CREATING SAFER NEW DRIVERS: WHERE ARE WE AND CAN WE GO ANYWHERE FROM HERE?

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Abstract

This paper presents a review and discussion of available research on the effectiveness of driver training, considering previous research findings that driver training and education contribute little to subsequent safe performance of the novice driver. The paper examines issues identified in research on young novice driver safety. The paper concludes that there is research support for some form of post-licence education, particularly with respect to cognitive and attitudinal/motivational matters. The paper is intended to open the way for reconsideration of the issues and, if indicated, further research.

1.0 INTRODUCTION

A former paper [(1)] reviewed and outlined the current state of knowledge about creating safer new drivers: drivers less prone to crashes in the very vulnerable years 18-25. Other papers such as those by Christie [(2)] and Langford [(3)] have covered the same territory in more detail, as well as outlining the extent to which young drivers are over-represented in crash statistics. Evidence on the effectiveness of pre-licence training, and post-licence supplementary training of various types is also considered and found wanting. That material will be assumed and not covered in detail in this paper.

The additional elements covered in this paper reconsider some of the findings of earlier research on young driver safety (eg the Federal Office of Road Safety's *Young Driver Research Program* conducted in the early 1990s [(4)]) with specific reference to elements that many consider important to safe driving (eg Mayhew & Simpson, 1995 [(5)] and others). The paper also takes up and assesses papers presented and discussions at the recent *Developing Safer Drivers and Riders Conference* (Brisbane, 21-23 July 2002).

2.0 ACQUISITION OF DRIVING SKILL

Research since the start of the 1990s has identified the important elements in learning to drive, and in particular has identified the role of cognitive and judgemental skills (see for example Macdonald [(6)] and Mayhew and Simpson [(5)]. From this, researchers have emphasised the need to practise and gain experience in depth during the learner permit period. Authorities have taken up this suggestion by firstly requiring longer periods of learner permit tenure and more recently, in several Australian jurisdictions, requiring learners to complete a log book outlining the amount and type of experience gained. Various handbooks and guides such as the ACRS' *Surviving Your Teenager's Learner's Permit* and publications by the Victorian Transport Accident Commission and the NRMA, and others, all emphasise the same thing.

Why is this necessary? Research seems to suggest quite clearly that it is very difficult to gain many of the skills that enable a person to operate successfully in the traffic environment other than by gaining on-road experience. Even if there is intellectual knowledge of, for example, traffic hazards and how to cope with them, appreciation and hence appropriate response seems only to come experientially as cognitive and judgemental skills develop. Even the process of learning under a professional instructor contains but a small instructional element using didactic techniques and materials, compared with the amount of time spent on the road, going progressively from the most basic vehicle control manipulation through to safe negotiation of traffic using and developing cognitive and judgemental skills.

The issue becomes, therefore, how to assist the learner and then the novice to learn to drive safely. One can (or perhaps should) assume that 'safe' techniques such as observation, anticipating hazards and maintaining headways are taught as part of the instruction process. The critical question becomes, why is it that novices in the vulnerable 18-25 year age group are so over-represented in traffic crashes even when safe techniques are inculcated as part of the learning process?

Mayhew and Simpson [(5)] have noted that "There is some evidence that at least some driver education programs can successfully teach driving skills and impart knowledge, but skills and knowledge acquired in training do not necessarily produce driving behavior [sic] that leads to reduced crash involvement". To this we will return, but first it is useful to consider the matter of safe driving itself.

3.0 SAFE DRIVING

Although the factors involved in crashes that young people have are as well understood as those for other groups of drivers, it is not possible to be sure what distinguishes 'safe' from 'unsafe' driving (apart from obvious matters such as alcohol, excessive speed, close following and other clearly risky behaviours), and why some young people manage to avoid crashes and others do not. To say that 'safe' driving consists in an absence of collisions is insufficient and has no explanatory power. Macdonald [7] identified a number of crash types and characteristics that are typical of young drivers: 'loss of control' type crashes amongst the youngest group, including a high rate of single vehicle crashes (but these were also linked with 'reckless' behaviour and excessive speed). Other crashes resulted from inattention or failure to anticipate, or perceptual and cognitive errors. Intersection, manoeuvring and merging crashes were more characteristic of older young drivers than those under 20.

Crash types and circumstances other than those related to youthful recklessness, especially where they involve inattention or failure to anticipate, are not necessarily characteristic of young drivers. Macdonald [7] found that there was evidence that young drivers were not necessarily more likely to be at fault in rear end crashes. Drivers older than the vulnerable 18-25 age group were just as or more likely to be involved in crashes involving alcohol, excessive speed, not wearing seat belts, as young drivers. Young people may be over-represented for reasons of exposure, or because their behaviour or the errors they commit are compounded by less well developed cognitive and judgement skills, or by motivation, peer pressure and other age specific factors.

> "Whatever perspective on the driver we choose, it is clear that the vast majority of deaths and injuries on the roads are caused by the actions of 'normal' drivers, as opposed to those who can be identified as deviant, abnormal, or particularly 'bad' drivers…Surprisingly little is known about the details of normal driver behaviours that lead to the vast majority of collisions. If we look at individual cases, we can see specific errors, but we can rarely see why this error, which is probably very common….led to a crash this time and not the other gazillion times it was committed. This limits the current choice of priority behaviours targeted for change to obvious general categories of behaviour – such as impaired driving, speeding, tailgating" [8]

And these general categories of behaviour, as already seen, are not easily amenable to correction in any group. If they were, the only road crashes we observe would be those directly attributable to some form of impairment or vehicle defect – and perhaps many fewer of those.

Langford [3] echoes many researchers and thinkers when he points out that 'training courses typically aim to improve basic driving skills and knowledge whereas the research indicates that these have a minimal role in crash causation'.

As many researchers and others have pointed out, there is a great gap between what one has the knowledge to do and is capable of, and what one chooses to do. Christie [9] noted that driving skill deficiencies have been found in less than 5% of crash involvement; while Sabey (cited in Hirsh [10]) concluded that 95% of crashes result solely or partly from human error. It is safe to say that in many instances those 'errors' are failures of attention or anticipation or observation: failures of exercise not of ability.

Having said this, several researchers are of the view that novice drivers typically have deficiencies in higher-order skills and capacities. Mayhew and Simpson [5] identified empirical research support for eight skills and capabilities that are central to reducing the risk of collision for young drivers. These are:

- Steering control
- Speed control
- Parallel processing/multitasking - skill integration
- Visual search/scanning
- Hazard detection
- Risk assessment
- Decision making
- Risky lifestyle and risk taking.

Harrison suggests that hazard perception and ability to correctly observe what is in the driving environment might be candidates for attention:

> "Some of the characteristics of novice drivers that are thought likely to increase crash risk include peculiarities in the weighting given to various potential hazards in the road environment, the foci of visual scanning, and poor levels of attentional control and situation awareness. These could all conceivably be the appropriate targets for training efforts for novice drivers" … "[these] characteristics

> … that are associated with crash risk in inexperienced drivers are for the most part characteristics that are more prevalent or more characteristic of less-experienced drivers" [11].

These considerations provide some leads that might usefully be pursued. However enhancing capacities in these areas, even if successful, cannot be expected to make a significant contribution to reducing road crashes, unless accompanied by attempts to modify two problem areas of very considerable concern where the young are concerned: risk and motivation.

4.0 RISK AND MOTIVATION

There is an element of risk in everything we do. The risk of injury or worse is there at every point and is compounded by the complexity of the things we do and the mechanical contrivances with which we surround ourselves. Where we can perceive the risk and exercise some control we avoid or reduce risks by making judgements and responding to circumstances and occurrences around us.

Successfully avoiding damage depends on making accurate judgements about the immediacy and extent of the risk and responding accordingly. This in turn depends on accurate knowledge about it. Risk researchers [12] are generally of the view that knowledge is not accurate (if we knew the extent of the crash risk of overtaking on that particular stretch of two lane rural road we would probably not do it; if we knew the true extent of enforcement effort on a particular highway we might pay less attention to the speed limit than we do). Lonero further suggests that 85% of crashes result from drivers' 'risky actions'. It is safe to say that the 95% of crashes that Sabey concluded resulted solely or partly from human error [10] included cases of misperception of the risk, perhaps in as simple a manner as misjudging gaps and approach speed.

But knowledge and accurate judgement are not the only components in managing risk. Equally and perhaps arguably more important is what we choose to do and how we choose to respond. According to Lonero because driving is a self-paced task,

> "it is our own actions that determine the difficulty of the task and the risk we experience. This means, of course, that our motivation is more important than our capacities and limitations in contributing to risk. What we are able to do as drivers and what we choose to do are often very different – for instance, every driver is capable of driving at the speed limit[1] but many choose not to do it" [12].

Motivation and ability are intertwined. The highest risk drivers, in Australia 18-25 year olds, are over-represented because their ability to perceive hazards and judge risk is undeveloped and because they are not well motivated to avoid risk. The next highest crash risk group (elderly drivers) have much higher motivation to avoid risk but have limitations on their capacities [12].

Young people, and especially young males, are particularly risk prone, simply because they are young and male [13, 14, 15]. Therefore, immaturity, overconfidence and lack of appreciation of consequences are joined to insufficiently developed cognitive and judgemental capacities to make a potent mix of disadvantages. Of these, motivation and overconfidence are probably the prior and more important concerns. Christie notes that there is theoretical support for training that targets optimism bias, overconfidence and attitudinal/motivational factors [2].

We should consider therefore whether there is any role for education or training with respect to optimism bias and overconfidence. Insight training has been considered to hold promise [2, 16]. Insight training refers to 'any program that aims to raise novice drivers' awareness of limitations in their driving skills and their underestimation of risk, with the focus being more on attitudinal/motivational factors associated with driving than basic vehicle handling skills' [16]. There is growing interest in programs of this type: the ACT's *Road Ready Plus* program for novices who have held their Provisional licences for more than six months is one. A program run as a pilot by the ACT Fire Brigade in ACT colleges in 2001, designed to create awareness of the long term consequences of road crashes and provide strategies to help young persons avoid being put in, or to be able to withdraw from, risky situations, is another [17].

Neilsen [18] proposes a new 'fatal four' factors in young driver crashes (instead of alcohol, speed, fatigue and non use of seat belts): peer influence, risk taking, inexperience, overconfidence, and says that these issues are components of training, and certainly the 'better' training now offered by post-licence trainers and educators. Thomas [19] has noted that 'driver training is only useful if it investigates the driver's motivation to learn and to

[1] Note, of course, that driving at the speed limit does not of itself equate to driving safely.

apply new skills in everyday situations. Additionally, training must increase a driver's awareness of the risks or hazards likely to be encountered on the roads and teach the skills necessary to avoid hazards". Both authors address issues of overconfidence and the need for a correct appreciation of the risks.

5.0 POST LICENCE DRIVER EDUCATION

These considerations of motivation and maturational issues, evidence of deficiencies (or at least a very long learning process) in the acquisition of cognitive and judgemental skills, and a growing interest in and theoretical research support for insight training, seem to suggest that there is an opportunity that could be exploited. I have presented a case elsewhere (1) for a post-licence education program[2] that targets overconfidence, that provides insights into the cognitive and judgemental factors in learning to drive, and that possibly provides additional instruction on managing the vehicle in a dynamic traffic system, at a critical point in the learning process, i.e. about six months after a provisional licence permitting unaccompanied driving is awarded.

It is evident from the research evidence (eg Mayhew and Simpson [5], the review of insight training by Senserrick [16] and others) that none of this is particularly new. The recent *Developing Safer Drivers and Riders* conference in Brisbane showed that at least some post-licence driver trainers have shown an appreciation of the findings of research about the process of learning to drive. It may be that the driver training industry has moved further in this area than have road safety researchers and government authorities have in appreciating what driver trainers do.

Comment has been offered that researchers and government agencies appeared to show little knowledge of recent developments in post-licence training: apart from work on insight training studied by Gregerson and others (reported in Senserrick [16]), very little actual study of post-licence training (as distinct from review of previous studies) has been recent, and certainly does not cover the type of training that several post-licence trainers now claim to offer (18). The main exception to this is perhaps fleet safety management, in which there has been considerable development in the last decade. Neilsen (18) points out that the driver training industry has moved on from the kinds of courses being offered at the time evaluations were carried out: "it is doubtful if any provider of post-licence driver training in Australia is still doing things the same as they were 12 months ago, let alone in 1995". It is apparent that it is time for a officialdom to take a closer look at what is being offered in post-licence driver training, to appreciate and encourage 'good' work where it is being done, and to provide guidance for operators wishing to provide training that is in keeping with research evidence and does not violate safety principles.

This does not mean that governments should provide official endorsement of post-licence training programs. This is not necessary and probably not desirable. Setting up and running a post-licence training operation remains a commercial decision with all the accompanying risks. But it is a reasonable expectation for official agencies to take notice of what is offered and provide guidance on what is potentially beneficial in safety terms. It is also perhaps time for evaluation of the post-licence training that is now on offer. For cost and scale reasons, and the usual difficulty of isolating and identifying the effect of a measure from a host of confounding factors, it may be difficult to demonstrate safety benefit in terms of reduced road crashes in the target group. But in terms of simple justice it is appropriate to evaluate what is being done now, and not to continue to draw on evaluations up to two decades old.

It is recognised that benefit may be potential rather than actual. Mayhew and Simpson (5) and others have warned that increased knowledge does not necessarily lead to reduced crash involvement. Neilsen has argued that expecting training and education to produce reduced crash rates is not paralleled by similar kinds of expectations in other fields. But increased safety awareness, reduced overconfidence, self-appraisal (20), identifying and correcting deficiencies are unlikely to be detrimental. At least some individuals who seek to undertake a post licence driving course are already partly if not wholly motivated by safety considerations. Thomas (19) suggests that there is a youthful enthusiasm for driving (the freedom that driving a car brings into their lives) that could be tapped into.

It is a view of this writer that we generally do not consider driving as a task in its own right, or as something to be enjoyed for its own sake. Reference to this aspect in road safety literature is almost totally absent, and it can be argued that 'normal' road safety messages have little to say to people who consider themselves driving enthusiasts. Except for true 'leisure' journeys (and even in that case there are other motivations) we consider driving as just an interval between being here and getting there. Perhaps like other skilled tasks (like writing a research paper or flying a plane or fly fishing) we should treat driving as an activity that is worthy of

[2] The term 'education' is used deliberately, using the same definition and for the same reasons as Christie (2)

concentration, conscious thought, attention and judgement. Courses that give attention to this aspect and also focus on safety should be encouraged and not dismissed.

6.0 CONCLUSIONS

This paper has argued that a re-appraisal of the research evidence on the process of learning to drive suggests that there exist opportunities improve cognitive and judgemental capacities, and to target overconfidence and optimism bias. The appropriate time for this to occur is probably in the months immediately following award of a provisional licence. At this juncture the novice probably has an appreciation that the difficulty and the risks are greater than appeared while driving accompanied (and perhaps this is so regardless of the amount of pre-licence driving practice), and may have a willingness to learn that can be tapped.

At the same time, the recent *Developing Safer Drivers and Riders Conference* indicated that at least some post-licence trainers and educators are aware of and are applying research evidence on the learning process, and in particular are targeting overconfidence, risk and inadequate appraisal by novice drivers of their capacities – endorsing principles of 'insight' training that researchers have found to show some promise. Programs of this kind need not, and perhaps should not, be endorsed by governments, but their accord with established safety principles and accredited research can be recognised and encouraged, and guidance provided on the best principles to adopt.

REFERENCES

(1) Smith K B (2002) Creating safer new drivers in *Proceedings*, Developing Safer Drivers and Riders Conference, the Travelsafe Committee of the Queensland Parliament and the Australian College of Road Safety, Brisbane 21-23 July 2002 pp. 81-90

(2) Christie R (2001) The effectiveness of driver training as a road safety measure: an international review of the literature in *Proceedings*, 2001 Road Safety Research, Policing and Education Conference, Melbourne 18-20 November, pp 56-61

(3) Langford J (2002) Using the research to reduce novice driver crashes in *Proceedings*, Developing Safer Drivers and Riders Conference, the Travelsafe Committee of the Queensland Parliament and the Australian College of Road Safety, Brisbane 21-23 July 2002 pp. 33-44

(4) The *Young Driver Research Program* conducted by the Monash University Accident Research Centre on behalf of the Federal Office of Road Safety: FORS Consultant Reports CR 128, 129, 130, 131, 136, 143, 148, 151, 164

(5) Mayhew D and Simpson H (1995) *The role of driving experience: Implications for the training and licensing of new drivers* Ottawa, Ontario, Canada, Traffic Injury Research Foundation in Lonero, 1997

(6) Macdonald, WA (1994) *Young Driver Research Program - A Review of Information on Young Driver Performance Characteristics and Capacities* FORS Report CR 129

(7) Macdonald WA (1994) *Young Driver Research Program – A Review of Information on Young Driver Crashes* FORS Report CR128

(8) Lonero, L P (1997) *Reinventing Driver Education: Strategic Directions for Driver Ed in the 21st Century*, Northport Associates, Ontario

(9) Christie R (1991) *Brief summary of the effects of driver training on road accident involvement rates* VicRoads, unpublished note

(10) Hirsch, P (1997) *Is legal driving safe driving?* www.drivers.com, July 2001

(11) Harrison WA (1997) The limited potential of training for learner drivers: a view from the psychologist's lab *Proceedings*, Conference on Young Drivers, Sydney 30 April 1997, ACRS

(12) Lonero, L P (1998), *Risk mentality: why drivers take the risk they do* www.drivers.com

(13) Hewitt N, Elliott B and Shanahan P (1995) *A review of risk behaviours among 15-24 year olds* Commonwealth Department of Human Services and Health, Canberra

(14) Fletcher R, Hamilton D and Hewitson P *Fathers talking to their sons about risky driving* NRMA Today Edition 14, 1997, pp.7-16

(15) Faulks I J, Smith K B and Smith K P (eds) (1997) *Proceedings* Young Drivers Seminar Parliament of NSW, Sydney

(16) Senserrick T M (2002) Training young drivers: can it work? in *Proceedings*, Developing Safer Drivers and Riders Conference, the Travelsafe Committee of the Queensland Parliament and the Australian College of Road Safety, Brisbane 21-23 July 2002 pp. 71-79

(17) Donovan B and Smith K B (2001) *Road awareness and accident prevention program for young drivers ACT Colleges pilot 2001: Evaluation report for ACT Fire Brigade* ACT Fire and Rescue Service, Canberra

(18) Neilsen J (2002) Novice driver training, exploding the myths and misconceptions, in *Proceedings*, Developing Safer Drivers and Riders Conference, the Travelsafe Committee of the Queensland Parliament and the Australian College of Road Safety, Brisbane 21-23 July 2002 pp. 179-204

(19) Thomas G (2002) It's driver learning not driver training – why have we crashed the debate? in *Proceedings*, Developing Safer Drivers and Riders Conference, the Travelsafe Committee of the Queensland Parliament and the Australian College of Road Safety, Brisbane 21-23 July 2002 pp. 81-90

(20) Bailey, T (2002) novice driver self monitoring, in *Proceedings*, Developing Safer Drivers and Riders Conference, the Travelsafe Committee of the Queensland Parliament and the Australian College of Road Safety, Brisbane 21-23 July 2002 pp. 129-140