

# **PASSENGER INFLUENCES ON YOUNG DRIVER SAFETY: IMPLICATIONS FOR COUNTERMEASURE DEVELOPMENT**

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## **ABSTRACT**

The Monash University Accident Research Centre (MUARC) recently completed research that culminated in recommendations for an integrated package of countermeasures. These countermeasures are designed to enhance young driver and passenger safety in the Australian Capital Territory (ACT). This paper provides an overview of the literature on the effect of passengers on young driver safety; and describes road safety initiatives to date that have targeted young drivers and teenage passengers. This paper also summarises the method and key outcomes of the study undertaken by MUARC to investigate the role types, both positive and negative, that passengers currently play to influence driver behaviour, and the factors that determine the extent to which these roles types are played. Finally, this paper outlines the recommended countermeasures deriving from the research. These covered the areas of promotion, education, training, licensing, enforcement, and research. The recommended countermeasures are intended to enhance road safety by promoting the potentially positive influence of passengers and minimising the negative influence of passengers on young driver behaviour.

**Keywords** Passengers, young drivers, driver behaviour, road safety, countermeasures

## **INTRODUCTION**

In the ACT, 35 percent of vehicle occupants who were killed or seriously injured in a crash between 1995 and 1999 were passengers (1). Traditionally, however, the driver has been the main focus of road safety campaigns. There is a growing body of evidence that suggests that the presence of passengers has an effect, positive or negative, on the behaviour of the driver (e.g. 2, 3). However, relatively little research has been undertaken to examine the types of roles that passengers currently play that affect driver behaviour. If the behavioural interactions that take place between drivers and passengers were better understood, it would be possible to develop strategies for enhancing the positive role of passengers and minimising the negative role of passengers on driver behaviour. This issue was addressed in a study that was completed recently by MUARC for the NRMA-ACT Road Safety Trust. The aim of the study was to research the role types, both positive and negative, that passengers currently play to influence driver behaviour, the factors that determine the extent to which these roles types are played, the combinations of driver and passenger that promote safe driving, and those that promote unsafe driving, and from this research to make recommendations for countermeasures to enhance driver and passenger safety in the ACT.

First, this paper provides an overview of some of the key findings to date from epidemiological and behavioural studies that have investigated the effects of passengers on young drivers, and describes road safety strategies to date that have involved passengers. Second, it gives an overview of the method and key results of the MUARC study mentioned above, and third it describes the countermeasures derived from the study.

## **EFFECT OF PASSENGERS ON YOUNG DRIVERS**

Young drivers appear to be a road user group at particular risk from the potential negative influences of passengers. Several studies have demonstrated that the risk of a crash is greater for young drivers carrying passengers relative to older drivers carrying passengers (e.g. 4, 5). For example, Williams (5) reported on data from the United States that showed that for 16 to 17 year old drivers travelling with one passenger, the rate of crash involvement per 10,000 trips was more than five times that of drivers aged 30 to 59 years, and for 18 to 19 year old drivers, the rate was three times that of 30 to 59 year old drivers. Other studies have shown that the presence of passengers has a detrimental effect on the risk of a casualty crash for young drivers, but either no effect or a beneficial effect for older drivers (e.g. 6, 7). Not all passengers, however, have a detrimental effect on young driver safety. The age of the passenger, the sex of the driver relative to the sex of the passenger, the relationship between the driver and the passenger, and the number of passengers are all factors that have been observed to moderate the direction and magnitude of the effect of passengers on young drivers.

**Passenger Age.** Several studies have converged on the finding that teenage passengers constitute the greatest risk for young drivers (e.g. 2, 3, 6). Aldridge, et al. (2) examined the effect of passenger age on the crash risk of

young drivers aged 16 to 24 years by comparing three different occupant groups: first, where all passengers in the vehicle were age counterparts (12 to 24 years) of the young driver; second, where there was at least one adult or child passenger; and third, where the driver was unaccompanied. Young drivers were found to have the lowest crash risk for single vehicle crashes when carrying an adult or child as a passenger, and the greatest risk when transporting 12 to 24 year olds as passengers. Hence, adults or children as passengers had a beneficial effect on young driver crash risk, while passengers from a similar age group to the young driver had a detrimental effect.

**Driver Sex and Passenger Sex.** In general, it has been found that young male drivers have a greater crash propensity in the presence of passengers than young female drivers, and that male passengers place young drivers, male and female, at a greater risk of a crash than female passengers. Moreover, Chen, et al. (3), found that the driver-passenger combination at greatest risk of being involved in a fatal crash is a young male driver accompanied by a male passenger and the combination with the lowest risk is a young male driver carrying a female passenger. A similar pattern of outcomes was revealed by McKenna, et al. (8), who, through observation, investigated the effect of male and female passengers aged less than 25 years on the behaviour of male and female drivers aged less than 25 years in terms of speed choice, headway distance, and gap acceptance. In the absence of passengers, young male drivers were reported to drive less safely than young female drivers reflected in the greater speeds and shorter headways of the young male drivers. Both male and female young drivers, however, drove faster and accepted shorter gaps at junctions when accompanied by young male passengers, suggesting that young male passengers of young drivers have a negative influence on safety. In the presence of young female passengers however, young male drivers were observed to drive more safely, opting to drive at slower speeds and with a larger headway. Young female passengers had no impact on the driving behaviour of young female drivers.

**Driver-Passenger Relationship.** Rolls, et al. (9) demonstrated that it is not simply the age and sex of the passenger relative to the driver that is critical, but their relationship. Using interviews and questionnaires, it was reported that friends as passengers are generally a negative influence on the behaviour of the young driver aged 17 to 25 years, particularly the young male driver, thus compromising safety. This was thought to be in response to pressure from peers to engage in more dangerous and risky styles of driving, such as speeding. In contrast, passengers who were the young driver's children, partner, or parents were found to promote safer driving practices through the young driver's increased sense of responsibility or respect for another person's life.

**Number of Passengers.** Much epidemiological research has shown that the crash risk of young drivers increases further with each additional passenger that is present in the vehicle (e.g. 4). However, Aldridge, et al. (2) found that the increasing crash risk of young drivers aged 16 to 20 years with each additional passenger was restricted to the cases where the passengers were peers of the driver. When travelling with an adult or child the crash risk of young drivers was found to decrease with the number of passengers. Further, Chen, et al. (3) found that the fatal crash risk of 16 to 17 year old drivers increased with the number of male passengers for both male drivers and female drivers. However, while the fatal crash risk of young male drivers increased from the case of carrying a single female passenger to carrying two or more female passengers, the fatal crash risk of young female drivers did not. Rather, the fatal crash risk of young female drivers while carrying two or more female passengers was reduced slightly from that of the single female passenger case.

Taken together, the outcomes of these epidemiological and behavioural studies provide sufficient evidence that the presence of passengers has important consequences on both young driver and passenger safety. While an increase in risky and dangerous driving practices due to peer pressure has been suggested as the primary factor underlying young driver's elevated crash risk in the presence of their friends/peers as passengers (e.g. 9), inattentiveness to the driving task due to distraction caused by social interaction among peers might also play a role (5). Coupled with the young driver's inexperience, the young driver is not in the best position to deal with hazardous situations as they arise. Parents or adults in general, and children as passengers, however, appear to promote safer driving practices by the young driver through the young driver's increased sense of responsibility. Nevertheless, while the literature has shown that passengers influence young driver behaviour in some way, few road safety initiatives have been developed and implemented to date that involve passengers. To the knowledge of the authors only three initiatives have been developed that fall into this category, and all three have been aimed specifically at young novice drivers and teenage passengers.

#### **INITIATIVES TARGETING YOUNG NOVICE DRIVERS AND TEENAGE PASSENGERS**

The three initiatives known to have been implemented that involve passengers are: passenger restrictions in Graduated Licensing Systems, the Norwegian "Speak Out!" campaign, and the Transport Accident Commission

of Victoria's (TAC) "If you don't trust the driver don't get in" campaign. All three strategies aim to reduce the incidence of fatal and serious injury crashes among young novice drivers and teenage passengers. First, New Zealand and 15 US states have a passenger restriction as part of Graduated Licensing, which is a strategy that phases in young novice drivers' full driving privileges over a period of one or two years. This strategy is designed to ensure that young novice drivers mature and obtain necessary driving skills under conditions of low risk before graduating to more demanding driving conditions (5). For the young driver, carrying teenage passengers is a high-risk situation. All jurisdictions with passenger restrictions permit young newly licensed drivers to carry passengers only if the young driver is being supervised by a fully licensed adult driver. Results to date on the effectiveness of passenger restrictions are encouraging (e.g. 5, 10). An evaluation of the Californian passenger restriction, introduced in 1998, revealed a 23 percent reduction in the number of fatalities and injuries among teenage passengers travelling with 16-year-old passengers in 1999 compared with the five previous years (5).

The second initiative, the Norwegian Public Roads Administration's "Speak Out!" campaign was introduced in 1993 in the County of Sogn og Fjordane, Norway, and has since been launched in other Norwegian counties (11). This campaign, comprising both information/promotion and police enforcement, is designed to encourage teenage passengers to speak out to their teenage drivers about excessive speeding. An evaluation showed a 30 percent reduction in the proportion of fatalities and serious injuries among passengers aged 16 to 19 years but no change in the number of deaths and injuries among drivers aged 16 to 19 years. It is possible, therefore, that the effect of the campaign was not exclusively to empower teenage passengers to speak out, but rather to discourage passengers from driving with drivers who did not act on their advice to drive more safely (12). The third initiative, the TAC's "If you don't trust the driver, don't get in" campaign, was an advertisement televised in Victoria for a short period in the late 1990's. It was designed to appeal to young passengers to realise that they have a choice and that they do not have to travel with drivers whose responsibility or judgement they question. It was also intended to make young drivers think again before they engage in risky driving behaviours since they might have to live with the consequences of killing or injuring one or more of their passengers (13). While market research revealed that the campaign was successful in targeting males and females up to 30 years of age, there was some concern that the majority of the target audience interpreted the advertisement as an anti-drink driving initiative rather than as an initiative designed primarily to prevent young passengers from travelling with drivers that they do not trust.

It is reasonable to believe, that with greater recognition and understanding of the motives that underlie the effects of passengers on driver behaviour, and with additional evaluation studies demonstrating the effectiveness of existing campaigns, there will be a trend towards a more active role for passengers in new strategies designed to promote safety on the road. In the short term at least, the focus is likely to be on young drivers and passengers. This was the basis for the study undertaken by MUARC, which culminated in a set of recommendations for countermeasures to improve young driver and passenger safety in the ACT.

## **UNDERSTANDING PASSENGER INFLUENCES ON YOUNG DRIVER BEHAVIOUR**

The study undertaken by MUARC for the NRMA-ACT Road Safety Trust referred to earlier was designed to delineate current passenger roles, and the factors that moderate the extent to which these roles are played. The study included administration of a telephone survey and the conduct of focus groups. These are described below. For further details the reader is referred to Regan and Mitsopoulos (1) and Mitsopoulos and Regan (14).

### **METHOD**

**Telephone Survey** A total of 872 ACT residents who were at least 16 years of age, and who were drivers, passengers, or both completed the survey. Of these participants, 398 were male (45.6%) and 474 were female (54.5%); 224 participants were 16 to 24 years of age (25.7%), 340 were 25 to 54 years (39.0%) and 308 respondents were aged 55 years or older. There were two main parts to the survey: the driver's part and the passenger's part. Each part included questions to determine passengers' current roles; however, in the driver's part, completed by half of the participants, passengers' current roles could be ascertained from the perspective of the driver, while in the passenger's part the roles of passengers could be determined from the passenger's perspective. Factor analysis was used to delineate types of current passenger roles. In turn, a series of multivariate analyses of variance (MANOVAs) were carried out to determine to what extent the role types extracted from the factor analysis were affected by: driver age, passenger age, sex of the driver relative to the sex of the passenger, and the relationship between the driver and the passenger (e.g. spouse, child, friend).

**Focus Groups** Three focus groups were held in the ACT involving a total of 28 ACT residents, 14 males and 14 females, who were drivers, passengers, or both. In two of the groups, participants were aged between 16 to 73 years ( $M=42.5$ ;  $SD=18.0$ ); in the other group, participants were aged 17 to 24 years ( $M=19.9$ ;  $SD=2.4$ ) permitting a more in-depth discussion into the issues that influence young drivers' behaviour. Issues for discussion included: how do drivers feel and react to current passenger roles; how does the relationship, age and sex of the driver relative to the passenger influence these roles; what roles should passengers be playing to improve safety, and how can these roles best be implemented?

## RESULTS AND DISCUSSION

The telephone survey revealed that passengers currently play a number of role types: passengers determine whether their driver engages in *risky driving behaviours* (e.g. driving too close to the car in front) either implicitly through their physical presence or explicitly by telling the driver; they determine whether their driver engages in *anti-social driving behaviours* (e.g. spinning the wheels, or drink driving) either implicitly or explicitly; and, they determine whether their driver drives *responsibly* (e.g. notifying the driver of approaching hazards). In addition, passengers *talk* to their driver either socially or to keep their driver awake, and they *do* things for their driver to alleviate the driver's workload (e.g. answering the mobile phone).

Role types potentially encouraging risky driving behaviours and anti-social behaviours are the most likely to have negative implications for safety if acted upon by the driver. Roles of the responsible type have the greatest potential to be deemed as constructive by the driver with positive safety outcomes. The group discussions, however, revealed that passenger roles of the responsible type are generally perceived as constructive only if they occur before the event. The effect on safety, either positive or negative, of the talking and doing type roles is less clear. The focus groups revealed that not all drivers perceive these passenger roles to have the potential to enhance driver and passenger safety, but consider this type of passenger intervention to be distracting leaving less attention available for the driving task, compromising driver and passenger safety as a result.

The telephone survey also revealed that from the driver's perspective, the extent to which particular role types were played was determined by passenger age, driver-passenger relationship, and relative sex, but not by driver age. From the passenger's perspective, the extent to which particular role types were played was determined by driver age only. It seems therefore, that passengers are unaware that they are having the effects on drivers that drivers say that passengers are having on drivers. A countermeasure package, therefore, would need to incorporate strategies that target individuals from both the driver's and passenger's perspective, informing them of the influences, positive and negative, that passengers might have on driver behaviour.

From the driver's perspective, friends as passengers, 16 to 24 year old passengers, and male passengers regardless of the sex of the driver, were found to be the most likely to influence the extent roles of the negative type in general were played. However, 16 to 24 year old passengers were not significantly less likely than any of the other passenger age groups (5 to 15, 25 to 54, 55 +) to play roles of the responsible type. Similarly, friends as passengers were not significantly less likely than the driver's spouse or child, and male passengers were not significantly less likely than female passengers regardless of the driver's sex to play responsible roles.

Of further interest is that, from the driver's perspective, it was found that a friend of the driver is more likely to talk to the driver than the driver's spouse. This effect is of concern for the potential negative impact it might have on driver and passenger safety if the driver has difficulty dividing their attention between driving and talking and listening to their passenger. Young drivers might be at particular risk here because of their lack of driving experience, and hence, inability to sufficiently attend to the driving task (15). While it was found that a 16 to 24 year old passenger was more likely to talk to their driver than a passenger in any other age group examined, it was not examined in the telephone survey whether a 16 to 24 year old driver accompanied by a 16 to 24 year old passenger would have conversed more with this passenger than with a passenger in any other age group. The telephone survey component of the study was limited in that combinations of variables (e.g. passenger age and driver age) were not examined for potential interactive effects. This was because of potential statistical complications associated with conducting MANOVAs on data where there were only a small number of cases in any given level of variable combination. However, the focus groups, being qualitative, served to target combinations of drivers and passengers that might benefit, and those that might be adversely affected, if particular passenger roles are played. Young participants commented that they would be more likely to intervene as a passenger or to take advice as a driver, from their parents than from their friends. However, young drivers, males in particular, commented that as a passenger they would never discourage their male peers from engaging in risky driving behaviours, and might even explicitly encourage them to partake in such behaviours. As a driver,

many of the young males commented that they too would engage in risky driving practices to show off even if not explicitly asked to by their male peers travelling as passengers.

Through this research it was revealed that passengers currently play constructive roles, and that developing and implementing strategies promoting a constructive role for passengers seems possible. Young drivers in general, might benefit from having an “extra set of eyes”, as they already appear to listen to their parents and take advice from them if appropriate. However, the negative influence of young male friends as passengers of young drivers requires particular attention for young drivers who are susceptible to this influence. These findings provided the basis for the development of a range of countermeasures that aim to enhance the positive role of passengers and minimise the negative role of passengers on young driver behaviour in order to optimise safety.

## RECOMMENDATIONS FOR COUNTERMEASURE DEVELOPMENT

To assist in the development of recommendations for countermeasure development, a discussion was convened among a small group comprised primarily of road safety researchers and practitioners with expertise in countermeasure development, young driver safety and human behaviour. A package of countermeasures was recommended for the ACT to enhance young driver and passenger safety. It covered the areas of promotion, education, training, licensing, enforcement, and research.

**Promotion.** A promotional campaign was recommended to raise community awareness and support of the risks associated with carrying certain types of passengers. This campaign would need to target to young drivers and passengers and parents of young drivers. The key aims of the campaign would be to make people aware of the potentially negative and positive influences that passengers have on driver behaviour, and to empower passengers to speak up if they feel that the driver is compromising their safety.

**Education.** A range of educational materials and programs are currently in use in the ACT to teach pre-drivers and drivers about safe road use through schools and community groups. It was recommended therefore, that pre-driver and driver educational materials be developed and incorporated into current programs that reinforce the key messages of the promotional campaign.

**Training.** The pre-driver and driver training period provides an opportune time for drivers to acquire skills that will assist them as passengers to positively influence the safety of other drivers. Consideration should be given to incorporating into pre-driver and driver training programs principles of Crew Resource Management (CRM). This is a type of training used in the aviation industry to enhance communication and teamwork with the aircraft cockpit to optimise flight safety. CRM courses teach certain methods designed to empower flight crewmembers to speak up and to communicate more effectively with one another, especially under heavy workloads. For example, the “CRM assertiveness tool” could be used to empower passengers to speak up by using a hierarchy of verbal statements to bring safety concerns to the driver’s attention. If the passenger felt that the driver was exceeding the speed limit, he/she could first issue a “query” (e.g. *do you know what the speed limit is here?*). If this had no effect on the driver’s behaviour, the passenger could issue a “statement” (e.g. *we’re going too fast*). If this had no effect, the passenger could issue a “request” (e.g. *could you slow down a bit please?*). Finally, if this had no effect, the passenger could issue a “demand” (e.g. *either you slow down or you can stop the car and let me out*).

**Licensing.** The ACT driver licensing system provides an additional means for raising awareness among young drivers, in their capacity as both drivers and passengers, about the risks and benefits associated with carrying passengers. Consideration should be given to incorporating information into the preparatory handbooks for learner drivers, “Towards Your Ps in the ACT” and the “Road Rules Handbook”, about the positive and negative influences of passengers on driver behaviour and safety, and to incorporating items pertaining to the risks and benefits of carrying passengers into the ACT traffic knowledge test for learner drivers. It was also recommended that the ACT Government consider introducing a passenger restriction for newly licensed probationary drivers, given the encouraging reports to date of jurisdictions with passenger restrictions (see 5, 10).

**Enforcement.** Enforcement provides a mechanism for deterring risky or anti-social driving behaviour through an integrated system of road laws, penalties and detection methods. Consideration should be given to doubling the number of demerit points incurred by probationary drivers who commit a traffic offence while carrying passengers. Such a penalty regime could be introduced following the expiration of the passenger restriction period to deter young drivers from partaking in high-risk activities when carrying passengers.

**Research.** Further research is required before the recommended countermeasures described here can be fully developed and implemented. For example, it would be necessary to conduct focus testing of the themes and messages that underpin any proposed promotional campaign. Also required is closer examination of the Norwegian “Speak Out!” campaign, and currently implemented passenger restrictions. Focus testing would also need to be conducted to gauge the likely reaction of young drivers and their parents to passenger restrictions. Further research would need to be undertaken to quantify the costs and benefits of the proposed countermeasures, and an evaluation study would be necessary following the implementation of the countermeasures program to determine the program’s effectiveness in reducing young driver and passenger fatalities and serious injuries in the ACT.

## CONCLUSION

Passengers have a powerful influence on the behaviour of young drivers, which in turn has important implications on the safety of both drivers and passengers. Given the high proportion of passengers who are killed or seriously injured, it is time to develop and implement new countermeasures that focus on the behavioural influences of passengers on driver behaviour to enhance the safety of young drivers and passengers alike. The work reported here, if implemented, would be an important step in this direction.

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