



Barriers to correct child restraint use: A qualitative study of child restraint users and their needs



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ABSTRACT

Motor vehicle crashes are a major cause of death and injury to children worldwide. Although risk of injury to child passengers can be reduced by using a child restraint, most restraints are incorrectly used. This greatly reduces the restraints' protective potential; however there is limited research on drivers of correct child restraint use. The aim of this study was to explore perceived barriers and motivators of correct child restraint use in experienced child restraint users, to inform interventions to promote correct use. Motivations and risk perceptions concerning incorrect child restraint use among high and low socioeconomic populations and culturally and linguistically diverse (CALD) child restraint users in Sydney, Australia were qualitatively examined. Six focus groups (N = 44 participants) were facilitated using a semi-structured discussion guide. Transcriptions were deductively analysed using QSR NVivo11 software and the COM-B model of behaviour. Common perceived barriers to correct restraint use were: (a) difficulty interpreting instructions and labels, particularly among CALD participants; (b) remembering and attending to correct use information; (c) lack of information and behavioural feedback on how to correctly install and use a child restraint; and (d) low confidence in ability to install and use a child restraint correctly. The results indicate current child restraint product information is poorly understood, particularly among those whose first language is not English. Interventions to increase correct child restraint use should address access to correct use information, capability to understand and use these, and the influence of motivation, memory and attention in the process.

1. Introduction

Despite legislation mandating child restraint use for child passengers in most high income countries (WHO, 2015), and increasing adoption of legislation globally in response to the World Health Organisation road safety campaign in 2004 (Nazif-Muñoz, 2015), traffic injuries remain a leading cause of death for children, and child passengers account for up to half of these deaths (Peden et al., 2008). Using age-appropriate restraints reduces the risk of death and injury (Elliott et al., 2006). However for optimal crash protection restraints must be used correctly (Brown et al., 2006), as misuse significantly increases the risk of injury during a crash (Bilston et al., 2007). Correct use of child restraints requires restraints to be installed and the child secured as intended by the manufacturer.

Legislation requiring use of age-appropriate child restraints does not necessarily prevent errors in the way restraints are used (Brown et al., 2013b). Recent estimates at discharge from a maternity hospital in the United States saw up to 95% of child restraints being used incorrectly (Hoffman et al., 2016). Incorrect use of child restraints is also widespread in Australia (Koppel et al., 2013).

It is common to see variation in rates of misuse with socioeconomic status (Bilston et al., 2011), with higher rates of errors in culturally and linguistically diverse (CALD) populations (Bilston et al., 2011). Educational interventions for child passenger safety should be developed in accordance with the needs and motivations of parents/carers, regardless of cultural and linguistic background (Ishikawa et al., 2014; Weaver et al., 2013). For this reason, involving users in the design and implementation of interventions is critical. This 'consumer-centered'

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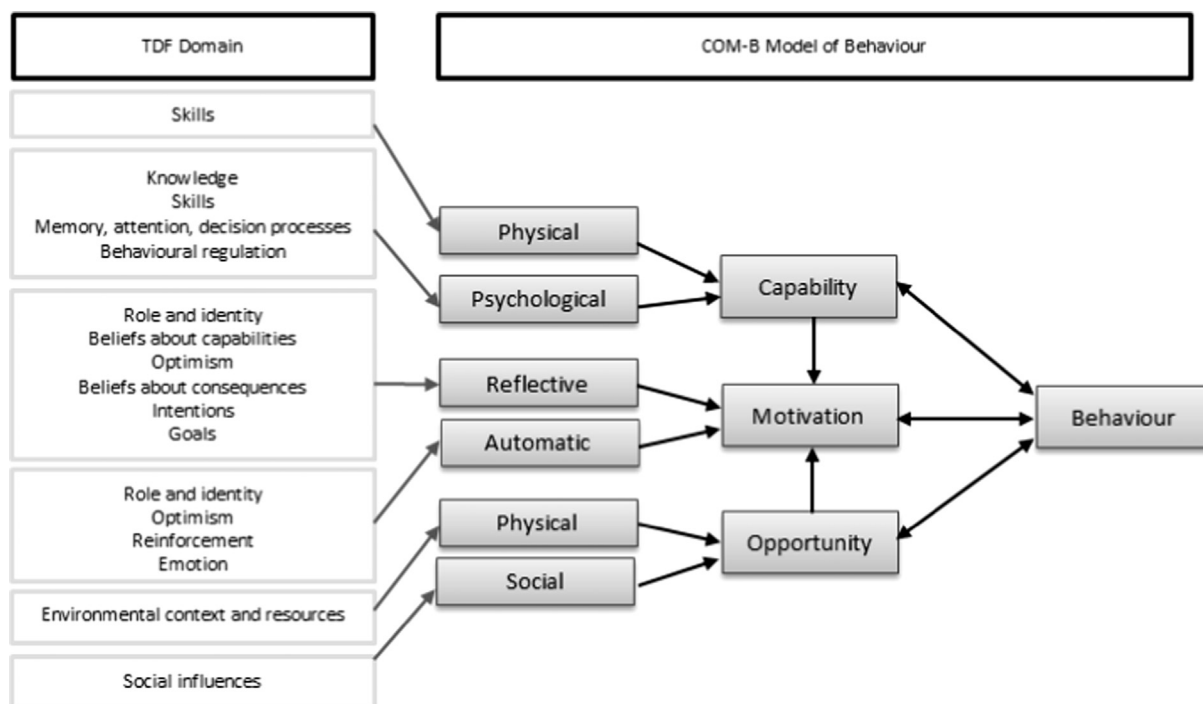


Fig. 1. COM-B Model of Behaviour with Theoretical Domains Framework (TDF) Domains (Diagram constructed based on detail provided in Michie et al., 2011).

approach is well documented in other areas of health, e.g. involving users in the design process for developing patient information materials that are more ‘relevant, readable, and understandable to patients’ (Pg 2, Nilsen et al., 2006)

Information supplied with child restraints at the point of sale is a potential intervention delivery method that can reach all child restraint users. To maximize the potential use of this information as an intervention to counter errors in use, there is therefore a need to provide mechanisms for incorporating consumer input into its design. Furthermore, as this type of intervention targets behaviour change, there is a need to capture this input within a behaviour theory framework.

Michie et al. (2011) have developed the COM-B model (see Fig. 1) as a framework that allows behaviour change targets to be defined in terms of behavioural theory. The COM-B model outlines how a person’s behaviour (B) is a result of their capability (C), opportunity (O), and motivation (M) to perform the behaviour (Michie et al., 2011). While this type of model has never been previously used to explore the needs and motivations of parents/carers in developing educational interventions focused on child restraint use, this model intrinsically provides a useful framework for interpreting consumer input from a behavioural theory perspective.

We have some preliminary insights into capabilities, opportunities, and motivations experienced by child restraint users from the literature (Brown et al., 2013a; Simpson et al., 2002). However, there is insufficient research on these factors cross-culturally and across demographics. Previous research has assessed the impact of macro level factors such as legislation on the use of child restraints (Brubacher et al., 2016; Nazif-Muñoz et al., 2017) and speculated on the macro level barriers to using a child restraint system e.g. the influence of appropriate use legislation and public policy (Brown et al., 2013b). However, there is a need to identify the micro-level barriers and enablers of child restraint use, i.e. at the level of the individual to guide future research on promoting correct use and preventing misuse. We aim to use the COM-B model of behaviour to interpret consumer needs for information supplied with child restraints. This will ultimately provide insights to guide development of interventions targeting reductions in errors in use of child restraints. Specifically we aim to

explore how child restraint use might function as part of an individual’s capability, opportunity, and motivation and how this varies across high education and income (high SES), low education and income (low SES), and culturally and linguistically diverse (CALD) users.

2. Method

The COM-B model of behaviour was used to deductively analyze discussions from six focus groups conducted in Sydney, Australia. The focus group method was chosen for the study because group interaction was deemed valuable in providing new insights from shared experiences (Ivanoff and Hultberg, 2006) and it has been used previously in research on child restraints with culturally and linguistically diverse participants (Brown et al., 2013a).

We sampled three groups of child restraint system (CRS) users with the following criteria:

- Participants in high income and high education brackets (high SES)
- Participants in lower income and lower education brackets (low SES) and
- Participants from a culturally and linguistically diverse background (CALD)

2.1. Sample

High SES participants were recruited through university and research organisation email distribution channels. Community playgroups specifically for English as Second Language residents in Southeastern Sydney, and community playgroups in areas of socioeconomic disadvantage (low SES) as indicated by the Australian Government Socioeconomic Index for Areas (Australian Bureau of Statistics, 2013) were used to recruit CALD and low SES participants. This recruitment strategy also maintained homogeneity within groups, which has been noted previously as important for participant comfort and free discussion (Brown et al., 2013a).

Based on our previous experience using a similar deductive approach with a behaviour theory framework (Brown et al., 2013a) we sought to recruit participants for two focus groups within each

sociodemographic group. To ensure group size was small enough to allow participation by all group members and adequate within group diversity, a target of 5–10 members per group was set prior to recruitment.

All parents or carers over 18 years and conversant in English were eligible. We conducted two groups each of high SES participants, CALD participants, and low SES participants. All participants had some previous experience in installing a child restraint system or securing a child into a restraint. Participants were reimbursed AUD\$25.00 for their travel costs.

2.2. Procedure

All participants gave written consent and completed a questionnaire that collected demographic information and experience with child restraint use.

Two researchers attended each group; one facilitated discussions using a semi-structured discussion guide and the other took notes. The discussion guide was formulated on a review of factors previously reported to be associated with errors in child restraint use (Liu et al., 2016; Simpson et al., 2002; Snowdon et al., 2008; Weaver et al., 2013), and was guided by the COM-B model of behaviour (Michie et al., 2011). The discussion guide prompted child restraint users to identify physical and psychological capabilities that prevent correct child restraint use, and social or physical opportunities/circumstances that might hinder use. For example, this was achieved by asking participants to think about their experiences using and installing child restraints and prompting discussion about what factors might underlay any difficulties they raised. Other discussion prompts explored motivations to use child restraints correctly, understanding of the importance of correct use, and use of child restraint information. Questions used as these prompts included “How do you know if a child restraint is used correctly”, “What do you think might happen if not used correctly”, and “can you think of a situation where a child restraint would not be used”.

All groups were audiotaped, transcribed, and de-identified in accordance with University of New South Wales Human Research Ethics Committee approved protocol (HC15547).

2.3. Data analysis

Of the six audio-recordings, only four were transcribed verbatim due to audio quality of two recordings. For those with poor audio quality (one low SES and one CALD group), detailed researcher notes of discussion content were used instead of transcripts. Notes were taken in all focus groups. Retrospectively, authors conducted a small comparison between notes and transcriptions of other groups and did not find any differences in the overall thematic content recorded in both media. We followed the deductive approach to content analysis as outlined by Elo and Kyngas (2007) and the COM-B Model as framework for this analysis. Table 1 presents the COM-B model definitions and the a priori classification of concepts related to correct use of child restraints mapped onto the elements of the COM-B model. These formed the categories used to code the data in the analysis, or categorization matrix as described by Elo and Kyngas (2007). Following the next step in a deductive content analysis as outlined by Elo and Kyngas (2007), transcripts and discussion notes were then coded according to these categories independently by two researchers using QSR International's NVivo 11 Software. This included any mention of any issue relevant to these pre-defined categories. Where any consistencies between researchers occurred, these were discussed between the researchers until consensus was reached. We summarized data numerically by counting the frequency as ‘1’ every time the issue was discussed, so frequency reflects the number of times an issue was raised. Note this does not capture the number of times the issue was mentioned by individual participants, rather it reflects the weight given to this issue throughout the discussions across the groups.

3. Results

Of the 44 participants in the six focus groups ($n = 8$ high SES; $n = 12$ CALD; $n = 24$ low SES), 95% were female. Groups consisted of four to 12 participants. All were parents or grandparents and had some experience using child restraints.

Table 1 demonstrates the classification of emerging codes from the focus groups within the framework of the COM-B model of behaviour and Theoretical Domains Framework (TDF). Results are presented in detail within this framework below. This includes exemplary quotes from participants within each category.

3.1. Capability

3.1.1. Physical

Fig. 2 shows the differences across groups in perceived physical capability to use child restraints correctly. The high SES group cited difficulties using their child restraints ($n = 15$) more often than CALD ($n = 3$) or low SES participants ($n = 1$). Across all groups, the most commonly cited problems related to untwisting harness straps on the child restraint system ($n = 9$), followed by attaching top tethers to anchor points ($n = 3$), and adjusting recline on the child restraint ($n = 1$). Only one high SES and two low SES participants said they could use the restraint without needing assistance.

Fig. 3 outlines the psychological capability barriers identified as inhibiting correct restraint use.

There was common belief across groups that ‘correct use’ meant using the restraint in the right way, but there was little elaboration of what the right way was, even when prompted. Across all groups, there were only 14 instances of participants ($n = 9$; CALD = 3; Low SES = 2) demonstrating specific knowledge of correct restraint use (e.g., need for belt to be tight, straps untwisted, etc.)

The CALD groups most frequently referenced a lack of the ability to read ($n = 3$), understand ($n = 4$), and apply ($n = 6$) information on correct use as impacting ability to use product information.

“Because it’s so hard for me, I know more how to talk than to write or read so that’s why, for me, it’s a little bit more hard to understand.”

Understanding and interpreting product information was the most frequently cited difficulty for high SES ($n = 5$) and low SES ($n = 3$) groups. High SES group were the most often to report that memory inhibited correct use ($n = 4$), while attention issues were raised more often among the low SES groups as they reported they were often ‘distracted’.

3.2. Opportunity

3.2.1. Physical

Fig. 4 outlines the physical opportunity barriers identified as inhibiting correct restraint use.

Two physical barriers cited as likely to result in misuse are when another person installs or uses the restraint ($n = 7$) and having multiple children and/or multiple cars in the family ($n = 9$). Specific car (e.g., no anchor point) and child restraint features were also linked to misuse ($n = 6$), for example:

“...it is the way the car seat is made and the seatbelt – to pass the seatbelt it was so hard.”

Three participants across high and low SES groups noted they did not have access to product information (material resources required):

“A lot of the time we get a lot of passed down goods from our friends and the information... they’ve probably lost it.”

And even when users have the original product information, lack of information and lack of feedback on correct use is the most common cited barrier to correct use ($n = 17$), particularly in high SES groups

Table 1
Classification of codes according to the COM-B Model of Behaviour and the Theoretical Domains Framework (TDF).

COM-B Model	Definition	TDF Domain	TDF Domain definition and constructs	Classification of group codes
Capability Physical	Physical capacity (i.e., skill) to engage in the behaviour (Michie et al., 2011)	Skills	Definition: An ability or proficiency acquired through practice.	<p>Competence/skill: Difficulties when using the child restraint that are under user control (“... the problem is finding the anchor”)</p> <p>Knowledge: Knowledge of correct use (i.e., cites best practice restraint use)</p> <p>Competence/skill: Ability to read, interpret, and apply product information (“It’s not like I don’t understand what they said, but ... the practical ... is more difficult”)</p> <p>Memory: Remembering to use correctly (“I’ve forgotten to tighten the strap...”)</p> <p>Attention: Attention for correct use (“...where you put them in, distracted by the other child”)</p>
	Psychological capacity (i.e., knowledge) to engage in the behaviour (Michie et al., 2011)	Knowledge	Definition: An awareness of the existence of something	
		Skills	Definition: An ability or proficiency acquired through practice.	
		Memory, attention, and decision processes	Definition: The ability to retain information, focus selectively on aspects of the environment and choose between two or more alternatives.	
Opportunity Physical		Behavioural regulation	Definition: Anything aimed at managing or changing objectively observed or measured actions.	
	Environmental factors that lie outside the individual that prompt or promote the behaviour (Michie et al., 2011)	Environmental context and resources	Definition: Any circumstance of a person’s situation or environment that discourages or encourages the development of skills and abilities, independence, social competence, and adaptive behaviour.	
Social		Social influences	Definition: Those interpersonal processes that can cause individuals to change their thoughts, feelings, or behaviours	<p>Critical incidents: Other person installs restraint (“And someone else strapping them in, usually the grandparent, and you realise that they haven’t strapped them in at all”)Critical incidents: Situations that increase likelihood of misuse (e.g., carpooling)</p> <p>Barriers: Car features (“There was no anchor point”) and child restraint features (“It is the way the car seat is made – to pass the seatbelt...”)</p> <p>Resources: Non-availability of product information (“I tried finding the manufacturer video but I couldn’t find what I needed.”; “Because a lot of the time we get a lot of passed down goods from our friends and the information, they’ve probably lost it”)</p> <p>Resources: Lack of information (“Is it at the right tension? How do you know that?”)</p> <p>Resources: Access to other correct use information (“...I took it to a fitting station because it seemed to wobble”)</p> <p>Social norms: Background of user (“I come from Ecuador where there is no rule for car seats there ... I can hold her [in my arms] like when I’m on the airplane”; “Firstly we came from Iraq and it’s not a rule to put a car seat [in] for your kids”)</p> <p>Social comparisons: Cues to behaviour (“I have been in the car with my friends and the baby has their whole hands out”)</p> <p>Social support: Information from family and friends (“I think I went to seek approval. I also had that same thought, this seems a little bit wobbly, but I think my aunty or my mum had mentioned it and they said [it’s fine]”)</p>
	Social factors that lie outside the individual that prompt or promote the behaviour (Michie et al., 2011)			
Motivation Automatic		Social/Professional role and identity	Definition: A coherent set of behaviours and displayed personal qualities of an individual in a social or work setting	<p>Incentives: Incentives for correct use (“...vouchers for correct installation ... which is useful for our first one.”)</p> <p>Negative affect: Emotions associated with use (“It’s very frustrating”)</p>
	Unconscious brain processes (i.e., habit and emotion) that energise and direct behaviour (Michie et al., 2011)	Optimism	Definition: An acceptance that things will happen for the best or that desired goals will be attained	
		Reinforcement	Definition: Increasing the probability of a response by arranging a dependent relationship, or contingency, between the response and a given stimulus.	
		Emotion	Definition: A complex reaction pattern, involving experiential, behavioural, and physiological elements, by which the individual attempts to deal with a personally significant matter or event.	

(continued on next page)

Table 1 (continued)

COM-B Model	Definition	TDF Domain	TDF Domain definition and constructs	Classification of group codes
Reflective	Conscious brain processes (i.e., goals, decision-making) that energise and direct behaviour (Michie et al., 2011)	Social/Professional role and identity Beliefs about capabilities Optimism Beliefs about consequences	Definition: A coherent set of behaviours and displayed personal qualities of an individual in a social or work setting Definition: Acceptance of the truth, reality, or validity about an ability, talent, or facility that a person can put to constructive use Definition: An acceptance that things will happen for the best or that desired foals will be attained. Definition: Acceptance of the truth, reality, or validity about outcomes of a behaviour in a given situation	Self-confidence: Beliefs about capability to install and use (“I get my husband to do it because I’m so nervous doing it wrong”) Outcome expectancies: No risk perceptions (“It won’t have a major impact”), Outcome expectancies: Risk perceptions for the driver (“...and you see the kid’s out, you could also get a fright and that can cause an accident”) and child (“... in a major accident, that your child won’t be as safe as they ordinarily could be”) Consequences: Previous experience with MVC increases motivation for correct use (“Before (the accident) I did it because I had to but now I do it because really know that if I don’t there’ll be bad consequences”) Stability of intentions: Perceived time pressure leads to misuse (“... he knows it’s really important, it’s critical, but he just wants to get them in and go.”) Intention: Intention to enforce correct use: Child behaviour (“...but on longer trips, she really complains – she wants to get her arms out the top”) A Stability of intention: Parent-perceived child comfort (“My little girl complains – I know it’s about safety but on longer trips, she really complains – she wants to get her arms out the top”) Goals: Understands link between safety and correct use (“I know it’s about safety”)
		Intentions	Definition: A conscious decision to perform behaviour or a resolve to act in a certain way.	
		Goals	Definition: Mental representations of outcomes or end states that an individual wants to achieve.	

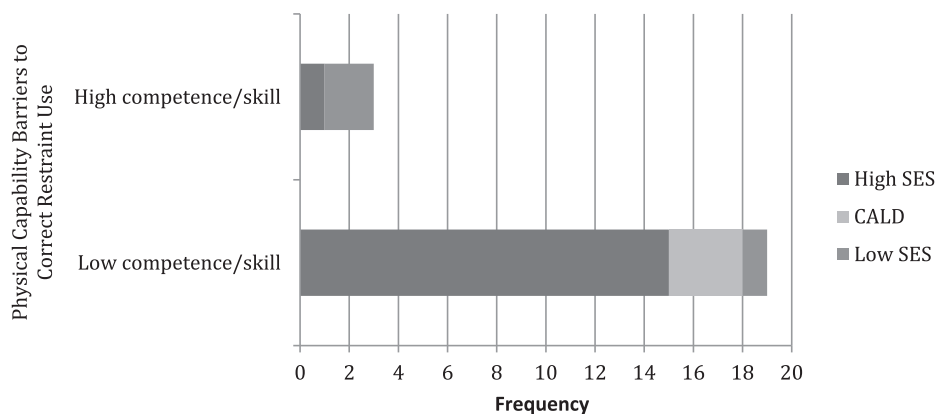


Fig. 2. Issues discussed across groups related to physical capability to use a restraint correctly. Frequency reflects the number of times an issue was raised, not the number of times the issue was mentioned by individual participants. 3.1.2. Psychological.

(n = 11). For example:

“How do I know what’s too tight and not too tight?”

High SES groups also frequently reported that access to additional correct use information (outside manufacturer’s product information) promotes correct use (n = 16). This was less often discussed in CALD (n = 0) and low SES (n = 5) groups.

3.2.2. Social

Social influences impacting restraint use include social norms, comparisons, and social support (see Fig. 5). Across all groups, participants rarely reported receiving correct use information from family and friends. CALD users noted social norms influence expectations for use (n = 4), whereas high SES users were more likely to reference others in their social network that encourage or demonstrate misuse (n = 5):

“I have been in the car with my friends and the baby has their whole hands out”

3.3. Motivation

3.3.1. Automatic

High SES groups used words like ‘hassle’, ‘annoying’, and ‘frustrating’ when describing installation or use (n = 13). Participants infrequently reported receiving incentives for correct use (i.e., vouchers for using a restraint fitting service; high SES; n = 2).

3.3.2. Reflective

Fig. 6 outlines the reflective motivational influences on correct restraint use.

Only two of 44 total participants expressed self-confidence to use child restraints correctly; participants across all groups generally held low beliefs in their ability to use child restraint correctly:

“I don’t know why I’m not confident. Maybe because it’s regarding the child’s safety”

Safety was the most commonly cited reason for using a restraint correctly, particularly in high SES groups (n = 5). Beliefs about consequences of misuse were grouped into ‘low’ and ‘adequate’. In the low risk group, two participants explicitly stated that they saw no consequence of misuse (e.g., *“It won’t have a major impact”*). However, group members disagreed when this arose in the discussion. For the adequate risk group, participants stated that misuse could lead to increased risk of having a crash (e.g., *“could also get a fright and that can cause an accident”*) or an increased risk to the child during a crash (e.g., *“...your child won’t be as safe”*).

Accurate risk perceptions, where participants linked the risk of injury to the risk of a crash, were heavily skewed to the high SES group (n = 16), but also in CALD discussions:

“For me it’s because there could be some accident.”

Three CALD participants also noted that previous experience in a crash motivates correct use, for example:

“Before I did it because I had to, but now I do it because really know that if I don’t there’ll be bad consequences.”

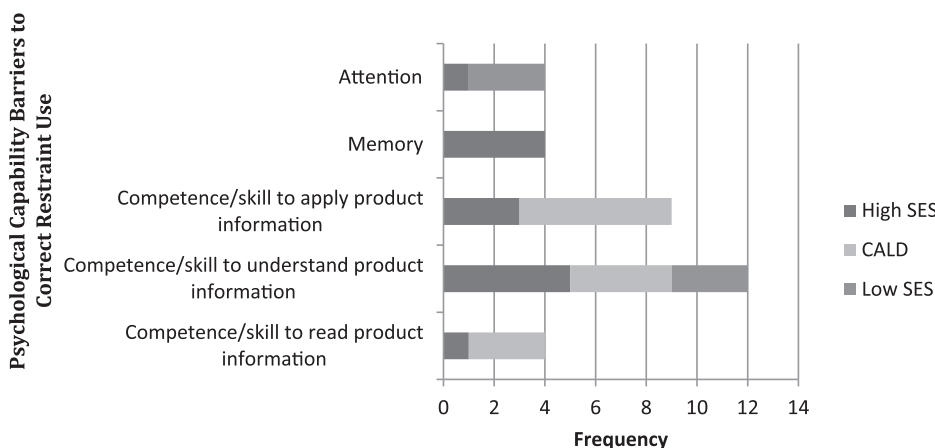


Fig. 3. Issues discussed across groups related to psychological capability to use a restraint correctly. Frequency reflects the number of times an issue was raised, not the number of times the issue was mentioned by individual participants.

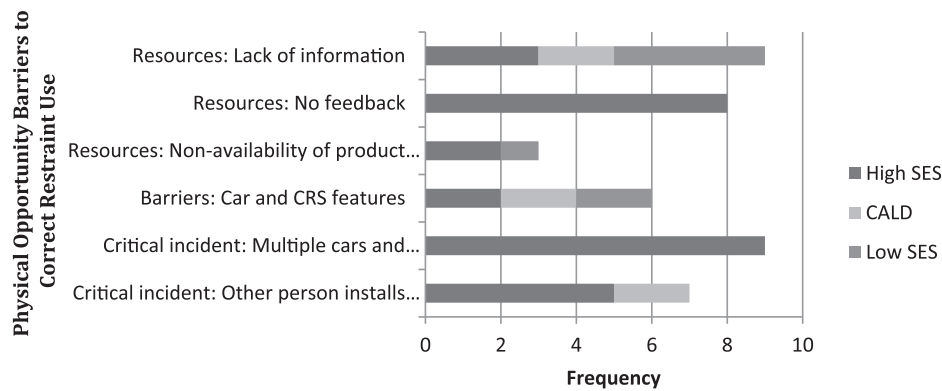


Fig. 4. Issues discussed across groups related to psychological opportunity to use a restraint correctly. Frequency reflects the number of times an issue was raised, not the number of times the issue was mentioned by individual participants.

When responding to a question in the discussion guide on what, if any, situations could influence their intention to use correctly, high SES groups often suggested time pressure ($n = 6$) as negatively influencing use, while CALD participants more often noted that child discomfort or misbehaviour may lead to misuse ($n = 7$):

“I know it’s about safety but on longer trips, she really complains – she wants to get her arms out the top.”

4. Discussion

Using the COM-B model, and TDF for capturing consumer input within a behavioural theory framework this study found the mostly commonly cited barriers to correct restraint use were:

1. Inability to accurately interpret child restraint use information, particularly among CALD participants, including limits on memory and attention (psychological capability)
2. Lack of information about how to correctly use a child restraint including a lack of feedback on behaviour (physical opportunity), and
3. Low confidence in ability to use a child restraint correctly, combined with low association between correct use and safety (reflective motivation)

Child restraint users perceive the information to be too difficult to understand and apply correctly. This is particularly true for participants whose first language is not English. Information provided with the restraint (instructions and labels) is often the most direct source of correct use information for child restraint users. Previous research indicates that child restraint product information is written at a comprehension

level too high for the general population (Wegner and Girasek, 2003). In this sample, however, even highly educated participants reported difficulty interpreting information. Our findings on the importance of feedback on behaviour to assist capability, supports previous work indicating that addressing capability by hands-on demonstration and feedback significantly increases correct use (Tessier, 2010). The challenge is to ensure all child restraint users, even those with low literacy levels, can fully comprehend information supplied with restraints, and to identify a mechanism for providing feedback within this information. There is also a need to identify how this information and its delivery might be used to aid memory and attention in day to day use of restraints. For example, using high risk information to heighten the likelihood information will be remembered.

In addition to a perceived lack of access to information about how to correctly use restraints identified in this study, physical opportunity to install a child restraint is also affected by CRS design features (Klinich et al., 2010). While this was not a focus of this current research, there were nine references to design features inhibiting correct use in this study. This included specific reference to difficulties achieving correct use due to design features of the restraint. For example, *“It is the way the car seat is made and the seatbelt, to pass the seatbelt it was so hard...”* and *“...[the] strapping at [the] front of restraint was too tight”*. is an area requiring further investigation, where consumer input may also prove invaluable.

Difficulty understanding information combined with poor availability of information within instructions led participants to seek information from other areas. While the most frequently discussed source for high SES was manufacturer’s instruction manuals, participants from CALD and low SES groups were most likely to look for correct use information online from a non-authorized channel (e.g., home videos on YouTube). This may be problematic due to the inability to control the quality of this information. Nevertheless, high levels of acceptance of

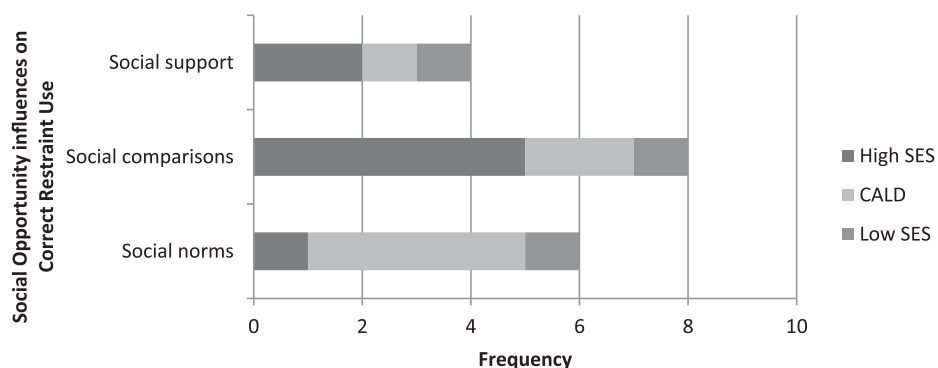


Fig. 5. Issues discussed across groups related to social opportunity to use a restraint correctly. Frequency reflects the number of times an issue was raised, not the number of times the issue was mentioned by individual participants.

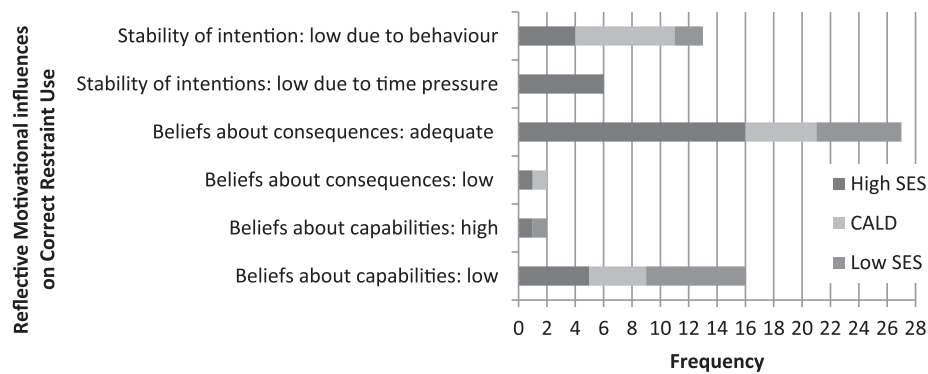


Fig. 6. Issues discussed across groups related to reflective motivation to use a restraint correctly. Frequency reflects the number of times an issue was raised, not the number of times the issue was mentioned by individual participants.

online tutorial materials among these sectors suggest this may be a potential target for future intervention.

This study also elicited some key insights into motivators of correct use, and demonstrated how capability and opportunity can interact to influence motivation. Participants were aware that errors in the use increased the risk of injury, but critically, perceived their capability to use their restraints correctly as low. Behavioural theories suggest that preventative health behaviours are most likely to occur when both risk perceptions and self-efficacy are high (Maloney et al., 2011; Rosenstock et al., 1988). Observations in this study therefore indicate that addressing self-efficacy by increasing the users' belief that they are able to use the restraint correctly may be key to optimizing motivation for correct use. To increase an individual's motivation to act, an intervention must not only raise awareness of and increase perceived risk but must also increase self-efficacy. Identifying ways to increase self-efficacy is therefore important.

Participants in this sample who were born outside of Australia noted that the differences in laws between their home country and Australia impact on how they view child safety. For example, the lack of child safety laws in some country might promote the belief that a child is safer travelling in their parents arms while in the car – an opinion brought up in the current sample.

Recent research found the same beliefs in new parents in China (Liu et al., 2016). But while highlighting legislation and policies on correct use might play a key role for CALD users, the high and low SES groups were more likely to rely on family and friend behaviour as cue to restraint use rather than law. Addressing both legal ramifications and social norms is therefore important in interventions designed to increase motivation for correct use.

In Australia, child restraint misuse is significantly more likely to occur in families from low income and non-English speaking background (Bilston et al., 2011; Keay et al., 2013). This is also true for child restraint use in other developed countries (e.g., Bachman et al., 2016). Almost 30% of Australia's estimated population are born overseas (Migration, Australia 15–15, 2016). Other countries with significant immigration populations are encouraged to take this study's findings into account when planning child restraint policies.

Using the COM-B model of behaviour to explore a behavioural change problem allows intervention components to be designed to target specific behavioural deficits (Michie et al., 2011). Given the commonly cited barriers identified in this study, future interventions should also focus on providing new sources of information that are easier for all users to understand, heighten memory and attention to correct use, and increase self-efficacy and risk perceptions relating to correct use. For example, improving the instructional information for a child restraint to aid understanding, memory, and attention could include the use of behavioural change techniques such as prompting correct use, providing cues to tightening straps, and the use of specific warnings for letting a child ride in an insecure restraint.

4.1. Limitations

Our sample was 95% female; therefore we had limited opportunity to explore the experience, views, perceptions and motivations among male users of child restraints. One element of why there was a high female response rate in this study could be an inadvertent characteristic of our target sample; we targeted experienced child restraint users, and a large proportion of the sample population were new mothers who are likely to be at home on maternity leave during this time and thus available to participate.

Our sample also included lower numbers of high SES participants, so our findings may therefore be less relevant for these groups and specific barriers among high SES users may have been missed. Further, due to background noise, we failed to transcribe two of six focus groups verbatim. While the comparison we made between the data collected in researcher notes and audio transcripts in those groups where both were available revealed good consistency in the overall thematic content, some detail may have been missed in those groups where only researcher notes were available. Therefore we believe including those groups without audio-recordings is justified as we believe we collected enough detail to capture consensus opinions, however the fact that this could not be ratified by transcripts is a limitation of this study.

Our use of the COM-B model for discussion guide development and classification matrix may have limited identification of concepts outside of this framework. However, use of this framework for deductive content analysis was relevant to our research aims as the next step is to create an intervention targeting these behavioural issues.

Finally, we cannot be sure that saturation of all key themes was reached. While themes were consistent across groups, new themes did arise in each group indicating there could be more to learn from this population and there may be further scope for investigation of the COM-B model of behaviour among child restraint users in different socioeconomic groups. However, the data collected was rich enough to provide insights across our pre-determined coding framework based on our classification matrix (Table 1) and we therefore believe the insight gained in this study will be useful to interventions development. Furthermore, the outcomes of this study can guide development of future self-report or observational surveys of the themes presented here.

4.2. Conclusion

This study aimed to use the COM-B model of behaviour to explore correct use of child restraints as part of an individual's capability, opportunity, and motivation and how this varies across different demographic groups. The results demonstrate that comprehension, memory and attention to instructions of how to use child restraints correctly affect users' perception of how to correctly use the restraints. Access to information, as well as mechanisms for providing feedback on correct use is important for addressing opportunity to correctly use restraints.

Increasing self-efficacy and risk perception is important for motivating correct use. The primary difference between groups appears to be social context that may impact motivation.

Insights gained in this work provide important understanding of how consumer needs for information supplied with child restraints might be interpreted to drive improvements in these materials to see reductions in errors in use of child restraints.

5. Contributorship

All authors have made a substantial contribution to a combination of: (a) the conception and design of the project, (b) the analysis and interpretation of research data, and (c) drafting significant parts of the work or critically revising it so as to contribute to the interpretation.

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Competing interests

None.

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Appendix A. Supplementary material

Supplementary data associated with this article can be found, in the online version, at <http://dx.doi.org/10.1016/j.ssci.2018.05.017>.

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