The first of these was where they had found out about the change. Interviewers were instructed to note the key words verbatim from parents’ responses.

While some parents mentioned more than one source, the most common source that parents recalled having found out about the change to the legislation was from television, with 155 (37.8% of parents) giving this as a response. A few parents were more specific, saying that it had been a news or current affairs television program. Although a variety of other sources were mentioned, each of these accounted for only a few percent of the overall parent responses, with friends and family (13.7% of parents) comprising the largest of these other sources, as can be seen in **Table 27**.

Parents were then asked what they thought the main changes to the legislation were and what the main purpose for these changes had been. Key words were noted verbatim. Encouragingly, most parents (357, 87.1%) indicated that they thought that improved safety was the main reason for the changes in legislation. A further 19 (4.6%) parents gave responses which were interpreted as being more specifically about the adequacy of the previous legislation in protecting children (e.g. “seatbelts not enough”, “premature graduation”), which suggests that slightly over 90% of parents perceived the changes to the law as being about better protecting children. Only 11 (2.9%) parents said they didn’t know and only one parent gave a response mentioning revenue. The other responses given were more idiosyncratic (e.g. “submarining”, “update the legislation”), but it is noteworthy that there were no irrelevant responses.

Table 27. Parent responses to “Where did you find out about the changes [to the legislation]?”

Number of parents reporting having x restraints installed by a professional fitter (for restraints currently in use by an under 7 year old)	
Source mentioned	Frequency (% of responses)
TV	155 (34.6)
Family or friends	56 (12.5)
Health professional, health organisation or police	36 (8.0)
Media (unspecified)	33 (7.5)
Childcare/playgroups	31 (6.9)
Word of mouth	31 (6.9)
newspaper	27 (6.0)
Baby goods retailer	21 (4.7)
radio	18 (4.1)
RACQ or TMR	17 (3.8)
Printed mail pamphlet or magazine	15 (3.3)
School	8 (1.8)
Total (some parents gave more than one response)	448 (100)

When it came to the content of the legislation, the responses were less clear. Key words in parents’ responses to questions were coded into mutually exclusive categories based on whether the details parents gave were complete and accurate or not (see **Table 28**).

Table 28. Parental knowledge about the changes to the child restraint legislation in Queensland, categorised according to completeness and accuracy

Type of response (categorised according to completeness of description and accuracy of information)	Number of parents (%)
Partially complete and accurate knowledge	61 (14.9)
Partially complete, and accurate, but age-specific knowledge	43 (10.5)
Partially complete, uncertain accuracy	161 (39.2)
Partially complete, some accurate, some inaccurate information	54 (13.2)
Incorrect	63 (15.4)
Don't know	28 (6.8)
Total	410 (100)

There were no instances where a parent gave complete information in relation to the content of the changes, and in particular, few parents (13, 3.1%) mentioned the requirement for children to travel in the rear seat until aged 7 years. Thus, as can be seen in **Table 28**, the majority of parents gave responses that were categorised as partially complete. However, about one third of the parents (132, 32%) seemed to be aware of the main requirement that children needed to be restrained in a dedicated restraint until they were older. Around half of these parents (77, 18.6% overall) correctly identified the age for this as until at least 7 years, while others did not specify an age and some gave other (incorrect) ages. Some parents (10.4%) correctly gave the details of the requirements for specific ages of children only. In almost 40% (161) of cases, it was not clear from the response whether the parent's knowledge was accurate (e.g. "Age limits on seats and different seats", "Age increase") and these were categorised as partially complete but uncertain accuracy. There were 63 parents (15.3%) who supplied apparently incorrect information (e.g. "restrain over chest", "H harness compulsory") and 28 (6.8%) who indicated that they didn't know.

In the next section of the interview were parents asked to indicate the extent to which they agreed or disagreed with each of eleven statements. Response options were on a five-point scale, where 1 = "Strongly disagree" and 5 = "Strongly agree". Item wording and order of presentation is displayed in **Table 29** (see also **Appendix A**).

Table 29. Item wording for items assessing parent perceptions of the new legislation and numbers (%) of parents indicating disagreement (“Strongly disagree” or “Disagree”), agreement (“Strongly agree” or “Agree”) or neither agreeing or disagreeing with each item

To what extent do you agree or disagree with the following statements? (response options 1 = Strongly disagree to 5 = Strongly agree)		Disagree	Neither agree nor disagree	Agree
Item 1:	Most children were wearing the right restraint so there was no need to change the law	237 (57.8)	111 (27.0)	62 (15.1)
Item 2:	The new law is easy to understand	44 (10.7)	77 (18.8)	289 (70.5)
Item 3:	The new law is too hard for me to comply with	360 (87.9)	39 (9.4)	11 (2.7)
Item 4:	The new law is too complicated	339 (82.8)	50 (12.3)	20 (4.8)
Item 5:	The new law makes it clear what I need to use with my children	31 (7.6)	57 (13.9)	322 (78.5)
Item 6:	I have done what I need to do in order to comply with the new law	2 (0.5)	20 (4.9)	387 (94.7)
Item 7:	The new law is effective at getting children into the right restraints	26 (6.3)	75 (18.2)	309 (75.4)
Item 8:	Overall, I think we needed the new law	18 (4.4)	65 (15.8)	327 (79.8)
Item 9:	It has been expensive for me to comply with the new law	302 (73.7)	46 (11.2)	62 (15.1)
Item 10:	A childseat is safer than a booster seat for children 2-4 yrs	9 (2.2)	18 (4.3)	383 (93.4)
Item 11:	Children aged 5-7 years are just as safe in a seatbelt as they are in a booster seat	329 (80.2)	45 (10.9)	36 (8.8)

Two items (Items 1 and 8); were designed to examine whether parents thought the legislation was necessary. Of the 410 parents responding, 237 (57.8%) endorsed “Disagree” or “Strongly disagree” to “Most children were already using the right sized restraints so there was no need to change the law” indicating that the majority perceived that compliance prior to the legislation may have been at a lower level than desired. A further 111 (27.0%) had responded at the centre point of the scale (neither agreeing nor disagreeing) while only 62 parents (15.1%) had indicated they agreed or strongly agreed. Response patterns for the other item, “Overall, I think we needed the new law” similarly indicated that parents perceived a need for the new legislation with 327 parents (79.8%) endorsing “Agree” or “Strongly agree” for this statement. Only 18 parents (4.4%) endorsed “Disagree” or “Strongly disagree” to this item while 65 parents (15.8%) neither agreed nor disagreed (see **Figures 4 and 5**).

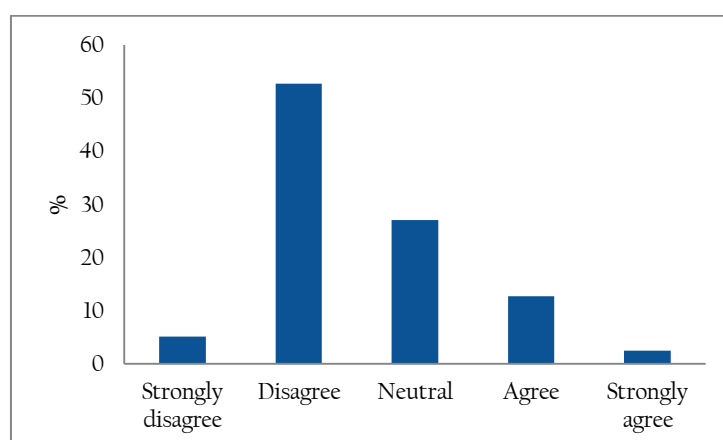


Figure 4. Parent agreement or disagreement (%) with statement “Most children were already using the right sized restraints so there was no need to change the law” (n = 410 parents)

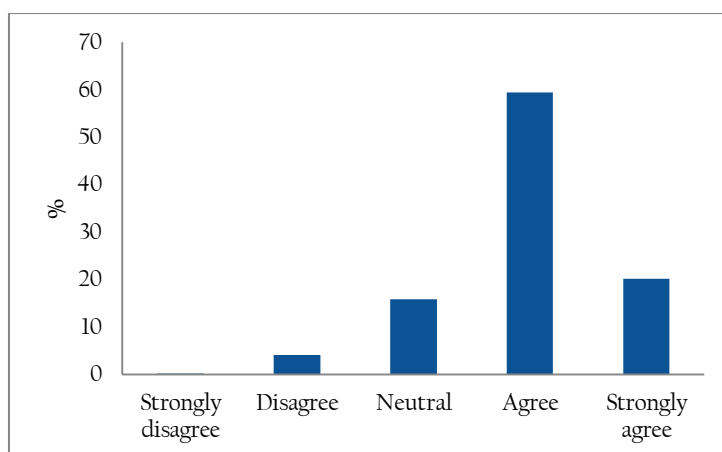


Figure 5. Parent agreement or disagreement (%) with statement “Overall I think we needed the new law” (n = 410 parents)

Two items (Items 2 and 4) were aimed at examining the extent to which parents thought the new legislation was generally easy to understand, while a further item (Item 5) gauged the extent to which parents thought it was clear specifically in relation to their children. Most parents (289, 70.5%) agreed or strongly agreed with the statement “The new law is easy to understand” (see **Figure 6**), while 44 parents (10.7%) indicated “Disagree” or “Strongly disagree” and 77 parents (18.8%) neither agreed nor disagreed. Similarly, 339 parents (82.7%) either disagreed or strongly disagreed with the statement “The new law is too complicated” (see **Figure 7**). In response to “the new law makes it clear what I need to use with my children”, parental agreement was high, with 322 parents (78.5%) endorsing “Agree” or “Strongly agree” for this item (31 parents (7.6%) either disagreed or strongly disagreed, 57 parents (13.9%) neither agreed nor disagreed) (see **Figure 8**).

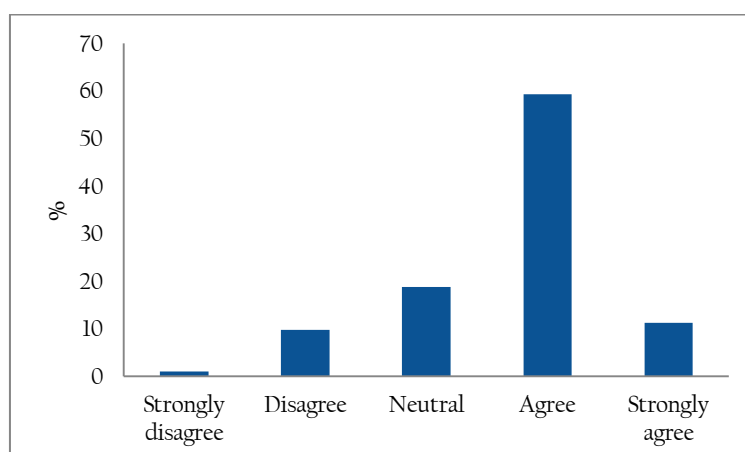


Figure 6. Parent agreement or disagreement (%) with statement “The new law is easy to understand” (n = 410 parents)

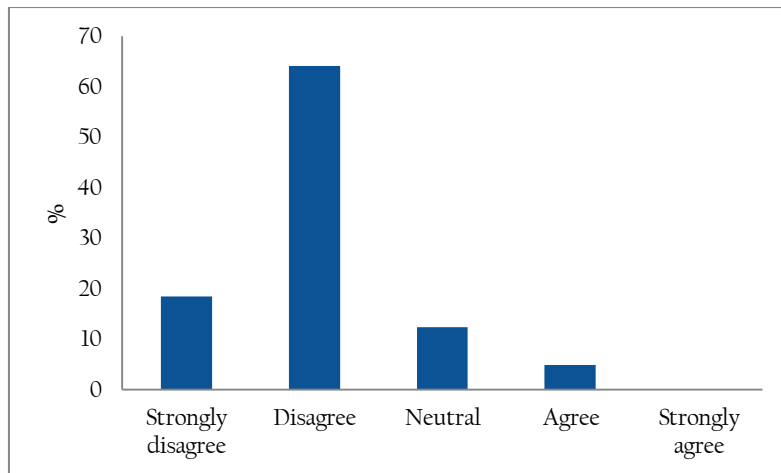


Figure 7. Parent agreement or disagreement (%) with statement “The new law is too complicated” (n = 410 parents)

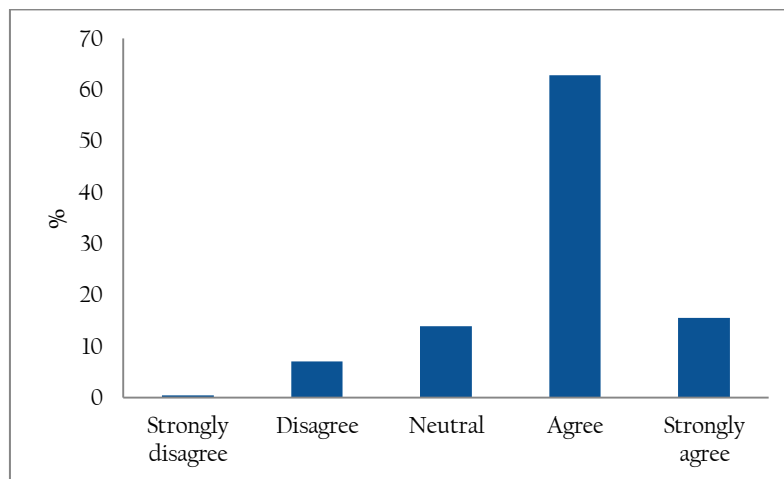


Figure 8. Parent agreement or disagreement (%) with statement “The new law makes it clear what I need to use with my children” (n = 410 parents)

Complying with the legislation did not appear to be a barrier for parents, with a very high proportion (360 parents, 87.8%) endorsing either “Disagree” or “Strongly disagree” to the statement “The new law is too hard for me to comply with” (Item 3). Only 11 parents (2.7%) agreed with this statement (no parents strongly agreed) and 39 parents (9.5%) neither agreed nor disagreed. Most (303, 73.7%) parents also disagreed that it had been expensive for them to comply (Item 9), with 62 parents (15.1%) indicating that it had been expensive for them and 46 parents (11.2%) neither agreeing nor disagreeing. Consistent with these patterns of responses, almost all parents (387, 94.4%) agreed that they had done what they needed to in order to comply (Item 6), only two parents disagreed with this statement and 20 parents (4.9%) neither agreed nor disagreed. **Figures 9 to 11** display these findings.

The final item asked in relation to the legislation was aimed at examining parental perceptions of the effectiveness of the new legislation: “The new law is effective at getting children into the right restraints”. Agreement with this statement was also high, with 309 parents (75.4%) endorsing either “Agree” or “Strongly agree”, and only 26 parents (6.3%) endorsing “Disagree” or “Strongly disagree”. 76 parents (18.5%) neither agreed nor disagreed (see **Figure 12**).

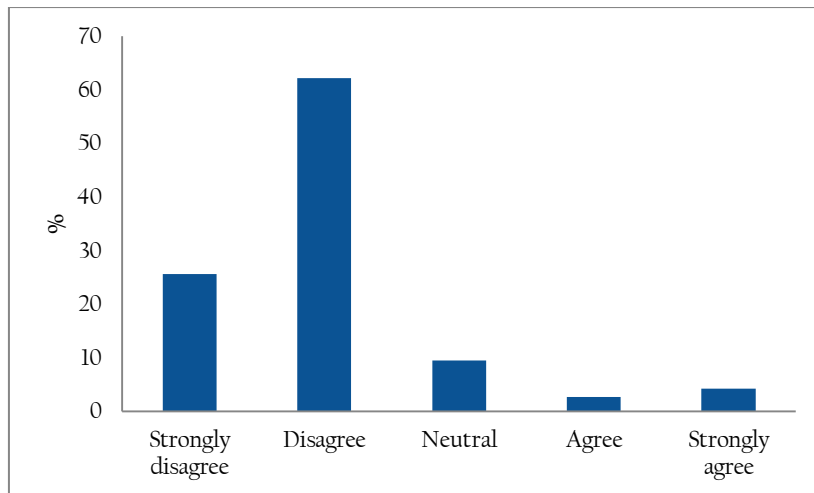


Figure 9. Parent agreement or disagreement (%) with statement “The new law is too hard for me to comply with” (n = 410 parents)

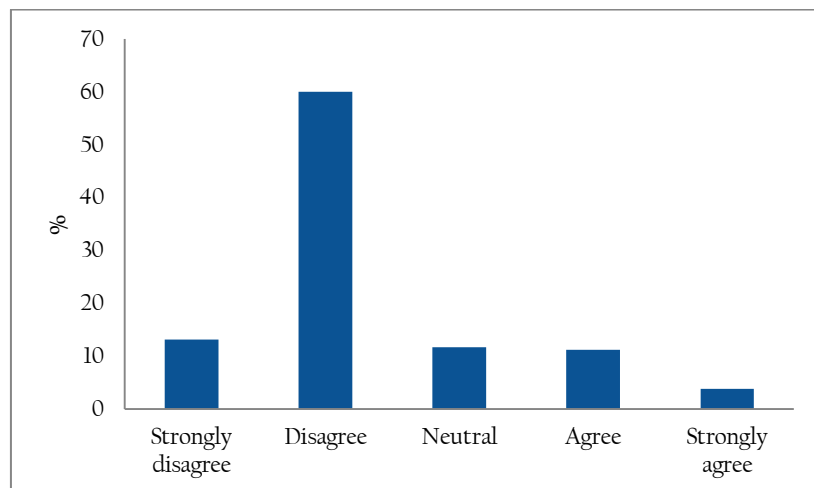


Figure 10. Parent agreement or disagreement (%) with statement “It has been expensive for me to comply with the new law” (n = 410 parents)

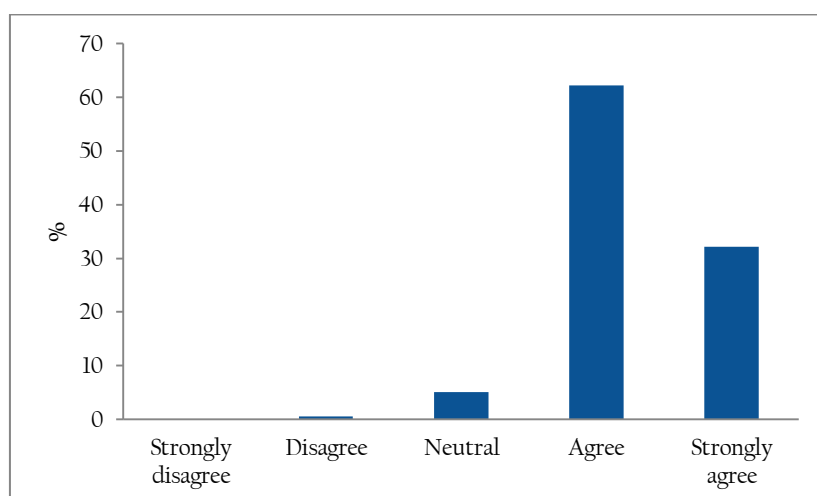


Figure 11. Parent agreement or disagreement (%) with statement “I have done what I need to do in order to comply with the new law” (n = 410 parents)

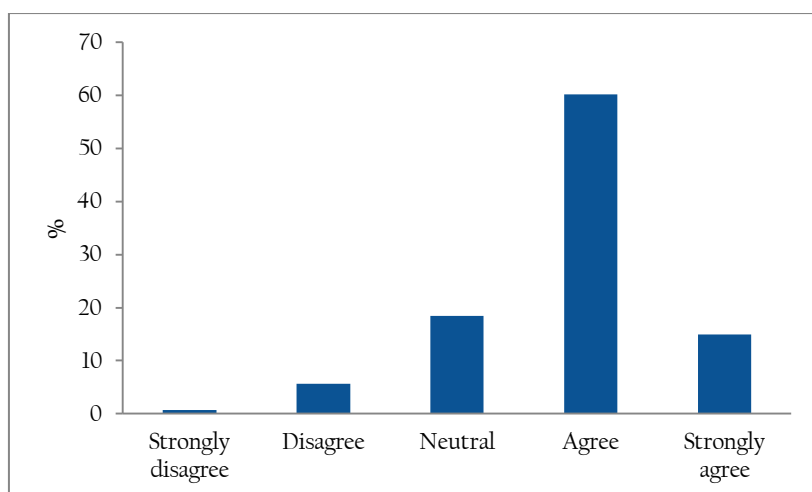


Figure 12. Parent agreement or disagreement (%) with statement “The new law is effective at getting children into the right restraints” (n = 410 parents)

Two of the items were intended to assess parental knowledge about the relative safety of age-appropriate restraints. These were Items 10 and 11: “A childseat is safer than a booster seat for children 2-4 yrs” and “Children aged 5-7 years are just as safe in a seatbelt as they are in a booster seat”. Parents appeared very aware of the safety benefits of childseats, with 383 parents (93.4%) agreeing or strongly agreeing that these are safer for children aged 2-4 years. Only nine parents (2.2%) disagreed with this statement and 18 (4.3%) neither agreed nor disagreed.

Similarly, but not quite so marked, 329 parents (80.2%) disagreed that seatbelts are as safe for children 5-7 years old as booster seats, with 36 parents (8.8%) agreeing that they are and 45 parents (10.9%) neither agreeing nor disagreeing (see **Figures 13 and 14**).

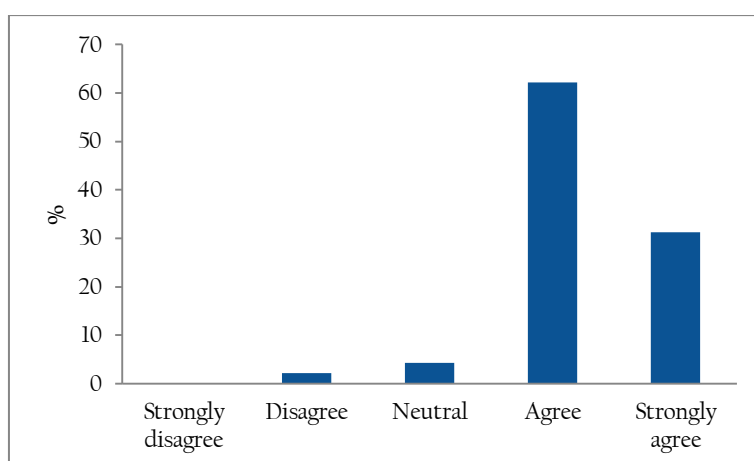


Figure 13. Parent agreement or disagreement (%) with statement “A childseat is safer than a booster seat for children 2-4 yrs” (n = 410 parents)

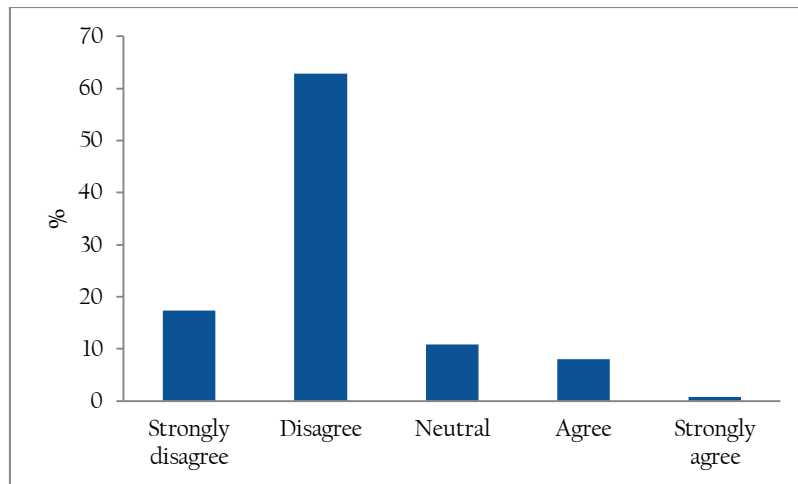


Figure 14. Parent agreement or disagreement (%) with statement “Children aged 5-7 years are just as safe in a seatbelt as they are in a booster seat” (n = 410 parents)

Using the variable created to examine the appropriateness of parental restraint practices, responses to the statements were examined more closely to see whether there were any significant differences between parents who were appropriately restraining their children and those who weren't (see **Table 30**). No differences between the two groups of parents were detected for responses to any of the statements. In addition, no difference between parents with 'appropriate' versus 'inappropriate' restraint practices was found for parental responses to the questions about the content of the legislation (i.e. “What were the changes [to the legislation]?”). That is, parents were just as likely to appropriately restrain their children if they cited the increase in age for children to wear dedicated restraints as those who didn't refer to this aspect of the legislation [$\chi^2(1) = 1.54, p = .464$]. However, as was found for the appropriateness of children's restraints, there were significant differences across locations for the appropriateness of parental restraint practices, $\chi^2(4) = 25.01, p < .001, \phi_c = .23$. Specifically, parents in Mackay were more likely than parents in the other cities to have restraint practices that were deemed inappropriate, that is, to have at least one child aged under 7 years reported as restrained in a restraint not specified as appropriate under the legislation. Conversely, parents on the Sunshine coast were less likely than parents in the other cities to have restraint practices that were deemed inappropriate.

In order to examine whether the parental opinions and beliefs were predictors of parents appropriately restraining their children, a logistic regression was conducted with appropriateness of parental restraint practices as the outcome and the various statements as predictors. Due to the bivariate relationship between location and the outcome variable on some of the predictors, location was included in the regression as a control variable. The statement “I have done what I need to do in order to comply with the new law” was excluded from the regression due to insufficient numbers in some cells. The logistic regression model was not significant [$\chi^2(16) = 17.78, p = .337$].

Table 30. Parental responses to perceptions of the legislation and safety of restraint types by appropriateness of parental restraint practices

	Response options	Parental restraint practices 'Appropriate' n (%)	Parental restraint practices 'Inappropriate' n (%)
Was the parent aware that the legislation had changed recently?	Yes	349 (84.9 of 'yes')	64 (15.1 of 'yes')
	No	68 (86.0 of 'no')	11 (14.0 of 'no')
Most children wearing the right restraint so there was no need to change the law	Disagree	200 (57.3)*	38 (59.4)*
	Neither agree nor disagree	94 (26.9)	17 (15.3)
	Agree	55 (15.8)	9 (14.1)
The new law is easy to understand	Disagree	36 (10.3)	8 (12.5)
	Neither agree nor disagree	66 (18.9)	11 (17.2)
	Agree	247 (70.8)	45 (70.3)
The new law is too hard for me to comply with	Disagree	312 (89.4)	51 (79.7)
	Neither agree nor disagree	30 (8.6)	9 (14.1)
	Agree	7 (2.0)	4 (6.3)
The new law is too complicated	Disagree	292 (83.7)	50 (78.1)
	Neither agree nor disagree	41 (11.7)	10 (15.6)
	Agree	16 (4.6)	4 (6.3)
The new law makes it clear what I need to use with my children	Disagree	27 (7.7)	4 (6.3)
	Neither agree nor disagree	50 (14.3)	7 (10.9)
	Agree	272 (77.9)	53 (82.8)
I have done what I need to do in order to comply with the new law ¹	Disagree	0 (0.0)	2 (3.2)
	Neither agree nor disagree	17 (4.9)	3 (4.8)
	Agree	332 (95.1)	58 (92.1)
The new law is effective at getting children into the right restraints	Disagree	21 (6.0)	5 (7.9)
	Neither agree nor disagree	62 (17.8)	13 (20.6)
	Agree	266 (76.2)	45 (71.4)
Overall, I think we needed the new law	Disagree	12 (3.4)	6 (9.5)
	Neither agree nor disagree	57 (16.3)	8 (12.7)
	Agree	280 (80.2)	49 (77.8)
It has been expensive for me to comply with the new law	Disagree	262 (75.1)	41 (65.1)
	Neither agree nor disagree	39 (11.2)	8 (12.7)
	Agree	48 (13.8)	14 (22.2)

* Percentages for remaining responses are shown for columns, that is, the proportion within 'Appropriate' or 'Inappropriate'

¹ Chi-square test was not performed due to violations of assumptions (cells with a count of 0 and/or greater than 20% of cells with an expected value of less than 5)

The final question asked parents where they would most prefer to obtain information about changes to the child restraint legislation. Response options were displayed presented to parents on a card and consisted of seven options (Department of Transport and Main Roads; Motoring organisations, Childcare organisations, Friend/family; Health professionals; Kidsafe; Specialised internet site). Of the 410 parents responding to this question, almost half (48.5%, 199) indicated that TMR was their preferred source, with a further 18% (74) of parents preferring a "Specialised internet site". Other responses were of the order of 1.5%-9.5%.

4.4 DISCUSSION

In general parental responses to the survey suggest that they are positively disposed towards the new legislation and that the main purpose for the changes, that of making children's travel safer, is clear to them. Moreover, there were high levels of agreement (80-95%) that the new law is easy to understand, makes it clear what parents need to use with children, and is effective at getting children into the right restraints. Parents did not agree that the law was too complicated or hard to comply with. Responses to the initial item about whether parents were already restraining children appropriately (and therefore the changes were not needed) suggest that a large minority of parents were unsure about what other parents were doing, and those who did have an opinion disagreed that the changes were not necessary. That is, they appear to believe that children hadn't been properly restrained previously. One interpretation of this pattern of responses is that parents do not see the legislative changes as an example of over-regulation.

However, while around a third of parents appeared to be aware of the main change in requirements, that is, that children need to use dedicated restraints until they are much older than under the old legislation, only a relatively small proportion of the parents (18.6%) mentioned 7 years old in relation to the age specified in the new legislation. It may be that parents actually don't know how old children should be before they can cease using a dedicated restraint. An alternative explanation is that parents are aware of this age and simply neglected to mention it in response to our question. According to our assessment of parents' reports of the appropriateness of children's restraints for age and parental restraint practices, over 90% of the children targeted by the legislation in our sample were using the type of restraint required under the new legislation, and almost 85% of parents were using the required restraint with all of their children. Moreover, there was no statistically significant difference in the appropriateness of restraint practices on the basis of whether parents mentioned age increases as part of their description of the changes in legislation. It appears that even if parents are unaware of the requirements for older children, it is not necessarily leading to poorer safety outcomes for those children: the bulk of children deemed to be inappropriately restrained in our study were those aged 2-4 years using a booster seat instead of a forward-facing childseat rather than older children using a seatbelt. Of course, parents may have been incorrectly reporting the restraints their older children were using as a result of wishing to appear more compliant than they really are. However, this is not consistent with the levels of inappropriate restraint use reported for 2-4 year olds, where a similar level of misreporting ought to occur. It was disappointing to find that there were no attitudinal predictors of compliance with the legislation, at least on the dimensions that were tapped in this study. This leaves us none the wiser in relation to which beliefs or attitudes might need to be targeted in relation to improving compliance.

An earlier study by the first author used an intercept interview to explore parental practices in relation to children's seating positions. Parents (n = 478) were also asked how old their children were when they had been permitted to start using seatbelts without booster seats. Almost half the parents (48%) who participated indicated that their children had been 6 years old or younger when they had allowed (or would allow, for those with children aged under 6 years at the time) their children to do this. Though the current study did not pose this question, taking the proportion of children aged 4 to under 7 years reportedly restrained in

seatbelts as a proxy, it appears children in this age group are better protected under the new legislation than they were under the old one.

The level of inappropriate restraint choice for children in the 2-4 year age band in the current study is of particular concern and suggests that the message about transition to booster seats has been less effective than the message relating to other age groups targeted under the legislation. Alternatively, it may reflect the particular difficulties with the restraints that are used for this age group (e.g. being too large to fit them into the vehicles) or particular difficulties in child management (e.g. greater resistance to using this kind of restraint from children) or that parent attention is more focused on the minimum weight limits for boosters under the old AS/NZS1754 (i.e. 14 kg) rather than on the new age-based limit of 4 years old. We also cannot tell if there has been an improvement in the levels of appropriate restraint for this age group as the earlier study did not collect this information from parents. This suggests that further research focus on parents of children in this age group in particular.

The finding that children in Mackay were less likely to be appropriately restrained is of concern, particularly as it does not seem to be related to parental awareness of the changes in legislation. Thus interventions aimed at raising awareness of the changes in the legislation may make little difference to parental practices. Moreover, this result is consistent with those of the observational study, though no parent in the intercept interviews reported that a child travelled unrestrained. Thus it may be that parents in Mackay are simply less compliant than parents in other locations in this study or hold beliefs about restraints or their use that are different from those of parents living elsewhere. It may also be that non-use of appropriate restraints with children in Mackay reflects the tendency towards higher rates of non-restraint use of adults that has been found in rural populations in Queensland and other states (Henderson, 1995; Steinhardt & Siskind, 2008; Steinhardt & Watson, 2007). If the results of the observational study are taken into account, another possible interpretation is that parents in Mackay have greater difficulty fitting the number of toddler restraints they require into the vehicles they use, since there was a significantly higher proportion of vehicles in Mackay carrying 3 or more children than in the other locations (though children in vehicles with only 1 or 2 child passengers in Mackay were also more likely to be inappropriately restrained). As the interviews did not pose questions about the vehicle or the number of restraints parents were typically trying to fit into their rear seats, we have no information about this. It appears that further investigation of Mackay and possibly other more rural locations is needed to explore factors that may be influencing parental behaviours in relation to restraints.

News and current affairs coverage appears to have been a primary source by which parents became aware that the legislation was changing. Despite the fact that publicising the changes and the dates by which they were to take effect was conducted in print and radio media for some months prior to the legislation coming into force, it appears that many parents either were not exposed to these or did not register them as a source of information. In terms of their preferred sources of information, parents expressed a preference for information to come from more official sources, with TMR the preference for almost half the parents and a specialised website preferred by a further 18%.

There are two recommendations that we wish to make in relation to these results.

Firstly, the issue of the restraints used with 2-4 year olds appears to require further investigation as well as some form of intervention. That most 2 year olds are being restrained appropriately suggests that parents are not reluctant to use forward-facing restraints per se. However, it is not clear whether parents cease using the required restraints because they are misinterpreting the information about the restraints themselves, are unaware of the age-based restraint requirements, or become unable to keep using a forward facing restraint because of space or other restrictions. To address misinterpretation, provision of some kind of additional parent education that emphasises the use of forward-facing childseats until children are at least 4 years old may be effective. Print media could be considered for this e.g. posters and brochures. This might be most likely to be effective if linked to health-related services that tend to occur prior to the 2 year old level, to capture parent attention before the decision to move a child into the larger restraint occurs. One possibility is to link with health practitioners associated with the 12 months old triple antigen vaccination (measles, mumps rubella, MMR) to suggest that reminders be given. These could just be brief verbal checks about what kind of restraint is being used and the parent's awareness of the need to keep using forward facing childseats up to at least the child's 4th birthday. Posters at childcare facilities might also be effective in this regard.

Secondly, it would seem that further investigation is needed to explore factors that may be related to the beliefs and behaviours of parents in regional and rural locations. Other research on rural and remote populations in relation to road safety has suggested that a significant barrier to the effectiveness of interventions is that residents of such locations erroneously believe that crashes only happen to "tourists" and people unfamiliar with the road and driving conditions in country Queensland (Stitcher & Sheehan, 2006). Thus it may be important for to include exploration of this myth in further investigations. Previous interventions that have sought to increase the use of restraints for adults in rural areas have used local examples and advocates that resonate with rural populations to promote safer behavior and dispel the idea that restraint use is a problem for 'others' and not self for rural drivers (see Stitcher & Sheehan, 2006).

5 WOORABINDA INDIGENOUS PARENT PERCEPTIONS OF THE NEW LEGISLATION

5.1 INTRODUCTION

This section describes the perceptions of Indigenous parents in one community in Queensland, the Woorabinda community. In order to gain some understanding of the experiences of Indigenous parents, TMR in Central Queensland were approached to conduct part of the evaluation of the new legislation. This approach was based on existing research relationships with staff in the region and designed to capitalise on research currently being conducted through the Indigenous road safety trial.

5.1.1 Background to the Woorabinda Indigenous road safety trial

In late 2009, TMR, in partnership with the CARRS-Q, embarked on an Indigenous road safety trial in Woorabinda community in Central Queensland. The trial is underway and funded through the Federal Government's *Indigenous Road Safety Grant Scheme*. The lessons learned from this trial will inform national guidelines for the development and delivery of road safety programs in rural and remote Indigenous communities. Central to the trial is a part-time local Indigenous Project Officer position (held by Kylie Major-Oakley) based in Woorabinda. While technically employed by CARRS-Q, this position works as an integral member of Central Region's TMR Road Safety Team.

The trial addresses a range of community-identified road safety priorities including:

- (i) access to licensing services with a strong road safety component;
- (ii) support for novice drivers to achieve the 100 hour supervision requirements (a significant barrier for remote communities);
- (iii) education regarding restraint use, particularly for children; and
- (iv) roadworthy vehicles.

Strategies to address these priorities have focused on "integrating road safety into other aspects of community life" through cross-agency partnerships, resource sharing and building on existing community capacity.

As restraint use, particularly for children, is a community priority in Woorabinda, it was decided to approach the community to participate in the project. Participating was promoted as an 'opportunity to share' and 'gather information', as opposed to 'research' which can have negative connotations in the Indigenous setting. Given the importance of restraint use for children in Woorabinda, they were more than willing to participate in a focus group ('yarning session'-described further below) to 'gather information' about the issue.

5.2 Method

Colin Edmonston (Manager, Road Safety – Central Region) from TMR and Kylie Major-Oakley (Road Safety Officer, Woorabinda) agreed to conduct the research on behalf of CARRS-Q. Using a local facilitator (*community navigator*), who can vouch for the

genuineness of the lead agency (in this case, CARRS-Q), greatly increases the credibility of the project among Indigenous communities. The community navigator is also integral in identifying who should participate and assist with any communication or language barriers.

The local facilitators elected to use a focus group (*yarn up*) data collection process as opposed to the structured questionnaire that was used in the non-Indigenous parent study described in Section 4 above. This method was deemed more culturally appropriate as it uses qualitative techniques which are better aligned with the Indigenous 'oral tradition'. In addition, due to language and numeracy differences, there are inherent comprehension problems in using data collection tools that are heavily reliant on Likert-type scaling with Indigenous populations.

To ensure that the information collected from Indigenous parents was focused on the same issues as that from non-Indigenous populations, the facilitators chose the following four 'yarning topics' to guide the focus group discussion:

- Levels of support for the new child restraint requirements;
- Levels of understanding of the new child restraint requirements;
- Levels of compliance with the new child restraint requirements and perceived barriers; and
- Possible opportunities for external agency support to increase compliance.

A single focus group was conducted at the Woorabinda Daycare Centre (a non-threatening environment) and discussions were not audio or video-recorded in order to maintain participants' sense of ease. However, in order to capture the key themes and issues discussed under each of the four yarning topics, facilitators took notes including verbatim comments from participants. In accordance with the eligibility criteria, all participants ($n = 11$) had children under eight years of age in their care and self-reported driving a passenger vehicle at least one day per week.

5.3 Findings

The following section provides a 'data capture' of themes that were discerned in the discussions for each of the yarning topics. It is not an exhaustive list of all issues discussed in the forum. Direct quotes from participants are imbedded in summaries to illustrate themes.

The researcher summary of themes was shown to the parents who had participated in the discussion once it had been written up. This allowed participants to verify that the themes identified were an accurate reflection of the discussion or to correct any misrepresentation.

Parent responses to the yarning topics are discussed under the headings of understanding of the new legislation and support for it, and barriers to compliance,

5.3.1 Understanding of the new child restraint requirements and support for the changes

Given the strong role that family plays in Indigenous community life and the younger demographic profile in most Indigenous communities, it was not surprising that there was unanimous support for any initiative that "... makes kids safe". The group indicated that they "... strongly support the new child restraint rules".

"The painted sign on the way in to the joint says – 'Our children are our future' – That's how we think in Woorie. We have lots of kids and want them to grow up and be safe. Buckling them up in the car is one way to do that".

The focus group indicated that their understanding or knowledge of the new child restraint laws is "about average" or "middle of the road".

However, their level of understanding seems to have increased since the inception of an ongoing child restraint education program and hire restraint scheme introduced through the Woorabinda Daycare Centre in May 2010.

"We didn't know much about it [road safety] but it's a big deal here now. Kylie works for Transport. She lets us all know what we need to do. She comes down here [Daycare Centre] and tells us Mums why we need to put our kids in 'em [restraints] and what ones to use. She's a Mum just like us. ... The Transport mob also gave some [restraints] to the Daycare Centre for us all to share if we don't have 'em. Some of the Mums whose kids are big now have also given some in for other people to use which is good. ... The cops tell us to borrow some [restraints] if we don't have 'em as well".

The child restraint hire scheme has also been complemented by road safety education in the local primary and secondary schools. In particular, the local schools adopted road safety as their art theme in Term 3 of 2010 and painted nearly 200 conference satchels for last year's National Indigenous Road Safety Forum (see **Figures 15 and 16**).



Figure 15. Kylie Major-Oakley (left) and Colin Edmonston (right) demonstrating child restraints at Woorabinda



Figure 16. Conference satchels painted by Woorabinda primary school children as part of incorporating road safety into the school art program, 2010

The group seemed to have sound understanding of the requirement to only use restraints that meet Australian standards. This has been part of recent local education.

The discussion suggested that the increased availability of restraints through the hire scheme, coupled by ongoing community education, has “*raised the profile of road safety in Woorie*” and meant “*more kids are buckled up*”. When asked to estimate local compliance (“*how many do the right thing all the time?*”), the group thought “*... about half of our mob – maybe more ... It’s more since Kylie came along*”.

5.3.2 Perceived barriers to compliance

Much of the focus group discussion was about perceived and actual barriers to compliance with the restraint laws. A summary follows:

- The primary barrier identified was the **cost of buying new restraints**.
“Most of us around here are on Centrelink so we can’t afford the boosters and stuff ... so some people don’t use ‘em. The hire scheme has at least given us a few new ones to use”.
- The cost issue is further exacerbated by the fact that parents **believe that using second-hand restraints is not permitted**.
“Something is better than nothing ... I can’t see why we can’t use ones that other people don’t need any more”.

The group indicated that some locals have donated second-hand restraints (which appear in good working order) to the hire scheme to increase the number of restraints available in the shared pool.

- The group also discussed the **difficulty in retrofitting/anchoring restraints in older vehicles and utes** which are common in Indigenous and remote communities. This is one of the more frequent customer enquiries to TMR in Central region.
- The **lack of qualified installers** was highlighted as another substantial barrier to compliance.

"We need a few more locals who can show us how to fit the things. There's been a couple of special days when we've got Kylie in and the cops and daycare staff help, but we need something more often ... Maybe the clinic staff could be trained up".

- The **criteria for selecting the appropriate restraint** was also seen as a barrier. The promotional material regarding the program provides guidelines for selecting the correct restraint based on the age and weight of the child. This causes confusion for parents, creating doubt about what is the more important criterion, especially where children are larger or smaller for age: *"What do you do with older kids that are real small and bigger kids that are young?"*

However, participants commented that promotional material developed by the NSW Roads & Traffic Authority as part of the *"Bring the Mob Home Safely Campaign"* is better than the Queensland brochures in this respect:

"Kylie give it [the material] out to us on Fatality Free Friday ... It has pictures which are easy to understand".

- Another source of confusion influencing the consistency of compliance appears to be beliefs that short trips are safer than longer ones, that is, the **length of journey (i.e. short versus long trips) matters:**

"I make sure I've got the kids in the right restraints if I'm heading to Rocky [long trip] ... I don't worry about it if I'm just driving around Woorie [short trip]".

- Finally, the group suggested that lower levels of vehicle ownership and the **shared use of community vehicles** reduces compliance.

"Many people can drive the same vehicle in a day ... It's not easy to chop and change with different types of seats. We don't have many cars and they are being used all the time".

5.4 Conclusions and opportunities for external agency support

Indigenous parents appear to support the child restraint legislation and to understand its primary intent to better protect children. They expressed willingness to comply and believed that around half the parents in the community do comply.

However, several barriers to compliance or to consistency in complying were identified, and some of these present significant obstacles to ensuring that all children wear the most appropriate restraints on every trip.

Based on the issues raised in the Woorabinda focus group discussion, there appears to be a few key strategies that could be undertaken by external agencies to increase compliance in Indigenous communities.

Firstly, there is a real need for key personnel in Indigenous communities – central points of contact - to be trained in the correct use, fitting and installation of restraints to ensure that this expertise is readily available to the community. It is recommended that the initial candidates for training should be those staff that deal regularly with mothers (clinic staff,

child safety workers, daycare staff, etc.). There may even be potential to build restraint use education into health authority programs for new mothers.

Secondly, there appears to be several misperceptions that should be addressed. The most critical of these is that there is no risk associated with non-use of restraints on short trips, so restraining kids for in-town travel is not required. However, other erroneous beliefs in relation to the criterion for selecting a restraint, what to do if children are out of size, and whether second-hand restraints can be used are also important and would likely affect compliance levels. Dispelling these myths should be the focus of any future educational initiatives.

Thirdly, increasing the resources available to schemes such as the hire scheme should be considered. This could take the form of providing more restraints for hire, extra personnel to assist with promoting its use, or duplicating the scheme in other locations/communities.

Finally, the possibility of sharing culturally-appropriate educational resources (like the “*Bring the Mob Home Safely*” restraint promotional material) across jurisdictions should be further explored.

6 KEY STAKEHOLDER EXPERIENCES WITH THE NEW LEGISLATION

6.1 OVERVIEW

This study was designed to explore whether the new legislation had an impact on other groups within the community as well as to determine the level of support and satisfaction among such groups for the new legislation. It addresses the impact of legislation on stakeholders and Objective 8: To assess the level of support for the legislation among stakeholder groups and the community generally. In addition it addresses Objective 9: to assess the impact of the legislation on other stakeholder groups.

6.2 METHOD

Qualitative methods, in the form of telephone interviews, were chosen for this study in order to obtain more in-depth and detailed information from stakeholders particularly in relation to their perceptions and experiences with the new child restraint legislation. This type of information is generally more difficult to obtain through quantitative methods.

6.2.1 Sample recruitment

A convenience sample of 27 employees was recruited from organisations identified as likely to be concerned with issues of child passenger safety. Advice was sought from the funders of the project on the types of organisations that should be included in this study and in addition, members of the Child Restraint Education and Safe Travel committee (CREST) were invited to identify key stakeholder groups. This process resulted in a list of organisations including: Kidsafe, Queensland Ambulance Service, Queensland Police Service, the Queensland Injury Surveillance Unit, TMR, RACQ, specialist childcare product retailers selling child restraints, department store retailers of child restraints (e.g. Target, K-Mart), specialist child restraint fitters/installers, pediatricians, childcare centres and out of school hours care providers, and family daycare providers.

CREST members provided introductions to key personnel within their own and other key organisations and participation was then sought from key employees. For remaining stakeholder groups, Research Officers developed lists of retailers, childcare and family daycare providers using internet searches and snowball sampling. In relation to the larger organisations, such as retailers and childcare providers, researchers attempted to include organisations located in the cities in which the interview and observational studies had been conducted in order to include perceptions from people outside the Brisbane area as well as those within Brisbane.

Invitations to participate were made via telephone, email or personal approach. Research Officers explained the purpose of the study and provided a copy of the participant information sheet as well as the schedule of questions to those people who expressed an interest in participating. Larger organisations were asked to permit the researchers to interview an employee whose work role closely involved working with parents, child restraints, or children in the target age range. Interviews were then carried out during the

period July-September 2011. While inclusion of some key organisations was straightforward, recruitment of childcare centres and of larger retailers of child restraints proved problematic: refusal rates were high, with lack of relevance of the project to the organisation often given as the reason. In the end, no large retailers agreed to take part. However, several childcare centres did agree to participate, and 4 of these are included in the study. In contrast, family daycare providers were enthusiastic and very keen to be included. For this reason there are nine family daycare centres, including one from Gympie and one from Bundaberg, represented in the interviews. Although it was originally intended that Queensland Police Service would be included in the interviews, due to being unable to secure the necessary permission within the time frame for the data collection this did not eventuate. The breakdown of interviewees included in the study by the type of stakeholder group and location are outlined in **Table 31**.

Table 31. Types of organisations from which interview participants were drawn by location

Type of Stakeholder	n	Location
Childcare centres	5	Brisbane South (3), Brisbane North (2)
Family daycare providers	9	Brisbane South (4), Brisbane North (3), Bundaberg, Gympie
Specialist retailers of baby products	3	Brisbane city, Sunshine Coast (2)
Restraint fitters	5	Brisbane South, Brisbane North, Brisbane city, Redcliffe, Ipswich
Statewide organisations (QAS, Kidsafe, RACQ, QISU, TMR)	5	Head offices in Brisbane
Total	27	

6.2.2 Materials and procedure

A semi structured interview schedule was used to conduct telephone or face to face interviews lasting between 10 and 30 minutes. Interviews were conducted by the first author and two Research Officers, and notes including verbatim comments were taken during the interviews. Interview questions were structured around determining the impact of the legislation on employee work roles or the organisation, the stakeholders' perceptions of the impact of the legislation on parents, opinions about the overall effectiveness of the legislation, and their satisfaction with various aspects of the implementation of the legislation. All questions except the final two were open-ended. The final two questions asked for participant ratings of their levels of satisfaction with aspects of the legislation and its impact, and their perceptions of effectiveness of the legislation. These questions used 5 point Likert-type scales. **Appendix B** includes a copy of the full interview schedule.

As mentioned above, information sheets and a copy of the interview question schedule were provided to prospective participants via email prior to the interviews. Verbal consent to the interview was obtained and noted on the interview record sheet prior to the start of each

interview. Interviewers also explained that although notes would be used to allow a summary of the issues and themes raised, information would only be reported in aggregate form and individual participants would not be identified. However, consent was sought to identify participating organisations and include them as contributors to the study.

6.2.3 Analysis

Thematic analysis was conducted on the notes from the interviews (Braun & Clarke, 2006). The analysis was both theoretically and empirically driven, addressing the specific research interests of this section of the project as well as endeavouring to remain open to unanticipated issues that emerged from the interviews. Each interview record was carefully examined, giving equal attention to the response material for each question and coding the issues discussed by each interviewee. Themes were then identified through collating codes and creating a thematic map which was reviewed to ensure themes were internally meaningful, and distinct from each other.

6.3 FINDINGS

6.3.1 Impact of the legislation on stakeholder organisations

Overall, the stakeholders perceived that the legislation had minimal to moderate impact on them or on the organisations to which they belonged. These perceptions appeared to be influenced by extent to which the day-to-day business of the organisation involved child restraints. Thus those interviewees from stakeholder organisations that deal with restraints as a small part of their day-to-day business tended to perceive minimal impact from the legislation on the organisation, whereas those from organisations that deal with restraints as a major part of their business reported a larger impact from the introduction of the legislation. However, this impact was perceived as being more pronounced in the very early period, when the legislation was first introduced, and as having become much less of an issue in the intervening 18 months. The effects included increases in the number of parent enquiries, needing to purchase new equipment (e.g. restraints and anchor bolts), needing to ensure staff were trained and educated about the new requirements, and needing to ensure that parents were better informed. This last effect involved the preparation and dissemination of informational material (e.g. newsletters, brochures, fact sheets), particularly for those larger, state-wide organisations perceived as having a responsibility to provide leadership and guidance to parents on matters of children's safety. While for some of these organisations such updating is part of the normal course of their business, for others it represented a larger undertaking.

A number of issues were perceived to have arisen for organisations due to the introduction of the legislation, and interviewees described various ways in which organisations attempted to address these. The most common issues reported by the stakeholders included additional costs to the organisation, the pragmatics of ensuring that employees or parents complied with the legislation, confusion about what the requirements of the legislation actually were, and needing to ensure that staff were appropriately trained or had the relevant knowledge about the legislation. This last issue appeared to be exacerbated by the conflicting information from various sources. Some of these were perceived as relatively 'official' sources while others were not, but were somewhat influential. For example, in the

early stages, because other states had already enacted changes to child restraint legislation there were current affairs and news/media reports in relation to the impact of this (some of it sensationalist in nature). As these were often about other states with somewhat different legislative requirements from those for Queensland, this created confusion and anxiety among parents. However, it was of particular concern to participants that the information available from official sources in the early stages of the implementation of the legislation did not appear to be coordinated and there were inconsistencies about the content of the legislation. This too created confusion. A common point highlighted by participants is that despite the legislation moving to age as the main criterion for which restraint type children should be using, parents are still referring to weight and height criteria and becoming confused. The most common organisational response reported in relation to these issues was training and education of staff, and actively seeking correct information which could then be disseminated to parents.

Perceptions of the effect of the changes in legislation on specific stakeholder groups

Childcare centres. Of the stakeholder groups interviewed, childcare providers seemed to be the least affected by the new legislation. In the main, they reported little or no impact on their day-to-day business, and issues raised by the legislation were perceived to be minor. One childcare organisation which provided before and after school care found that they had to meet the cost of installing new anchor points in the bus used for picking up and dropping off children. It might be expected that other centres offering this service would be similarly affected.

Family daycare providers. The family daycare providers interviewed reported a significant proportion of their jobs involved the use of children's restraints. Most said that they deal with them at least daily, and that the introduction of the new legislation had resulted in an increase in their day-to-day dealings with restraints. Issues raised were mostly operational in nature, including managing the number of children and restraints needed when providers were transporting children in their care. Interviewees also reported that there had been difficulties interpreting the legislation, including conflicting advice and misinformation appearing in the media. Common areas of concern were fitting three car seats in the back, front passenger seat arrangements, and the correct restraint selection for children transitioning from one restraint type to another. Cost was also raised by a number of interviewees as an issue, as many had to purchase new equipment (in some cases, purchasing a new car was considered) to meet the requirements of the legislation and carry the children in their care (often transporting a number of young children at once).

The issues were addressed by the family daycare organisations through increasing the education they provided to daycare mothers about the legislation. This involved actively seeking information from relevant bodies and provision of training through the resource coordinators and associations, as well as implementing internal monitoring systems in relation to checking of restraints.

Specialist retailers. Retailers perceived two main impacts on them from the legislation. There was a perception that there had been an increase in the volume of parent enquiries about restraints and thus the need to provide accurate information. The second was the need to provide more staff training and education. The retailers interviewed reported that up to 50% of their working day involved child restraints, and that this had increased with to the

introduction of the legislation. However, increased parent enquiries and the time involved in addressing their questions had not translated to an increase in sales. Organisations responded to the need to educate staff on the laws to better equip them to respond to the increase in enquiries by providing in-house training sessions and individual coaching to staff.

Restraint fitters. The restraint fitting organisations interviewed varied in the extent to which child restraint fitting and installation was part of their day-to-day business. For some interviewees, fitting/installing or checking restraints comprised 100% of their role, whereas for others it represented less. Those that dealt with child restraints a lot reported a noticeable increase in workload, primarily from parent enquiries, just prior to and immediately after the introduction of the legislation. The number of parent enquires has now reduced some, however the need to spend more time with parents during restraint fitting is still apparent in order to respond to their enquiries and ensure that parents have understood the information provided. Some organisations responded to this issue by employing more staff and monitoring workloads at an organisational level.

Statewide organisations. For organisations in this study that provide statewide services to parents, restraint-related services comprise only one of a number of services for which they are responsible. In Queensland, unlike NSW where there is a system of authorized restraint fitters, there are no statewide organisations entirely devoted to restraint fitting or installation. Similarly to other groups, interviewees in this group also reported that there had been a spike in parent enquiries to the organisation during the introduction of the legislation. In addition, interviewees believed there had been a change in the range of enquiries fielded, with increased parental awareness about restraints cited as the reason for receiving enquiries that were more specific than previously. Issues due to the new legislation for these stakeholders were primarily related to providing clarifying information for parent to address their confusion. Perceptions that the available information was not accurate or detailed enough prompted some organisations to develop their own information products such as brochures, website pages and fact sheets to ensure correct information was available. Organisations also responded by providing staff training to ensure a good understanding of the legislation.

6.3.2 Perceptions of the impact of the changes on parents

Interviewees were asked a number of questions in relation to their perception of how the legislation has affected parents, including the overall impact, the main issues for parents, and the types of questions and concerns parents raised regarding the legislation. They were also asked to comment on their observations about the most common fitting errors they or their fitters encountered in checking and installing restraints for parents.

Overall, interviewees thought that the effect on parents had been positive in the long run, with parents becoming more aware and knowledgeable about restraints and the need to properly restrain children. Some thought there had been a positive impact on those parents or grandparents who were not transporting children very often and might previously have used only seatbelts, prompting them to arrange for installation of dedicated restraints instead. However, some interviewees also thought there had been financial implications for parents, and that parents (or others transporting three or more young children) were faced with problems in relation to accommodating three restraints in the rear seats of their cars. This was particularly evident in the comments from childcare/family daycare interviewees.

The issue seen as being the one of most concern was that of parent confusion and ensuing anxiety. While interviewees perceived the biggest concern for parents was having their children in the correct restraints, some interviewees mentioned that the move towards an age-based specification of the legislation appeared difficult for parents. Parents appeared to try to reconcile the restraint manufacturers' height and weight specifications for different restraint types as well as age and became confused about what they were actually required to do or which restraint type to use. This seemed to be especially the case for transition points such as rear-facing to forward-facing travel and childseat to booster transitions or where parents perceived a transition even if there isn't one under the legislation (e.g. when a child reaches 14kgs and thus is at the minimum weight specification for a booster seat but is not yet 4 years old). As mentioned above, interviewees expressed views that this confusion tended to be exacerbated by the conflicting information available at the time.

Specialist retailers had a lot to say about the more negative aspects of the effect of the legislation on some parents. While they thought that most parents had been positively disposed towards the changes in the legislation, a vocal minority of parents were not. These parents apparently harbored sentiments that the legislation is over regulation and an example of 'nanny state' tendencies. There were comments from retailers that some parents appeared to believe (erroneously) that Australian restraints are less effective than overseas restraints because the Isofix system is not used here. Retailers also mentioned that some parents express skepticism that restraints actually do what they are meant to because their children are able to (and apparently do) unfasten them. This creates resentment about having to spend the money on the restraint. The problem of getting older children (5-7 year olds) to use booster seats also appears to be a concern that parents voice to retailers. One retailer expressed the view that department store retailers should not be permitted to sell restraints as they don't provide adequate guidance to parents about selection and use, and in some cases provide misleading or incorrect information. This can then create problems for specialist retailers when the parent approaches them to carry out an installation, as they become the one who has to break the bad news to the parent that he/she has been sold a restraint that may not be the correct one for the child.

The question on fitting errors, although designed to try to find out what types of mistakes parents make in installing restraints themselves, was not actually very useful as many of the interviewees were not really confident that their answers would be reliable. However, fitters mentioned that strap locations and adapting straps for different heights, twisted harnesses, using incorrect anchors, doubling up on anchor points were all common errors. An early transition to forward-facing mode for babies was also given as an error fitters encountered, which might potentially be a common one.

6.3.3 Satisfaction with the implementation of the legislation

In order to gain an understanding of stakeholder perceptions of the extent to which they had been included in the processes leading up to the changes, participants were asked to provide ratings of their satisfaction (on a 5 point scale where 1= "*Very dissatisfied*" through to 5 = "*Very satisfied*") with aspects of the consultation and implementation of the legislation. These aspects were the level of prior community involvement or consultation sought before the legislation was introduced and the level of prior advertising and promotion used to inform the public and stakeholders and raise awareness that the legislation was coming into force.

In addition, participants were asked to rate their overall satisfaction with the safety benefits of the new legislation.

As can be seen in **Table 32**, overall the interviewees who responded to this question (n = 26) reported a very high level of satisfaction with the safety benefits of the legislation, with all but one interviewee giving a rating of ‘satisfied’ or ‘very satisfied’. Satisfaction ratings were more varied regarding prior community consultation before the legislation was introduced, with only half of interviewees reporting they were satisfied (12 interviewees) and a large proportion (11 interviewees) providing either a neutral answer or not wishing to give an answer to this question. While satisfaction with the level of prior public advertising and promotion conducted to raise parents’ awareness before the legislation was at about the same level as for community consultation, this aspect of the implementation attracted the highest levels of dissatisfaction, with 10 interviewees indicating that they were dissatisfied. Several interviewees commented that the methods chosen (print and radio) had not been sufficient and much more publicity had been needed. There were also comments that although there had been attention to publicising and informing parents prior to the enactment of the legislation, there were few resources devoted to maintaining this after the legislation had changed and perhaps this would have been useful in reaching a wider parent audience.

Table 32. Stakeholder (n = 26) ratings of satisfaction with aspects of the implementation of the legislation

<i>Stakeholder overall satisfaction with...</i>	Satisfied (rating 4 or 5)	Dissatisfied (rating 1 or 2)	Neither satisfied nor dissatisfied (rating 3)	Did not respond
The safety benefits of the new legislation	25 (96.1%)	0	1 (3.9%)	0
The level of prior community involvement or consultation sought	12 (46.2%)	3 (11.5%)	7 (26.9%)	4 (15.4%)
The level of prior advertising and promotion	12 (46.2%)	10 (38.5%)	3 (11.5%)	1 (3.9%)

6.3.4 Perceptions of the effectiveness of the legislation on parental awareness and behaviour in relation to restraints

Interview participants were asked to provide a rating of how effective they thought the new legislation had been in raising parental awareness of the importance of appropriate restraint choice, the role of age/size in choosing an appropriate restraint and the need for children to keep using a dedicated restraint until at least 7 years old. In addition, there were two items that sought overall perceptions of the effectiveness of the legislation (in raising parental awareness of the importance of child restraints generally and in making parents more child safety conscious generally). A summary of the items and responses is displayed in **Table 33**. Ratings were on a 5-point scale, where 1= “Very ineffective” through to 5 = “Very effective”.

As can be seen in **Table 33**, overall the interviewees perceived the legislation to be effective in a number of areas. In particular, it was perceived that the legislation was effective in

raising parental awareness about the importance of child restraint use generally (17/25 interviewees rating this as 'effective' or 'very effective'), that children need to be in a dedicated restraint until at least 7 years old (17/24 interviewees rating this as "effective" or "very effective"), and to a lesser extent, in making parents more child safety conscious generally (13/23 rating this as "effective" or "very effective").

Table 33. Ratings of the effectiveness of the legislation on parental awareness and behaviour in relation to restraints

Items	Interviewee ratings			n
	'Effective' (rating 4 or 5)	'Ineffective' (rating 1 or 2)	Neither effective nor ineffective (rating 3)	
How effective do you think the legislation was in.....				
Raising parents awareness about the importance of child restraint use generally	17 (68.0%)	2 (18.0%)	6 (24.0%)	25
Raising parent awareness of the importance of appropriate restraint choice	12 (52.2%)	2 (8.8%)	9 (39.1%)	23
Raising parent awareness of the role of child age/size in appropriate restraint choice	7 (30.4%)	2 (8.7%)	14 (60.9%)	23
Raising parent awareness that children need to be in a dedicated restraint until at least 7 years old	17 (70.8%)	3 (12.5%)	4 (16.7%)	24
Making parents more child safety conscious generally	13 (54.2%)	2 (11.0%)	8 (34.8%)	23

6.4 DISCUSSION

Overall it seems that the main effect of the legislation on stakeholder organisations was to temporarily increase the volume of enquiries from parents in relation to the changes in the legislation. It should be noted that organisations that are directly responsible for carrying child passengers were affected more than others, and the impact on them involved direct as well as indirect financial costs associated with ensuring that they had sufficient numbers of restraints for all the children they needed to transport. Specialist retailers also appeared to have experienced a greater level of complaints from parents. Presumably this was at least partly because some customers now purchasing restraints are doing so in order to comply with the legislation rather than out of a genuine belief in the safety benefits.

While all the organisational representatives we spoke to thought that the updating of the legislation had brought about positive changes in parental awareness about proper restraint use for children and improved outcomes for children, they appeared concerned about the negative effects on subgroups of parents such as those with three or more children to transport, and those with limited incomes. Interviewees also noted that the level of confusion for parents about which restraint is the most appropriate to use, something that the move to an age-based criterion within the legislation was supposed to alleviate, was high for some parents. This was likely exacerbated by misinformation in the media as well as by

contradictions between information sources at the time the legislation was announced and also when it came into force. Indeed it was the level of advertising and promotion of the nature of the changes to the legislation prior to implementation that drew the most negative comment and greatest level of dissatisfaction among interviewees.

Two recommendations appear relevant in relation to the results of this part of the research. The first of these is that information given to parents about which restraints to choose for children should emphasise the age-based criterion and remove references to weight-based criteria since this appears to be confusing for parents and has the dual risks of encouraging parental mistrust of the information they receive as well as increasing the likelihood that parents will transition children too soon (that is, according to the minimum weight for the larger restraint rather than the maximum weight for the smaller one as these weight bands overlap). This is particularly critical and appears to be most confusing in relation to the transition to or from forward facing restraints. Though the Standard has always given the weight range for such restraints as 8-18kgs, they have always been safe to use with children heavier than 18kgs. This is because the weight of the dummy specified for the testing regime for forward-facing restraints, a P6 22kg dummy (equivalent to a 50th percentile 6 year old child) is much higher than the 18kg limit permitted on the labelling of those restraints (Mike Lumley, personal communication, November, 2011). Thus all forward facing restraints that comply with the earlier AS/NZS: 1991, 2000 and 2004 were tested with 22kg dummies and capable of safely restraining a much heavier child. This same-sized dummy is the one required under the new Standard (AS/NZS1754:2010).

The second recommendation is that a tightening of where/how restraints are sold be explored. Currently there is no obligation for retailers to provide any guidance in appropriate restraint selection nor for staff to be trained in appropriate selection or correct installation. This means that larger retailers can sell, and parents can purchase, inappropriate and unsuitable restraints, and examples were cited in the interviews (and anecdotes abound). A requirement for retailers to either have appropriately trained staff, or minimum standards of guidance available might alleviate this problem. One possibility would be to insist on better designed point of sale materials to guide parents in selecting a restraint and impose the obligation to display such materials on the retailer. Potential cost/affordability issues in relation to this would need to be explored in some depth.

In addition, it is anticipated that the recent changes to the Standard as in AS/NZS1754 2010 mean that restraints manufactured after March 2010 will have the required shoulder height markers to guide appropriate selection and this should help alleviate problems with appropriateness of the restraint for individual children. The revised Standard also has maximum seat width specification for booster seats (including the new Type F seats suited to older, heavier children 8-10 years and up to 36kgs) (Lumley, 2011) which will help address space problems for parents and drivers needing to fit 3 seats into the rear of vehicles.

7 CONCLUSIONS, RECOMMENDATIONS and LIMITATIONS

The separate results from each of the studies suggest an overall positive impact of the legislative changes on the safety of children in the target age range (0-7 years). In particular, the more objective measure of compliance levels (the observations) revealed greater proportions of children wearing the required restraint type for age than was evident in the previous (2005) observational study and a smaller proportion of children travelling in the front seats of vehicles. However, these results were at a modest level overall (10%) and they appear to be significantly diminished for Mackay, where the level of children observed as completely unrestrained was relatively high (7.8%). We do not have baseline/pre-legislation figures in relation to children's restraints in Mackay so it is impossible to tell whether the impact of the legislation has been more dilute there or whether the base level of appropriate restraint was substantially lower than that of urban locations in the first place.

Parents in all locations, Indigenous and non-Indigenous appear to think the new legislation is a positive move and they perceived the intention of the legislation as being to protect children or improve their safety. Almost all non-indigenous parents believed they had complied with the new legislation, and analysis of their reports of the restraints being used with their children suggests a high level of children were appropriately restrained for age. Indigenous parents in Woorabinda believed that the overall compliance within the community might be at about 50%. Non-Indigenous parents who responded to the items asking their views of the legislation gave high levels of agreement that the legislation was easy to understand, made it clear what they needed to use with their children and was effective in getting children into the appropriate restraints. However, Indigenous parents identified barriers that could be substantial influences on non-compliance (and therefore effectiveness) in some circumstances and these will need to be addressed if the legislation is to have maximum effect in all strata of the community.

Stakeholder organisations appeared largely unaffected by changes to the legislation beyond the immediate few months around the time of implementation. For most, the main effect was that parent enquiries increased, substantially for some organisations, and managing these presented short-term operational and logistical burdens. However, stakeholder organisations appear to deal with those parents most likely to be experiencing difficulty with the new legislation. There were also accounts of some very negative parent views especially from specialist retailers.

7.1 Recommendations

Recommendation 1: That further research be undertaken with rural/remote and regional parents to explore results obtained in this research, with a particular focus on parental beliefs and behaviours in relation to restraint use generally and child restraint use specifically. This research should aim to identify barriers to more consistent and appropriate use of child restraints for parents in these locations. In addition, such research should endeavour to identify effective interventions to address identified barriers.

Recommendation 2: That web-based information available to parents in relation to child restraints remove references to the weight-based criteria for restraint selection that was a

feature of the previous Standards as these may be confusing for parents and are inconsistent with the 2010 legislative emphasis on age as the primary criterion.

Recommendation 3: That a coordinated, multidisciplinary, long-term approach to the development and distribution of informational and educational materials on the age-appropriate restraints and criteria for transition to larger restraints which specifically target parents of children in the age range 1-4 be adopted. This could seek to involve all the relevant organisations in Queensland that have an interest in safer children's restraint, such as Queensland Health, TMR, RACQ, QAS, Kidsafe, QPS, QISU and other identified bodies. One possibility for the distribution of such materials would be as a brief intervention through health practitioners (eg. nurses or GPs) at the 12 months old triple antigen vaccination (measles, mumps, rubella "MMR"). Posters at health and childcare facilities might also be effective in this regard.

Recommendation 4: That key personnel in Indigenous communities be trained in the correct use and installation of restraints to ensure that this expertise is readily available to the community. It is recommended that the initial candidates for training should be those staff that deal regularly with mothers (clinic staff, child safety workers, daycare staff, etc.). There may even be potential to build restraint use education into health authority programs for new mothers. Potential sources of assistance could include the QAS and Kidsafe. Partnerships between organisations working with communities and QAS or Kidsafe to provide training of personnel could be explored in this respect.

Recommendation 5: That increasing the resources available to schemes such as the child restraint hire scheme in Woorabinda should be considered. This could take the form of providing more restraints for hire, extra personnel to assist with promoting its use, or duplicating the scheme in other locations/communities.

Recommendation 6: That sharing culturally-appropriate educational resources (like the RTA "Bring the Mob Home Safely" restraint promotional material) across jurisdictions should be considered. Permission to modify these for Queensland use could also be explored.

Recommendation 7: That restricting where/how child restraints are sold be explored. A requirement for retailers to either have appropriately trained staff, or minimum standards of guidance available might be sought as part of requirements for retailers of restraints. Alternatively, minimum requirements (e.g. size, type and detail provided, level of prominence of the display) in point of sale display materials that guide parents in selecting a restraint could be specified. Potential cost/affordability issues in relation to this would need to be explored in some depth.

7.2 Limitations of the study

The findings from this research should be viewed in light of the limitations of the various component studies. For the observational study, the methods used to collect the observations are an obvious limitation to this component. In particular, the type of travel represented by the sites chosen for the observations (schools and shopping precincts) may not be representative of other types of travel for children. It may also be that the nature of selection of the particular sites and their dependence on permission from shopping centres to conduct the parent interview study may have introduced bias into the findings. So too the physical difficulties in being able to see the restraints children were using represents a limitation. A more careful and expert inspection of children's restraints and their actual use would have been desirable, though clearly much more expensive and difficult to undertake. More careful inspection would also allow conclusions about whether restraints are being used in a safe manner, an issue that has been highlighted as critical in other studies.

The self-selection and self-report nature of the interview-based study of non-Indigenous parents is another limitation to be borne in mind when interpreting the results. The absence of parents who admitted to travelling with children who were unrestrained suggests that the interviewed parents are more representative of compliant parents than of parents with the highest risk restraint practices. As these higher-risk parents are of particular interest to this kind of study, it is unfortunate that the method did not capture them.

As with all focus group-based studies, the information from the study of Indigenous parents may not be representative of other parents. However, the findings in this component of the research were exploratory and the themes identified bore a strong resemblance to themes from similar studies of non-Indigenous parents.

APPENDIX A

INTERCEPT INTERVIEW QUESTIONS: Child Safety in Cars

Intro blurb including name and purpose of study:

- Name, from QUT, interested in answering some brief questions about child restraints for a study we're conducting
- Evaluating the impact of the new child restraint laws in QLD, questions take 7-8 minutes, anonymous/confidential responses

Eligibility questions: Just to be sure that we are talking to the right group of people today, could you tell me please:

- a) do you live in [name of city]?
YES (continue) NO (thank and terminate)
- b) do you have children aged under 8 years living with you at least 1 day per week?
YES (continue) NO (thank and terminate)
- c) do you drive your children in a passenger car at least once per week?
YES (continue) NO (thank and terminate)

1. About how often would you be the person who drives your children in the car?
CARD A 1 2 3 4 5
2. About how many trips would you drive your children in a typical week?
CARD B 1 2 3
[count all trips even if not all children go on each trip]
3. How many children do you have under the age of 8? Could you tell me the ages of each of the children who live with you at least 1 day per week? (whole yrs; include months for children under 2 years)

Child 1 age:	Child 2 age:	Child 3 age:	Child 4 age:
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B: CARD C - pictures of restraint types:

Thinking of your [age Child 1] year old what type of restraint does he/she usually wear?

- 1 (cap) 2 (FF) 3 (booster) 4 (b. cush) 5 (harness)
6 (adult) 7 (don't know) 8 (none)

Thinking of your [age Child 2] year old what type of restraint does he/she usually wear?

- 1 (cap) 2 (FF) 3 (booster) 4 (b. cush) 5 (harness)
6 (adult) 7 (don't know) 8 (none)

And what does your [Child 3 age] year old usually wear?

- 1 (cap) 2 (FF) 3 (booster) 4 (b. cush) 5 (harness)
6 (adult) 7 (don't know) 8 (none)

And what does your [Child 4 age] year old usually wear?

- 1 (cap) 2 (FF) 3 (booster) 4 (b. cush) 5 (harness)
6 (adult) 7 (don't know) 8 (none)

C: One of the issues we are interested in is who installs the restraint. [Interviewer: ask for each restraint type from 3B]

Thinking back, can you tell me who installed the [restraint type used by youngest child 3B]

CARD D

1 (self) 2 (partner) 3 (friend) 4 (professional)
 5 (Don't know) 6 (Other) (specify).....

What about the [restraint type used by next oldest child]?

1 (self) 2 (partner) 3 (friend) 4 (professional)
 5 (Don't know) 6 (Other) (specify).....

And the [restraint type used by next oldest child]?

1 (self) 2 (partner) 3 (friend) 4 (professional)
 5 (Don't know) 6 (Other) (specify).....

And the [restraint type used by next oldest child]?

1 (self) 2 (partner) 3 (friend) 4 (professional)
 5 (Don't know) 6 (Other) (specify).....

GO TO Q.5 IF 'PROFESSIONAL' ALREADY INDICATED above; otherwise ask Q.4

4. Have you EVER used a professional fitter to install or fit ANY child restraint for ANY of your children? (circle)
YES (continue) **NO** (go to 5) **Don't know** (go to 5)

If YES: what type of restraint was it?

Type of restraint.....Who fitted it?.....approximately how long ago?.....[year or no. of years ago]

Was there another restraint you had professionally installed/fitted?

Type of restraint.....Who fitted it?.....approximately how long ago?.....[year or no. of years ago]

Any others?

Type of restraint.....Who fitted it?.....approximately how long ago?.....[year or no. of years ago]

5. Are you aware that the Qld law about how to restrain children in cars was changed in Queensland in March 2010?

YES NO don't know/not sure

If YES continue If NO/don't know - Go to demographics

6. Where did you find out about the changes? Note Key words verbatim

7. What would you say were the main changes that were made? Note key words verbatim

8. What do you think was the main purpose for changing them (free response) Note key words verbatim

9. What (if anything) do you do differently when restraining your child(ren) as a result of the changes in the law?

Circle or note key words verbatim

Nothing/no change	Bought new restraints		
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10. We are interested in parents' experiences of **using restraints. CARD E**

In your opinion, how easy or hard is it for you to use the required restraint with your [Child 1 age] year old?

- (1) very easy----- (2) easy----- (3) hard----- (4) very hard
IF hard/very hard: What would you say are the MAIN things that make using that restraint hard/very hard? **Allow up to 3 reasons in order of importance**

How easy or hard is it for you to use the required restraint with your [Child 2 age] year old?

- (1) very easy----- (2) easy----- (3) hard----- (4) very hard
IF hard/very hard: What the MAIN things that make it hard/very hard?

And for your [Child 3 age] year old?

- (1) very easy----- (2) easy----- (3) hard----- (4) very hard
IF hard/very hard: What the MAIN things that make it hard/very hard?

And for your [Child 4 age] year old:

- (1) very easy----- (2) easy----- (3) hard----- (4) very hard
IF hard/very hard: What the MAIN things that make it hard/very hard?

Read out: To what extent do you agree or disagree with the following statement(s). CARD F Strongly disagree to Strongly agree)	
11. Most children were already using the right sized restraints so there was no need to change the law 1 2 3 4 5	17. The new law is effective at getting children into the right restraints 1 2 3 4 5
12. The new law is easy to understand 1 2 3 4 5	18. Overall, I think we needed the new law 1 2 3 4 5
13. The new law is too hard for me to comply with 1 2 3 4 5	19. It has been expensive for me to comply with the new law 1 2 3 4 5
14. The new law is too complicated 1 2 3 4 5	20. A childseat is safer than a booster seat for children 2-4 yrs 1 2 3 4 5
15. The new law makes it clear what I need to use with my children 1 2 3 4 5	21. Children aged 5-7 years are just as safe in a seat belt as they are in a booster seat 1 2 3 4 5
16. I have done what I need to do in order to comply with the new law 1 2 3 4 5	

22. For you, which of the following would be your MOST preferred source to obtain information about the changes in the restraint laws? **CARD G**

- (1) DTMR (2) Motor orgs (3) Childcare orgs (4) Friends/family
 (5) Health professionals (6) Restraint retailers (7) Kidsafe
 (8) Specialised website Other

DEMOG: Finally some questions about you for statistical purposes. These will not be used to identify you in any way

[record without asking] (circle)	Male	
Female		
Age Bracket (CARD H) : 1 2 3 4 5 6 7	Occupation (CARD J) : 1 2 3 4 5 6 7	
Highest education (CARD I) : 1 2 3 4 5 6	Combined Family Income (CARD K) : 1 2 3	

APPENDIX B

LIST OF PARTICIPANT ORGANISATIONS FOR THE STAKEHOLDER INTERVIEWS (where permission to identify the organisation was granted)

- ABC Childcare Centre, Coorparoo North
- Acacia Ridge YMCA Family Daycare
- Algester World of Learning childcare centre
- Brisbane Family Daycare
- Bubs Baby Kawana
- Bundaberg Family Daycare
- Claire's Family Daycare, Camira
- Diane's Family Daycare, Forest Lake
- Department of Main Roads and Transport (TMR)
- Gympie Family Daycare
- Kidsafe, Queensland
- KCF Rallysport
- Mobile Babyseat Fittings
- Queensland Ambulance Service (QAS)
- Queensland Injury Surveillance Unit (QISU)
- Royal Automobile Club, Queensland (RACQ)

APPENDIX C

SCHEDULE OF QUESTIONS FOR STAKEHOLDER INTERVIEWS

1. How much of your day to day business involves dealing with issues related to children's restraint?
2. What (if any) changes have occurred to this with the changes in the legislation?
3. What (if any) issues has this raised for you/your organisation as a result?
4. How have you/the organisation attempted to address these?
5. In your/your organisation's experience, what issues appear relevant to parents in relation to the either child restraints generally or the new legislation in particular?
6. What observations have organisational staff made in relation to restraint fitting errors by parents?
7. In relation to the new legislation, what questions do parents appear to ask most frequently?
What areas/issues appear to cause the most concern for parents?
What areas/issues appear to cause the most confusion for parents?
8. Overall, what impact do you think the new legislation has had on parents?
9. Overall, how would you rate your satisfaction with the following?

Use a 5 point scale 1 = Very dissatisfied, 2 = Dissatisfied, 3 = Neither satisfied nor dissatisfied, 4 = Satisfied, 5 = Very satisfied NA = no opinion

- The safety benefits of the new legislation
 - The level of prior community involvement or consultation sought before the legislation was introduced
 - The level of prior advertising and promotion used to inform the public and stakeholders and raise awareness that the legislation was coming into force
10. Using a 5 point scale, overall, how effective do you think the new legislation has been in:
 - Raising parents awareness about the importance of child restraint use *generally*
 - Raising parent awareness of the importance of appropriate restraint choice
 - Raising parent awareness of the role of child age/size in appropriate restraint choice
 - Raising parents awareness that children need to be in a dedicated restraint until at least 7 years old
 - Encouraging parents to seek professional advice in the selection of an appropriate restraint
 - Encouraging parents to seek professional advice about fitting/installing child restraints
 - Encouraging better fitting/installation of restraints
 - Making parents more child safety conscious *generally*

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