Young Driver Research Program: Digest of Reports and Principal Findings of the Research

Prepared by:

T J Triggs
Monash University

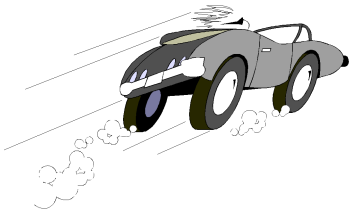
K B Smith
Federal Office of Road Safety

CR 164
1996

Federal Office of Road Safety

Department of Transport
Federal Office of Road Safety

Young Driver Research Program: Digest of Reports and Principal Findings of the Research



Prepared by:

Monash University
T J Triggs

Federal Office of Road Safety
K B Smith

Australian Government Publishing Service, Canberra

AGPS

Copyright information page

FEDERAL OFFICE OF ROAD SAFETY

DOCUMENT RETRIEVAL INFORMATION

Report No.	Date	Pages	ISBN	ISSN
CR 164	February 1996	i, 1-21	0 642 52389 9	0810 770X

Title and Subtitle

Young Driver Research Program: Digest of Reports and Principal Findings of the Research

Author(s)

Triggs T J Monash University Accident Research Centre
Smith K B Federal Office of Road Safety

Performing Organisation (Name and Address)

Monash University Accident Research Centre
Wellington Road
CLAYTON VIC 3168

Federal Office of Road Safety
GPO Box 594
CANBERRA ACT 2601

Sponsor/Available from:

Federal Office of Road Safety
GPO Box 594
CANBERRA ACT 2601

Abstract

Summary and overview of the content and findings of a Young Driver Research Program conducted by the Monash University Accident Research Centre on behalf of the Federal Office of Road Safety. The main reports of the research (ten main reports and a further ten technical sub-reports) have been published in the FORS CR (Consultant Report) series. This report covers mass data analysis, reviews of young driver crashes and performance characteristics, review of exposure reduction measures, evaluation of Australian Graduated Licensing schemes, study of the relative importance of age and experience, qualitative dimensions of young driver exposure, the 'young problem driver' issue.

This paper also reports on the outcome of a workshop held to discuss the findings and policy implications arising from the research.

Keywords

Young drivers, crashes, exposure, graduated licensing, driving experience, driving skills

NOTES:

(1) FORS Research reports are disseminated in the interests of information exchange.

(2) The views expressed are those of the author(s) and do not necessarily represent those of the Commonwealth Government.

FOREWORD

This document is intended to serve as a summary and overview of the content and findings of the Young Driver Research Program conducted by the Monash University Accident Research Centre from 1991 to 1994 and funded by the Federal Office of Road Safety (FORS) under the Federal Government's Road Safety Initiative. The research program resulted in ten research reports and a further ten technical reports containing detailed data analyses. These reports have been published as FORS Consultant Reports, and are listed at the end of this paper. All reports are available from FORS, but the technical reports were produced in limited numbers and distributed to official libraries and State authorities only.

The paper is intended to provide information on the research program, the subject areas examined, its content and major findings for the reader interested in the research and its outcomes, but for whom the detail contained in the nine individual reports or the technical data reports would be superfluous.

The reports of the Young Driver Research Program were released by the Parliamentary Secretary for Transport, Mr Neil O'Keefe MP on 30 August 1995.

To carry out the research commissioned by FORS, MUARC assembled a research team from MUARC itself and other organisations. The team was:

Bowland, L	MUARC
Catchpole J. E	ARRB Transport Research Ltd
Crettenden, A	now Transport Accident Commission
Drummond, A. E.	now private consultant
Foddy, B.	MUARC
Hancock, A.	MUARC
Haworth, N. L.	MUARC
Macdonald, W. A.	Latrobe University
Triggs, T. J.	MUARC
Yeo, E-Y	MUARC

The significant contribution of the professionalism and expertise of this team to the final product is acknowledged.

T. J. Triggs

K. B. Smith

Young Driver Research Program: Digest of Reports and Principal Findings of the Research

CONTENTS

FOREWORD i
1. INTRODUCTION: PUTTING THE YOUNG DRIVER PROBLEM IN CONTEXT 1
2. CONCEPTUAL OVERVIEW 2
3. PROGRAM RESEARCH AREAS AND OUTCOMES 3
3.1 Review of information on young driver crashes 3
3.2 Analysis of Australian and USA mass crash data sets 3
3.3 Young driver performance characteristics 4
3.4 Overview of exposure reduction measures 5
3.5 Evaluation of Australian Graduated Licensing Scheme 8
3.6 Relative importance of youth and inexperience in the novice driver problem 9
3.7 Qualitative dimensions of young driver exposure 10
3.8 The young driver problem versus the young problem driver 11
4. YOUNG DRIVER WORKSHOP 13
4.1 Education, Training and Assessment 13
4.2 Exposure Management, Enforcement And Deterrence 16
5. YOUNG DRIVER RESEARCH PROGRAM: THE REPORTS 18
DRIVER FATALITIES 1980-1994 19
DRIVER EXPERIENCE AND RISK OF CASUALTY CRASH INVOLVEMENT 20

1. INTRODUCTION: PUTTING THE YOUNG DRIVER PROBLEM IN CONTEXT

The over-involvement of young drivers in road crashes is widely understood in Australia to be a most serious and to date largely intractable road safety problem. Young people aged 15-24 make up 15% of the population but account for 31% of fatalities.

Australia is not alone in experiencing the phenomenon. International road crash statistics reflect the fact that there is a significant over-representation of young drivers in crashes in absolute terms or relative to their proportion of the population, licences held, or distance driven. This serious problem is also currently being addressed overseas. For example, significant attention is being devoted at present to the issue by the United States National Highway Traffic Safety Administration.

The Federal Office of Road Safety (FORS) research program at the Monash University Accident Research Centre involved a range of research tasks. These were designed to generate information which could contribute to the development of effective and efficient crash countermeasures for young drivers. Major aspects of the research program included:

- Detailed analysis of crash statistics based on Australia and United States databases. These analyses, in concert with other results, served as a basis for improving our understanding of the characteristics of young driver crashes. This process was complemented by additional information on young and novice drivers derived from recent behavioural studies.
- Graduated licensing is a high profile approach of significant current interest for controlling the way in which novices are introduced into the driving population. Graduated licensing schemes have been debated widely over the past 20 years. The Young Driver Research Program included an evaluation of Graduated Licensing Schemes implemented in Australian States and Territories.
- Policies aimed at reducing the risk exposure of young drivers are likely to be effective. The program considered in detail the topic of exposure reduction. In particular, an overview of the possible role of exposure reduction measures in lowering the incidence of young driver crashes was conducted. This overview was intended to provide a comprehensive basis for a detailed consideration of such measures. It is worth noting that countermeasures associated with graduated licensing and exposure reduction are frequently closely associated in analysis and implementation.
- To aid consideration of exposure reduction an in-depth analysis of the qualitative dimensions of exposure was conducted using both a nationwide driver survey and direct sampling of drivers.
- A minority group of young problem drivers has been widely regarded as contributing a very significant part of the overall problem associated with novice drivers. This concept was addressed in detail in the research program.
- The research program analysed in depth the fundamental question of the relative importance of age and experience as contributors to the novice driver problem.

In what follows, the conceptual basis for the FORS young driver research program is briefly overviewed. The findings of the major components of the research program are then presented briefly. These findings do not necessarily represent initiatives proposed by FORS. Application areas will be discussed that appear to have promise for the development of effective novice driver programs, but just as importantly areas will be identified that the FORS program research concluded would be less likely to provide a sound basis for effective or efficient countermeasure development.

2. CONCEPTUAL OVERVIEW

Young driver crash risk can be considered in two broad categories:

1) Factors determining exposure to crash risk that are external to the driver, and
2) the characteristics of the individual driver or the group to which she/he belongs.

Crash risk can be conceived as being determined by the interaction of factors in these two categories.

While discussed in detail in the series of FORS reports, it can be commented briefly that the program was guided by the three basic ways in which improvement of young driver safety can be achieved:

1) By enhancing the driving skill of novice drivers
2) By influencing the motivation of young drivers, and their personal approach to driving
3) By reducing the amount or modifying the type of driving young people are involved in.

A major factor in determining the research conducted in this program was the continuing very high rate of nighttime crashes (and high relative over-representation) of young and novice drivers.

3. PROGRAM RESEARCH AREAS AND OUTCOMES

3.1 Review of information on young driver crashes

Published mass crash data relating to young driver crashes were used to provide a description of the patterns of occurrence and characteristics of young driver crashes. Using data from a wide range of studies from Australia and overseas, the review reported on the effect of the following variables: driver age, experience, gender, time of crash, passenger characteristics, crash type, pre-crash vehicle manoeuvres, driver errors, and alcohol, movement and seat belt offences.

While the degree of over-involvement of young drivers varies somewhat according to the particular measure employed, one finding is clear across all jurisdictions: young drivers suffer a significant level of exposure to crash risk. It was concluded tentatively that both age and experience may be significant determinants of crash risk, with age predominating among young males and experience having a larger effect for females than young males. Young male drivers are more likely than young females to be involved in crashes due to excessive speed, while young females appear to be more involved than males in crashes due to inadequate driving skills.

In terms of crash involvement, exposure is a dominant factor determining crash rates at different times of the day and week for drivers of different ages. When no allowance is made for exposure, young drivers have much higher crash rates at nights and weekends. However, the studies reviewed showed a much less clear cut pattern when allowance was made for degree of exposure. This may be explained in part by the range of methods used to estimate exposure among the different studies.

The review concluded that no clear conclusion could be reached on the role of passengers as a causal factor in young driver crashes.

In terms of crash types, the youngest and most inexperienced drivers are involved in a greater proportion of single vehicle crashes at night compared with older drivers. Other crash types in which young drivers are cited as over-represented are head-on, overtaking, rear-end, and those involving poor vehicle control skills. Drivers in their early 20s appeared to have a problem of inattention or failure to anticipate. Drivers in this age bracket also tended to have a higher rate of alcohol involvement.

There is little information available on seat belt wearing in crashes. However, there is some evidence that non-wearing rates tend to be higher among young drivers and that non-wearing is associated with other non-driving behaviours that increase risk in some way (e.g. poor vehicle condition).

3.2 Analysis of Australian and USA mass crash data sets

Extensive analyses of Australian State data (New South Wales, South Australia and Victoria), the Federal Office of Road Safety 1988 Fatality File, and the USA General Estimates System (GES) 1989 data files were carried out. The analyses focussed particularly on the issue of night/day variation and its interaction with age and other factors, and a brief overview of conclusions is presented here.

The proportions of young drivers were clearly higher than those of older drivers for all types of single vehicle crashes. They were more likely to crash on curves and slopes, to be travelling above the speed limit or at excessive speed, and to be associated with "loss of control". Such circumstances were more likely at night.

The higher incidence of single-vehicle crashes for young drivers, often entailing loss of control, may suggest inadequate vehicle control skills. Another significant factor might be age-related differences in the way in which drivers perceive hazards and associated risks. Young drivers may be poorer than more mature drivers in perceiving and interpreting the curvature and gradient of the road ahead.

Overall, the results indicated some differences between young and mature driver crash patterns and large differences between daytime and nighttime patterns. The FORS report highlighted the need for more information on the different patterns of exposure to risk of young versus mature drivers under both day and night conditions.

3.3 Young driver performance characteristics

An extensive literature review on the behavioural and personal characteristics of young drivers was undertaken as part of the FORS program. Two broad categories of factors were considered: personal characteristics (skill, motivation) and exposure to crash risk.

It was concluded that there is insufficient evidence to define the types and amounts of experience needed to acquire an appropriate repertoire of driving skills. There is a recognised need for more research on the processes entailed in developing such skills.

Vehicle control skills appear to improve fairly rapidly with experience, but their development may be incomplete even after several years of driving.

Less skilled drivers have to devote a greater proportion of their available attention resources to higher level decision making and monitoring of their driving. This requires different strategies of attention allocation between different aspects of the task. As drivers develop cognitive schemata (mental 'maps' or models of the road and traffic environment) associated with the task, the demands on a driver's attentional capacity is reduced. The development of more accurate and detailed schemata of traffic situations means that the expectancies of young drivers gradually come to correspond more closely with reality.

While their cognitive schemata are less well developed, young drivers tend to show an over-reliance on formal road rules or laws. Under such circumstances, their direction and prioritisation of attentional resources is less well suited to the contingencies of the driving task. One result is that young drivers are less able to appreciate and allow for the fact that others do not always obey rules or behave in expected ways.

The literature suggests that drivers at lesser levels of experience are not as able to perceive hazards and risks well. When young drivers underestimate risk, this can be attributed to either their failure to recognise the degree of potential danger, or their overestimation of their own coping ability, or both. There is some evidence that

crash risk is highest during the intermediate phase of skill development, when still developing skills tend to be combined with over-inflated levels of confidence in driving skill.

At night, the crash risk is increased for all drivers but particularly for novice drivers. This may be because of less developed expectancies and cognitive schemata. When visual information is degraded as it is at night, speed-related errors may increase because of a failure to adapt information acquisition behaviour appropriately to the degraded circumstances.

Crash risk is influenced by driver motivation as well as skills. It is recognised that the personal goals or motives of young drivers may sometimes conflict with safety-related goals. Young drivers may be less willing than older drivers to modify their driving by slowing down to compensate for other attentional demands.

Personal traits such as rebelliousness have been associated in the literature with crash risk among young males but not among young females, while young females may have greater skill-related deficits. It should be recognised that some behaviours that may appear to be marginal in safety terms because of motivational factors may in fact be a result of lack of skill. For example, excessive speeding or following too closely might not arise from deliberate risk taking. They may reflect a lack of skill in hazard perception and cognition. This means that for some aspects of performance, there may be competing explanations of skill or motivational influences.

The review notes that decisions made prior to driving can influence the subsequent exposure to crash risk, independent of actual driving performance. Additionally, there is evidence of correlations between motivation to drive in a risky manner, and motivation which increases exposure to risk. For example, young persons drive more at night and they are less likely to be wearing seat belts.

3.4 Overview of exposure reduction measures

It has been commonly recognised that there are potentially significant road safety benefits to be obtained from reducing the opportunity for young drivers to be exposed to those situations and environments that are associated with high risk of crashes.

The overview of exposure reduction measures conducted during the FORS program provided a comprehensive coverage of the technical and strategic issues with reference to a range of contextual factors. The review discussed a range of issues that should influence the decision making associated with whether to implement a particular measure or not.

The report noted that for any exposure reduction scheme a balance must be reached ultimately between competing objectives. An example of this is, of course, the likely trade off between mobility of the young in the community on the one hand, and their safety on the other. Because of these competing objectives, the development of countermeasures in this area clearly should involve significant emphasis on the policy process and public debate. This debate should particularly consider the trade off between the safety benefits resulting from the restrictions of exposure reduction methods and the mobility and other costs associated with them. Methods need to be

developed and adopted for quantifying the value of such costs, because as yet there is little information on the value of novice driver mobility that can be used for formal modelling or comparative purposes.

This review concluded that potential young driver exposure reduction measures fall into four categories:

- measures that are very likely to be successful, but face strong challenges to implementation (for example, nighttime driving restrictions)
- measures that can be judged to be unlikely to be effective with some possibility of a safety disbenefit, but which enjoy some policy support (for example, occupancy restrictions)
- measures that are likely to have beneficial effects on young driver safety, but only marginally (e.g. vehicle power limits)
- measures which have the potential to reduce young driver crashes but which could likely benefit from further research to make them more effective (e.g. zero BAC requirements for the young)

Classifying measures in this way can serve the very useful purpose of channelling consideration of exposure reduction as a general countermeasure method towards those types of measures that are most likely to be both effective and justifiable from a community viewpoint.

Graduated licensing schemes are of direct relevance to the consideration of exposure reduction measures. To an extent, there is an overlap in the issues that relate to the implementation of both types of crash countermeasure. Different models of graduated licensing can vary in the degree to which direct exposure to more risky environments is limited. When the forms of graduation are such that the direct limitations on the more risky exposure are diluted, the ability of the graduated licensing scheme to structure the accumulation of experience is not as rigorous.

The overview of exposure reduction measures raised an important issue of research and development that warrants significant further discussion. This issue relates to the level of understanding of the problem area that is required before an exposure reduction measure can be implemented. Additionally, the review argues that there is a need to discuss the balance between the countermeasure criteria of effectiveness, efficiency and equity.

The decision making process involved in implementing an exposure reduction measure needs to take account of a wide range of factors. An important issue is to determine the relative importance of the range of factors listed below and how these factors should influence the decision making process:

- The potential for, and magnitude of, exposure transfer by the target group
- The possibility of behavioural changes in the target group
- The probability of differential effects within the target group
- Discouragement versus prohibition strategies
- Duration and scope of exposure reduction measures

- The potential for exposure and/or behavioural changes by non-affected drivers
- The type of implementation process
- Enforcement resources and priorities
- Penalties for non-compliance
- Mobility and social costs

Night driving restrictions The overview gave significant attention to the question of exposure reduction measures associated with nighttime driving. It was concluded that the concept of nighttime restrictions for young drivers is a multidimensional one that lends itself to the potential application of innovative approaches in the definition, structure and intent of a nighttime driving restriction. The message of the overview is, however, quite clear. On the basis of likely effectiveness, there is a very strong case that can be made for the introduction of driving restrictions at night for young drivers. However, given a licensing age of 17 in most States in Australia there are significant equity issues to be considered that make it unlikely that night time driving restrictions would receive policy support.

Legal age limits Likewise, the report also concluded that raising the driving age (17 in most jurisdictions) and increasing the legal drinking age (18 years) were measures that are likely to be effective but are unlikely to be implemented.

Passenger restrictions In contrast, the overview concluded that exposure reduction countermeasures restricting the carrying of passengers by young or inexperienced drivers are unlikely to be effective. It further concluded, on the basis of first principles, that nighttime driving restrictions should always be preferred to a passenger restriction.

Alcohol The analysis of the zero BAC legislation for young drivers suggested that a strong case can be made for its effectiveness, but further consideration to increase its effectiveness is warranted. There is potential for further evaluation and a need to review priorities for the enforcement of zero BAC legislation. It was suggested in the overview that zero BAC is being enforced as an exception rather than as a rule, and this probably raises a number of issues for debate and investigation.

Vehicles The overview of exposure reduction observed that vehicle based countermeasures have received very little technical or policy attention. The analysis suggested that a vehicle power countermeasure has potentially only marginal safety benefits. Vehicle transmission type restriction appears to hold greater promise than vehicle power limitation as a crash countermeasure. However, there is a need for further clarification and investigation of the potential safety benefits of driving task simplification for the young, of which the use of automatic transmissions in vehicles is one example.

3.5 Evaluation of Australian Graduated Licensing Scheme

Graduated licensing schemes seek to allow the novice driver to gain experience during the very vulnerable early months and years after licensing, while controlling exposure to risk and deterring illegal, high risk behaviour. The Australian road safety community has viewed graduated licensing in a very positive light because of the opportunity it provides to encourage young drivers to obtain experience under relatively safe conditions.

The Federal road safety package announced in December 1989 included a Graduated Licensing Scheme (GLS) for adoption by the States and Territories. There were six major components to that Scheme:

- zero BAC for learners
- zero BAC for first three years after obtaining a provisional licence
- no learner permits to be issued before 16 years of age
- no probationary licence to be issued before 17 years of age
- minimum period for a learner permit to be 6 months
- licences for automatic vehicles apply for the probationary period.

This 1989 scheme was a revision of an earlier model of graduated licensing proposed by FORS in 1983. Conformance to and support for the 1989 package were shown to be quite high in the evaluation conducted in the FORS research program, but it was noted that the scheme's components have not been uniformly adopted.

The evaluation of the graduated licensing schemes across the States showed that the minimum duration for which the learner's permit must be held does much more to ensure that a minimum amount of experience is gained before licensing (which is highly desirable) than solely allowing a low minimum age for the learner's permit and a high minimum age for the first licence. The evaluation showed that knowledge of zero BAC was limited, and that compliance with this requirement was high but not perfect. There appeared to be no clear relationship between compliance and enforcement, which raises the question of how Zero BAC should be enforced.

The use of licences restricted to automatic transmission vehicles discouraged the obtaining of licences in automatic vehicles and prevented some from driving cars owned by others. The road safety implications are, however, unclear.

Importantly, the evaluation found that Australian novice driver licensing systems do not strictly conform to the concept of graduated licensing. Some of the GLS components result in a reduction in the amount of exposure, rather than the alternative of enhancing the gaining of experience in a safer driving environment. A major likely result of increases in licensing age and duration of the learner's permit is a reduction in the amount of exposure, based on licences issued and distance driven.

Most of the restrictions placed on driving by Australia's graduated licensing system are based on time, rather than quality of the driving record. Motivation to drive safely, and consequently to develop skills while avoiding crashes, can be increased

by making driving record the determining factor in removing restrictions or imposing sanctions. At present graduated approaches only broadly structure the opportunity for gaining experience, and young drivers are required largely to learn using trial and error over extended practice. Indeed, it may be that our knowledge of the driving process is insufficiently developed to allow the licensing scheme to go beyond limiting the general domain in which driving can take place.

The adequacy of both legislation and enforcement was judged in the evaluation to be a likely major factor affecting the success of graduated licensing. It was concluded that the measures that can increase compliance with the restrictions include the compulsory carrying of photographic licences, higher enforcement of P-plate display, and appropriate penalties for violating the provisions of the licence.

Some potential disbenefits of current graduated licensing schemes were identified in the evaluation. First, if one effect of graduated licensing is to reduce experience, and experience is necessary if the ability to drive safely is to develop, then graduated licensing may lead to non-optimal learning. Second, graduated licensing may lead young drivers to taking steps to avoid being detected when violating provisions. Third, graduated licensing schemes will in some instances reduce mobility in the young.

3.6 Relative importance of youth and inexperience in the novice driver problem

Both age-related and experience-related factors have been considered to contribute to the elevated levels of risk associated with young drivers. Lack of driving experience is a strong contender as a major factor since driving skill is probably largely acquired through practice. On the other hand, a case can be made for the importance of age as a factor. Novice drivers are typically young, and as such may be motivated to drive fast or take other risks in order to test their own abilities, to demonstrate independence, or to impress their peers.

Although driver age and experience are highly correlated, it is important to determine which is the better predictor of crash risk because of the implications for countermeasure development. If experience is a better predictor then the young driver problem can be considered to result more from skill deficits that are diminished as experience develops. On the other hand, if age is found to be more important, countermeasures should be more focussed on moderating the effects of undesirable age-related motivational and lifestyle factors.

The several major previous investigations into the "age versus experience" question have employed methodologies that have shortcomings and, as a consequence, cast doubt on the conclusions. In particular, no systematic attempt had previously been made to identify the factors associated with early licence acquisition and to determine the relevance of such factors to crash risk. When this is not done, if early licensing in terms of age is associated with personal characteristics that elevate crash risk, the outcome would be an exaggerated age effect. Alternatively, if drivers who are inherently safer because of personal factors tend to obtain their licences earlier than others, this would bias the results towards experience being the more dominant factor. The study undertaken as part of the FORS program was designed to take account of such personal characteristics.

After allowing for differences in the time spent driving (level of exposure), the multivariate analysis showed that crash involvement was associated with two factors:

1) having few years of driving experience; and

2) "high recklessness".

The analyses showed that age was significantly correlated with crash involvement, but age as a factor did not significantly improve prediction of crash involvement after driving experience had been taken account of.

The primary role of inexperience in determining crash involvement suggests that insufficient skill plays a major role in crash causation. "Recklessness" (willingness to take risks in driving and non-driving contexts) was found not to be significantly related to age of licence acquisition, but it was significantly correlated with the respondent's age. It is worth noting that reckless behaviour and risk taking is of great current interest in adolescent psychology.

Young males reported more involvement in crashes than did young females. However, when the greater amount of driving undertaken by males is allowed for, there was no significant difference in the overall crash risk of males and females. As a consequence, since young males were significantly more reckless than young females, the study suggested that average skill levels may be higher among young males. Nevertheless, since experience predicted the crash risk of both males and females, inadequacy in skills appears to be a problem for all novice drivers.

This finding on the role of inexperience further highlights the need for improved methods of training to enhance safe driving skills. Note that this does not mean *more* training; rather it implies better, more effective training in the appropriate skills and capacities at the various stages of driving development. We do not yet know how to achieve this, nor how acquiring the 'right' skills can be assessed.

3.7 Qualitative dimensions of young driver exposure

Relatively little information is available concerning the specific factors contributing to young driver crashes. In particular, the very high level of risk associated with their nighttime driving is not clearly understood. Quantitative differences in exposure between novice and more experienced drivers are not able to account for their elevated risk of crash involvement at night.

While visibility is in general reduced under dark conditions, it can also be supposed that qualitative exposure factors may account in part for differences in crash risk. Young drivers who tend to be on the road at night may differ, individually, socially, or in the type of driving they undertake, from their more daytime-oriented counterparts.

The extensive study on this topic conducted in the FORS program aimed to establish whether there are appreciable differences in the qualitative aspects of driving exposure between young drivers classified as nighttime drivers and other young drivers, and whether these differences are more marked than for older drivers.

Five young driver sub-groups were identified that clearly differed in the characteristics of their reported driving exposure. In particular, a designated "nighttime" young driver sub-group appeared to differ in a number of ways from "daytime" young drivers. For example, they seemed more likely to drive cars more than 10 years old, more likely to drive their own car, more likely to be under pressure to get to their destination, more likely to be carrying passengers who are friends, and more likely to have received warnings in the last 12 months. It should be commented that the differences between the nighttime and other groups were not marked, so these results alone may not warrant specific measures for this nighttime group.

The overall results serve to highlight the fact that exposure reduction countermeasures applied to the young driver population will have a range of differential impacts on sub-groups of such drivers. Such impacts can be considered to be part of the "costs" of any particular restriction.

Additionally, this study raises for discussion the notion of applying targeted countermeasures to sub-groups within the young driver population. In some circumstances, this may be viewed as a desirable policy option, given the variability of crash risk within the young driver population. Such measures are likely to be efficient because of targeting, and equitable because they would be aimed at those most likely to be involved in crashes.

3.8 The young driver problem versus the young problem driver

The concept of a young problem driver sub-group who contribute disproportionately to the overall young driver problem is often raised when potential crash countermeasures are being considered. The widespread view that there is a sub-group that suffers a much higher than average level of crash risk has generated significant amounts of research, primarily investigating the influence of demographic, lifestyle and motivational factors. It is understandable why the identification of a particular problem group of young drivers based on biographical and personality characteristics is an attractive proposition, as it would provide a mechanism for directing road safety campaigns and possibly mediation with individuals and small groups.

The FORS program study in this area noted that the various theories addressing the 'young problem driver' and the 'young driver problem' dealing with behaviour, personal and skill variables tend to be relatively self-contained. Some of the more promising theories and ideas within each of these two conceptual areas do not consider aspects from the other. Taken overall, the individual theories appear to struggle to account for significant proportions of the variance in crash involvement. Problem Behaviour Theory has been viewed as providing a good conceptual foundation in the young problem driver area, but it can be argued that this approach has not met with significant success in predicting risk to date.

Additionally, experience with analytical or statistical models has shown that, even with extensive analysis and the control of relevant variables, it is extremely difficult to identify those drivers who will be involved in crashes with a high degree of accuracy. Even good identification procedures involving crash, violation and demographic information are very inefficient. While they can identify some problem

drivers, they lead substantial numbers of non-problem drivers to be falsely included in the problem group.

The report argued that there is very limited ability effectively to treat identified "problem" drivers through programs designed to reduce their risk of crash involvement. In any event only a small number of young drivers could be classified as 'young problem drivers' because of crash involvement. The cost-benefits of any such program would be questionable because the gains expected would only be low and because of the inclusion of those incorrectly identified.

The major conclusion of this study was that action designed to focus specific attention on young problem drivers should receive only low priority compared with other potential young driver safety initiatives.

4. YOUNG DRIVER WORKSHOP

The reports of this research program were released by the Parliamentary Secretary for Transport, Mr Neil O'Keefe MP on 30 August 1995. Following the release a workshop involving State licensing and safety authorities, the MUARC research team, independent safety experts and representatives of interested organisations such as driver trainers and motoring organisations was held in Melbourne on 4 October 1995.

That workshop aimed to address the specific issues for safety and regulatory authorities that were raised by the research and its findings, and to develop ideas for measures that the States and Territories might implement to improve young driver safety.

The emphasis was therefore on eliciting and identifying practical, implementable measures that could be taken up by State and Territory safety and licensing authorities. Because of this, the measures agreed to at the workshop do not always match those recommended by the research. For example, while night curfews for young drivers would have a significant safety benefit (see p.7 above), they were not considered a viable policy measure because of Australia's (mostly) relatively high licensing ages and the attendant equity issues.

The research outcomes were discussed under two main topic headings: *Education, Training and Assessment* and *Exposure Management, Enforcement and Deterrence*.

Using this framework, and on the basis of a set of *'agreed principles for policy consideration'*, the Workshop attempted to decide on:

- specific measures that can be implemented by the States and Territories;
- matters that warrant some further consideration but on which there is insufficient information at the present time to take action, and
- items considered and evaluated in the research program that are not considered to be viable policy options.

4.1 Education, Training and Assessment

4.1.1 Agreed principles for policy consideration

- The core aims of graduated licensing remain valid: to increase desirable experience and learning, to reduce exposure to risk while skills are still developing, and to deter illegal high risk behaviour (CR 136, 139)
  - with Australia's relatively high licensing ages, measures to increase the amount and range of experience during the L period may be a better approach to graduated licensing than restrictions during the P period
  - there are more opportunities during the L period for requiring the learner to do certain things, such as using a log book to ensure a minimum amount and

variety of practice is obtained, than there are during the P period. Gaining a licence can be used as a 'carrot' to encourage compliance

: measures of this kind for the provisional licence period, although just as desirable, can be applied effectively only if there is some form of assessment at the end of that period.

- Most current training, and particularly pre-licence training, is too narrowly focussed on vehicle control skills and formal road rules (CR 143)
  - there needs to be stronger and more explicit understanding by novice and beginning drivers that there is more to driving than vehicle control skills and knowing the road rules; that there are higher order cognitive and perceptual skills that are acquired over time.
- Learners are progressing to solo licence without adequate preparation (CR 136)
  - need to encourage learners to obtain a greater amount and variety of experience during the L period.
- The provisional licence period is an important part of the learning continuum - not just a stage to be got through before full licensing
  - this implies that there is scope for some sort of assessment at the end of the provisional licence period. No such assessment is in force in any jurisdiction in Australia.
- There is a clear need for some specific education about the risks and particular problems of night driving (CR 128, 131).
- Need to try and train and educate to anticipate and avoid trouble, not how to get out of it (a rejection of 'advanced' vehicle control skills) (CR 143).
- Learning about the road and traffic environment, responsibility for crashes etc should start at the earliest age (pre-school up)
  - with the objective of positively influencing safe driving behaviour later on.
- A minimum L-plate period is valuable for increasing experience (CR 136), but this needs to be supplemented by more direct means of practising and gaining experience during the L period. A log book to record the amount of driving practice has been suggested as a means of doing so.
- There is a need to develop simple sets of guidelines on the amount and breadth of experience that should be aimed for - ie a structured practice profile
  - to include night, freeway, wet weather and so on, with a log book to record the driving practice undertaken
  - with the explicit aim to provide parents with information and support, and to provide a valid supplement to professional training (where undertaken).

4.1.2 Measures for implementation

- Increase the amount and variety of practice and experience under controlled and, as far as possible, low risk conditions during both learner and post-learner (up to full licence) period, while avoiding exposure to high risk driving situations

- Promote and facilitate parental involvement in the learning process
- Give parents the material to equip them to help the novice.

4.1.3 Further information/research needed

- Process and stages of skills acquisition and development (CR 143): the optimum content (topics) sequence and timing of various elements of learning during the L and P phases; and stages at which assessed.
- There is need for an explicit examination of whether CBTA principles are relevant to driving. There is the issue of competency based training and assessment versus time periods for learner permit and provisional licence
  - in theory, CBTA need not require minimum time periods, which may conflict with the need for practice and gaining experience
  - on the other hand, time periods alone give no guarantee that experience is being gained.
- Given the imperfections of measurement, we probably need a combination of competency based assessments and experience requirements (covering amount and type of experience)
  - there are commercial pressures for professional instructors to compete on minimum time to gain a licence.
- Role and timing of hazard perception testing. Is there value in a two-stage approach at the end of the L and P periods? There is probably need for some form of incentive during the P period because compulsion is probably not feasible under present institutional arrangements
  - note that there might be a need to develop some training in hazard perception: there are equity implications of having a test that some can't pass.
- Use of technology as innovative means of at least informing and better, teaching about higher-order road system comprehension skills.
- Anything to learn from young driver crash types (especially night time crashes) (CR 128, 131) that can be used in training/education? Should this be limited to crash-specific skills (broadly defined) or is a broader repertoire appropriate?
- Need an operationally-defined, research based definition of safe driving - it is an essential basis for much training and education.
- Need innovative approaches to assessment of driving competence.
- Can some elements be moved back from P to L to make them more explicitly part of a learning process? - eg is there place for some unaccompanied driving during the L period
- Deliberate vs unintentional risktaking; role of combination of risktaking and misjudgment of risk (CR 129).

4.1.4 Not viable policy options

- Mandatory professional driver training
- Teaching high level vehicle control skills such as high speed cornering and skid control.

4.2 Exposure Management, Enforcement And Deterrence

4.2.1 Agreed principles for policy consideration

- Compulsory licence carriage and production on demand are of critical importance for the success of a graduated licensing system – including effective enforcement of zero alcohol restrictions (CR 136).
- Controlling risky behaviour is a more effective approach in the short term than attempting to change underlying attitudes (CR 143). It is often considered that these are implanted at a much earlier age, and are stable and resistant to change.
- Enhance the effectiveness of licence suspension as a deterrent and as a means of reducing driving by high risk drivers, by
  - compulsory licence carriage (CR 136)
  - selective random licence checks with licence production as a *primary* enforcement measure (ie so the police do not need to have stopped the driver for some other offence before they can ask to see the driver's licence)
  - significant penalties for unlicensed driving in order to provide a real deterrent.
- Use demerit points system and P-plates as means of controlling risky behaviour, but restrict licence suspension/removal to major offences - reduce the potential for unlicensed driving
  - need to balance between deterring undesirable behaviour and gaining experience
  - also need clear understanding of the rules for deterrence to be effective.
- Exposure reduction (removal of the licence) should be avoided as a penalty except in cases of flagrant or repeated breaches.
- Even with limited enforcement, existence of regulation will change behaviour of many drivers (CR 136, 139). To this extent, laws can be educative as well as restrictive and punitive.
- The survey of graduated licensing found that young drivers tended to accept the regulations that applied in their jurisdiction, even if they were more restrictive than those elsewhere (CR 139). Therefore, voluntary compliance is a factor that can be exploited.
- There is need for an effective driver licence database.
- Consistency of approach between the States is very important.
- Consider deterrence programs for unsafe behaviours that are not adequately covered at present (eg following distances). Is there a role for new technology?

- The research does not support some measures applied or considered appropriate as part of graduated licensing schemes, such as passenger restrictions (likely to be counterproductive in safety terms), speed restrictions (of doubtful safety benefit) and vehicle power restrictions (of marginal effect) (CR 130).

4.2.2 Measures for implementation

- Mandatory licence carriage and production on demand (in proposed national road rules)
- Mandatory display of L and P plates
- Intensified enforcement of Zero BAC (mostly 0.02 in practice) and better targetting of offences that cause crashes
- Licence production as primary enforcement measure.

4.2.3 Further information/research needed

- Ways of using demerit point scheme as incentive.
- A considered and comprehensive enforcement strategy for young drivers.
- Shortened period for display of P-plates for young people who avoid coming to official notice (crashes and violations) - but should there be a link to some minimum element of driving experience?
- Examine the importance of general road safety measures which may indirectly have an impact on young driver vulnerability.
- Linking duration of P-plate (not Zero BAC) to driving record through demerit points scheme (limited support and some dissent for this measure).
- Means of making licence checking easier - including investigating options offered by new technology.

4.2.4 Not viable policy options

- Night curfews
- Speed restrictions (majority view against but NSW still sees strong argument); eliminated in draft national road rules.
- Passenger restrictions (majority view against, but some support).
- Vehicle power restrictions (majority view against but some support).
- Young problem drivers.

5. YOUNG DRIVER RESEARCH PROGRAM: THE REPORTS

All of the following reports were written by members of the MUARC research team, either on the staff of MUARC or seconded for the purpose of the research program. All are published by FORS as part of its CR (Consultant Report) series. All reports are available from FORS on request, although for the general reader this document represents an adequate coverage of the issues examined and the findings.

However, Reports CR 131 (Parts 1-10) and CR 139 are highly technical in content and have been produced for limited distribution only to official libraries, safety authorities and similar users. The principal findings are reported in CR 131 (11) and CR 136 respectively.

Drummond, A.E., Triggs, T.J., Macdonald, W.A. & Bowland, L., *Young driver research program - overview report,* CR 121

Macdonald, W.A., *Young driver research program: A review of information on young driver crashes,* CR 128

Macdonald, W.A., *Young driver research program: A review of information on young driver performance characteristics and capacities,* CR 129

Drummond, A.E., *Young driver research program: A technical and strategic overview of exposure reduction measures as a means of reducing young driver crashes,* CR 130

Macdonald, W.A., Bowland, L. & Hancock, A., *Young driver research program: Mass crash data analyses - overview of results from Australian and USA mass crash database analyses,* CR 131 (Parts 1-11)

Haworth, N.L., *Young driver research program: Evaluation of Australian graduated licensing schemes,* CR 136

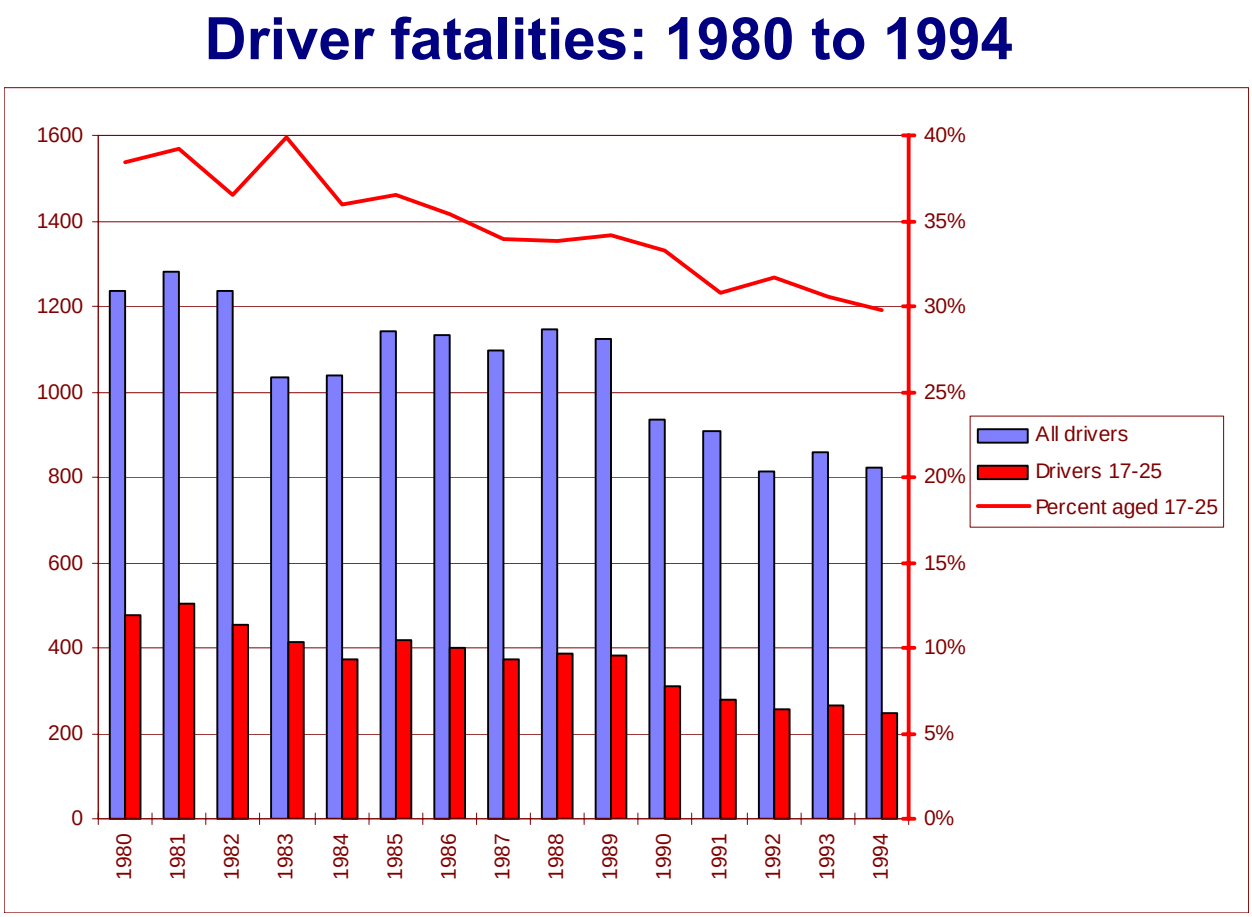
Haworth, N., Bowland, L. & Foddy, B., *Young driver research program: Graduated licensing survey - technical report and data,* CR 139

Catchpole, J.E., Macdonald, W.A. & Bowland, L., *Young driver research program: The influence of age-related and experience-related factors on reported driving behaviour and crashes,* CR 143

Crettenden, A., Yeo, E-Y.& Drummond, A., *Young driver research program: Qualitative dimensions of young driver driving exposure as a function of time of day,* CR 148

Crettenden, A. & Drummond, A.E., *Young driver research program: The young driver problem versus the young problem driver - a review and crash data analysis,* CR 151

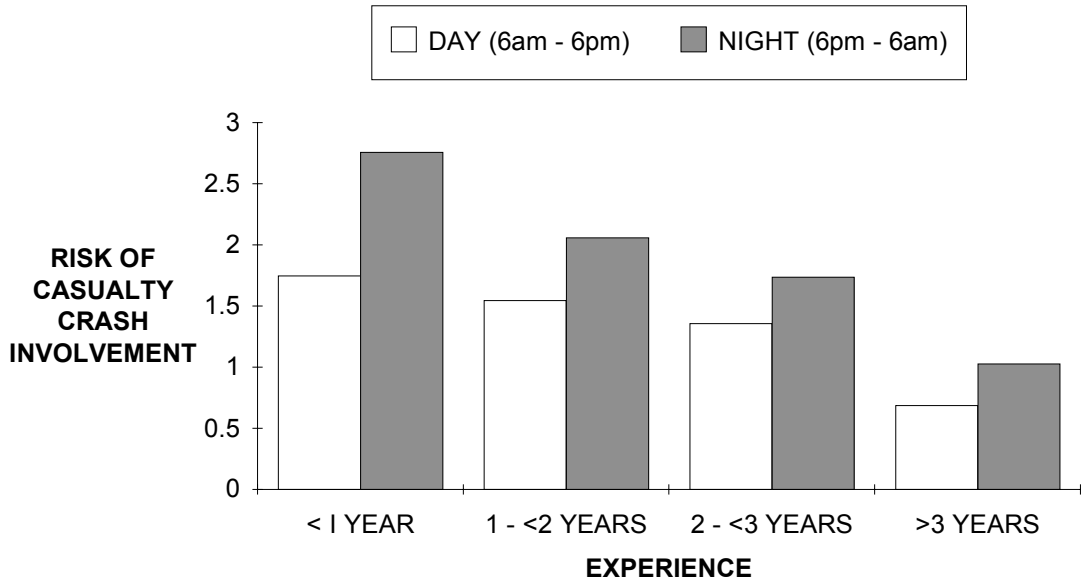
DRIVER FATALITIES 1980-1994



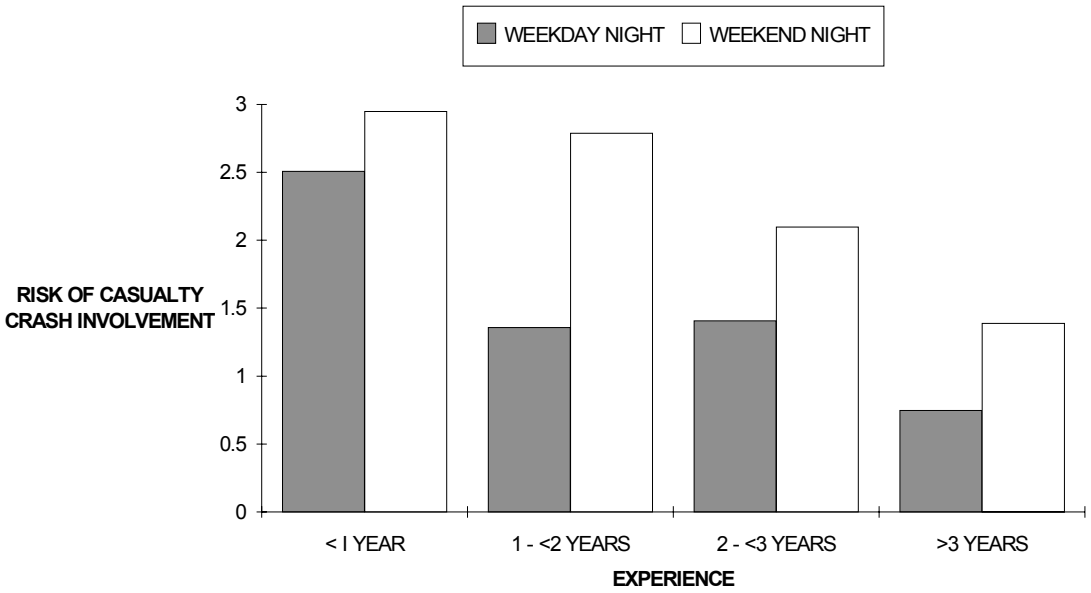
Source: Federal Office of Road Safety, 1995

DRIVER EXPERIENCE AND RISK OF CASUALTY CRASH INVOLVEMENT

RISK OF CASUALTY CRASH INVOLVEMENT (PER MILLION KILOMETRES) BY DRIVER EXPERIENCE AND TIME BLOCK



RISK OF CASUALTY CRASH INVOLVEMENT (PER MILLION KILOMETRES) BY TIME HELD LICENCE AND WEEKDAY/WEEKEND NIGHT



Source: Drummond A E (1995) *Young Driver Research Program: A Technical and Strategic Overview of Exposure Reduction Measures as a Means of Reducing Young Driver Crashes* FORS Report CR130 (Figs 11 & 12, pp 28, 29)