Teaching Old Dogs New Tricks? : Training and Older Motorcyclists

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ABSTRACT

Past studies of the effects of motorcycle training on crash involvement have shown mixed results. However, many of the studies were conducted when most trainee riders were aged under 20. Now, many trainees are older and have considerable car driving experience. Training programs have also changed. For these reasons, this paper examines the training history of a sample of older riders and the links to their crash involvement.

INTRODUCTION

The number of older motorcyclists killed or injured in crashes has increased in the last decade in many developed countries including the United States (National Center for Statistics and Analysis Research and Development, 2005; Stutts, Foss & Svoboda, 2004), Great Britain (Sexton, Broughton, Elliot & Maycock, 2004) and Australia (ATSB, 2006). In some countries, this increase has been the main contributor to an overall rise in rider fatalities.

In Australia, the number of motorcyclist (rider and pillion) fatalities fell from a high of 299 in 1989 to 175 in 1997 and has since increased to 233 in 2005. There has been a decrease in the number of motorcyclists aged under 25 killed and an increase in the number of riders aged over 25 killed since 1991. The percentage of riders killed who were aged over 25 increased from 49% in 1991 to 70% in 2005 (ATSB, 2006).

This pattern is not confined to fatalities. In the State of Victoria, as in other jurisdictions, the involvement of "older" motorcyclists in crashes has increased since 1990. The number of riders in crashes aged 30 and over more than doubled from 501 in 1991 to 1,120 in 2003. In contrast, the number of riders in crashes aged under 30 more than halved from 1,353 in 1991 to 663 in 2003. Riders aged 30 and over comprised 26.8% of riders in crashes in 1991 and this increased to 63.2% in 2003.

While the numbers of older riders in crashes have increased, older riders have lower crash rates per licence held (Haworth, Mulvihill & Symmons, 2002) and per distance travelled (ATSB, 2002). Thus, there appear to be two main rider groups of concern; riders aged under 25 who continue to be over-represented in casualty crash rates, and older riders aged 30-54 who are the fastest growing group among serious crashes.

The trends in motorcycle involvement in crashes have mirrored changes in motorcycle registration and rider licensing data. In Australia, the number of motorcycles registered increased by 18.7% from 1999 to 2004 (ABS, 2005), showing the strongest growth of any vehicle type in Australia. There is relatively less information available regarding the age profile of riders. In New South Wales, the number of motorcycles registered to people aged 40 and over increased by 57% between 1995 and 2000, while the number of motorcycles registered to people aged under 25 years decreased by 33% (de Rome and Stanford, 2002). At the same time, the number of licences held by older riders also increased.

Motorcycle Rider Training

Rider training is one of the most popular measures aiming to reduce motorcycle crashes.
While there is little empirical evidence to demonstrate improvements in motorcycle safety as a result of training, training is encouraged and is compulsory in some jurisdictions. An international review concluded that voluntary motorcycle training programs do not reduce crash risk (TOI, 2003). On the contrary, these programs seem to increase crash risk. This may be due, in part, to the increased confidence felt by many riders who have completed training, despite minimal improvements in rider skill. These riders may ride more often or take more risks in situations where they lack the skills to safely avoid a crash.

The same review concluded that compulsory training through licensing programs produces a weak but consistent reduction in crashes (TOI, 2003). This may result from reductions in the amount of riding (exposure reduction) or by riding more safely (risk reduction). It is not always possible to neatly separate these effects. For example, one of the underlying principles of graduated licensing is to reduce exposure in high-risk situations.

In a recent review of motorcycle licensing and training, Haworth and Mulvihill (2005) asserted that there are some key deficiencies in most current training programs that may account for the apparent lack of overall effectiveness. These include a lack of attention to higher order cognitive factors such as hazard perception, attitudes and motivation as well as insufficient duration of training (see Haworth & Mulvihill, 2005 for a full review).

Recent changes in the demographics of riders lead us to question whether the results of earlier evaluations of rider training remain valid. Traditionally, most riders undertaking training were young, with little car driving experience. Thus, the published evaluations relate to a different age profile of trainees to that now presenting to training. The effectiveness of training has not been studied as a function of rider age. There are a number of issues that cause us to wonder if the effects of training are different for older riders, compared with younger riders.

Firstly, older riders bring more car driving experience (and possibly more riding experience) to the training situation and arguably a lower propensity to take risks (Clarke, Ward, Truman, & Bartle, 2004). Alternatively, they may bring a range of bad habits and preconceived ideas to the training situation which may inhibit their learning.

Secondly, many States (such as Queensland) provide exemptions from the graduated licensing requirements for older novice riders who hold full car licences. Thus, older novice riders are moving from training straight into riding without restrictions on engine size (or power to weight ratio) or lower travel speeds or lower BAC limits or restrictions on carriage of pillions. This could potentially increase the crash risk or crash severity for newly trained and licensed older riders (compared to younger riders) and at least appear to reduce the benefits of training for the older riders.

Thirdly, most of the published evaluations of training were based on large numbers of riders taking learner or licence courses. Many older riders are returning riders, who already have motorcycle licences and therefore, if they take training courses, are taking refresher or advanced courses. Some of these riders may have not undertaken training for many years and some may never have received formal training at all.

Fourthly, many older riders may not ride often enough to practice and improve the skills taught in training. Earlier analyses of the survey data showed that half of the older riders rode less than 100kms per week (Mulvihill & Haworth, 2005a). Previous studies suggest that riders who ride infrequently are at greater risk of crashing (Harrison & Christie, 2003). Paradoxically, whilst new riders who have just completed licensing training and need to gather experience, increased on-road exposure particularly places them at high risk as well (Mulvihill & Haworth, 2005a).

Keeping these issues in mind, training is only one measure that may affect motorcycle crash occurrence or crash severity. A range of further measures aimed at riders, other road users, vehicle design, the road environment, and injury response/treatment can all have influence on overall rider safety. Therefore, it is difficult to isolate at any given time the pure effects of training.

Requirements for motorcycle training (and licensing systems) differ across Australia (see Haworth & Mulvihill, 2005). This paper will focus on riders from Victoria, New South Wales and Queensland, because they comprised the largest numbers of respondents in the survey. Training has been compulsory to gain a motorcycle learner permit or a licence in NSW (except for some riders in rural or remote areas) since 1989 and has been effectively compulsory in Victoria since at least 1993. In Queensland there is no requirement for training to obtain a motorcycle learner permit and competency-based training and assessment (the Q-RIDE system) has been optional to gain a motorcycle licence since August 2001. In each State, many older riders gained their licence before the current requirements were put in place and so were not required to complete a training course.

Clearly the issues associated with measuring the effectiveness of rider training for older riders are complex. This paper seeks to contribute to answering this question by presenting new analyses of data related to training history and crash outcome that were collected as part of a survey of older rider crash characteristics and countermeasures conducted in 2005. Preliminary analyses of a wide range of variables collected in this survey were presented in Mulvihill and Haworth (2005a). The present study aims to investigate the influence of training on crash involvement for older riders with particular reference to when training was last undertaken (if at all). Where training occurred many years ago, it is less likely to have had an effect on crash involvement than when it occurred closer in time to the period when crash involvement was measured (2001-2005 in this study).

METHOD

An on-line survey of Australian motorcycle riders aged 25 and over was undertaken to explore potential contributors to crash risk such as attitudes, personal characteristics, self-reported riding behaviours and level of experience and training. The rationale for choosing this method and its advantages and disadvantages are discussed elsewhere (Mulvihill & Haworth, 2005b). A detailed description of the methodology is provided in Mulvihill and Haworth (2005a).

RESULTS

Characteristics of respondents

Of the 1,500 valid questionnaires received, 86.7% were from male riders. The largest age group was 45-54 years old (32.9%), with 25.6% of respondents aged 35 to 44, 22.9% aged 25 to 34 and 16.4% aged 55 and over. Most of the respondents were residents of Victoria (45%), with 28% from New South Wales and 13% from Queensland.

Overall, 92.7% of respondents held a full motorcycle licence, with 2.4% holding a learner permit and 3.7% holding a provisional or restricted licence. Of the riders who held a full licence, 12.2% had obtained their licence before 1970, 25.3% in 1970-79, 17.9% in 1980-89, 21.9% in 1990-99 and 22.7% in 2000 to 2005.

Training history

Riders were asked whether they had ever undertaken a motorcycle rider training course, and if so, the type of course they had most recently completed and the year in which that occurred. Overall, 68.5% of fully-licensed riders had undertaken a motorcycle rider training course at some time (see Table 1).

The percentage of riders who had completed a training course was lower for riders licensed before 1990 (51.8% to 57.1%) than after 1990 (84.7% to 90.1%).

Table 1 shows that more than half of the most recent training courses were completed in 2001-05 (51.8%). While this was most evident for riders who obtained their full licence in 2000-2005 (82.8%), between a third and a half of riders licensed before 2000 also completed their most recent training course in 2001-2005 (31.5% to 47.4%).

Table 1. Summary of numbers and percentages of riders who had completed training as a function of year of their most recent training course and year their full motorcycle licence was obtained.

	Year obtained full licence					
	pre 1970	1970-1979	1980-1989	1990-1999	2000-2005	Total
Year of most recent training course						
pre-2001	48	88	75	160	28	399
2001-2005	46	82	57	82	226	493
% trained in 2001-05	*47.4*	*44.6*	*41.3*	*31.5*	*82.8*	*51.8*
Year unknown	3	14	6	18	19	60
Total trained	97	184	138	260	273	952
Total not trained	73	171	114	47	30	435
% trained	*57.1*	*51.8*	*54.8*	*84.7*	*90.1*	*68.5*
Total number of riders	170	355	252	307	303	1391*

* includes 4 unknown

Given the current and past differences in requirements for training in NSW, Queensland and Victoria, an attempt was made to compare the training histories of riders from these three States. The analyses were conducted based on reported current State of residence because the questionnaire did not ask about State of initial licensing.

There was little difference among the States in the percentage of fully-licensed riders who had completed a training course at some time: 69.7% for NSW, 65.5% for Queensland and 71.6% for Victoria. In each State, the percentage who had undertaken training was highest for riders who obtained their full licence after 1990 (see Figure 1).

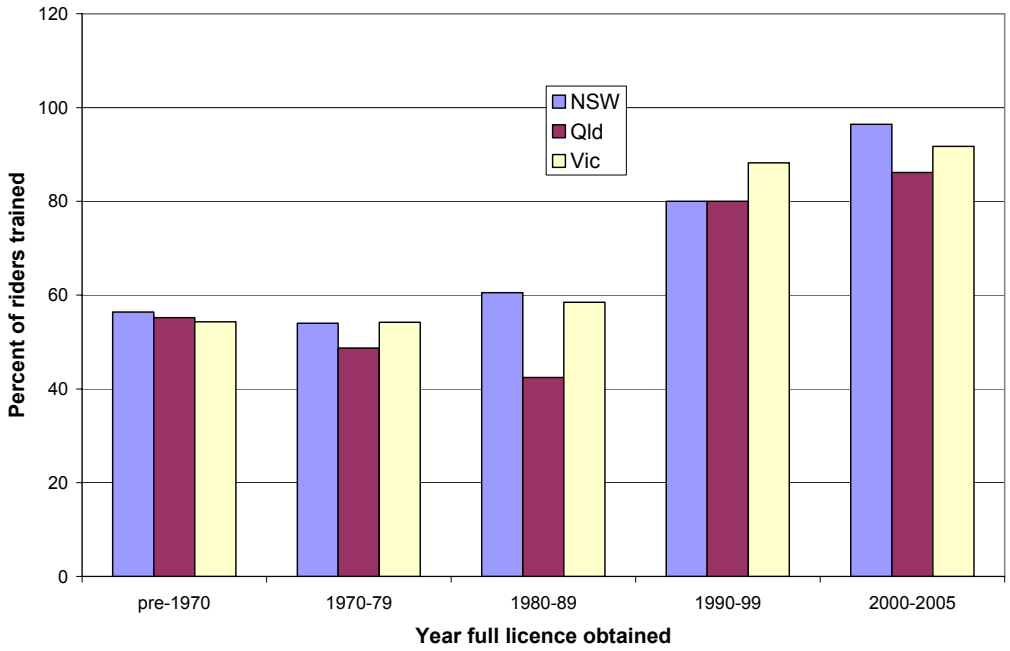

Figure 1. *Percent of riders in the survey from each state who had completed training according to the year they obtained their full motorcycle licence.*

Riders were asked to describe the most recent rider training course they had completed. The options provided were "learner", "licence", "advanced", "off-road", "refresher", and "other". The last course that had most commonly been undertaken by fully-licensed riders was an advanced course (33.3% of riders). A licence course was the last course for 16.2% of riders, with a refresher course taken most recently by 6.3% of riders and learner course by 4.5% of riders. Among riders who had completed training, the mix of types of training did not differ significantly for riders from New South Wales, Queensland and Victoria ($\chi^2(10)=16.7$, $p>.05$, see Figure 2).

Crash involvement

Riders were asked how many crashes they had been involved in while riding their motorcycles on Australian roads in the last five years. They were asked to include only those crashes in which someone was hurt, the Police were called, or a vehicle was damaged to the extent that it had to be taken away. Overall, 445 riders (about 30%) reported that they had been involved in at least one crash. About 75% of these riders had been involved in one crash, 20% in two crashes, 4% in three crashes and 2% in four crashes.

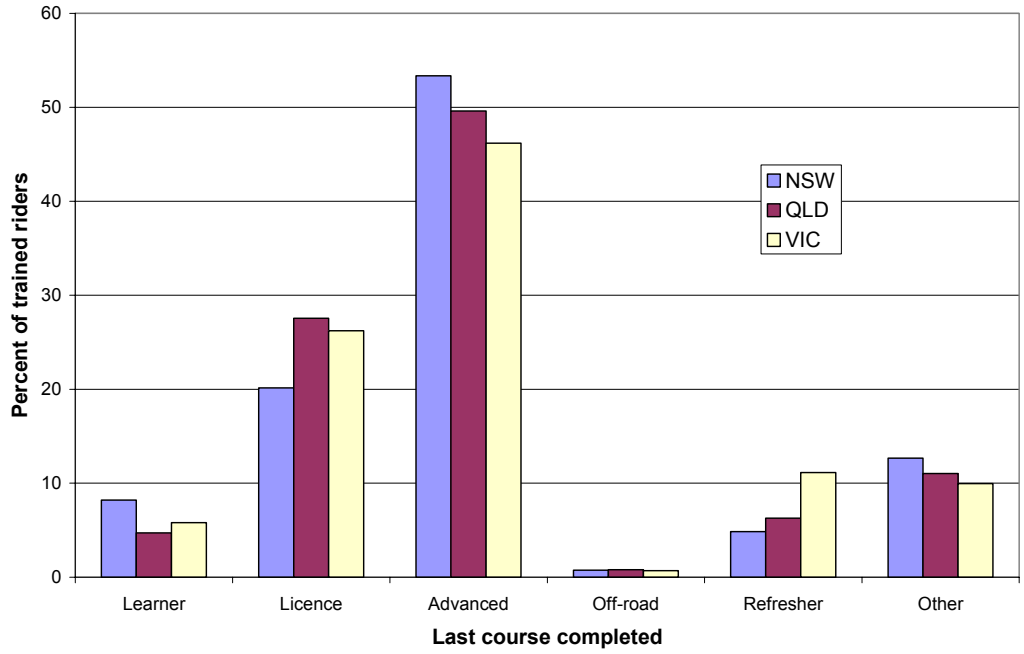

Figure 2. Percent of trained riders from NSW, Queensland and Victoria who had completed each type of training course.

For those riders who had been involved in a crash, the severity of the most recent crash was measured in terms of injuries sustained to the rider and the damage to the rider's motorcycle. Riders most commonly suffered slight injuries (cuts and bruises) (46% of crashes). About 19% of riders suffered no injuries at all. About 20% of riders suffered serious injuries that required hospital emergency treatment and 16% suffered serious injuries that required admission to hospital.

Over half of the crashes were single vehicle (54%) (involving the motorcycle only). New riders appeared to be over-represented in single vehicle crashes (61%) compared to returned riders (55%) and continuing riders (51%), although these differences were not significant ($\chi^2(2)= 2.6$, $p>.05$).

Relationship between crash involvement and training history

In order to assess whether training reduced crash risk or severity, data were first excluded where the most recent training course occurred after the most recent crash (55 riders) or in the same year (49 riders). This procedure was conservative and may have incorrectly removed some eligible riders.

It may be that only recent training courses are likely to have a measurable effect on crash involvement. For this reason, the analyses compare the crash involvement of riders who have never undertaken training, those who have undertaken training since 1996 and those whose most recent training course was before then.

The analysis involved a multivariate logistic regression approach to control for the importance of other potential confounding influences on crash risk. Earlier studies have shown that crash risk increases with amount of riding and decreases with age of the rider (Mulvihill & Haworth, 2005a). While crash risk is often found to decrease with experience (as measured by years since licensing), this variable is so closely linked with age that it was not possible to include both in the analysis.

The comparisons of crash and non-crash involved riders and the results of the multivariate logistic regression are summarised in Table 2. Given that training may potentially have a larger effect on single vehicle crashes since their occurrence is relatively less affected by the actions of other road users, the analyses were repeated separately for single and multi-vehicle crashes.

Table 2. Comparisons of characteristics of crash and non-crash involved riders. Odds ratios and confidence intervals from multivariate logistic regression analysis.

Characteristic	Crash-involved	Non-crash involved	OR	95% CI	p value
ALL CRASHES					
Training course					
None	34.0%	34.9%			
Before 1996	16.5%	15.3%	1.194	0.877-1.624	.260
1996 or later	49.5%	49.8%	1.323	0.892-1.962	.163
Distance ridden per week (km)					
Less than 300	77.5%	85.0%			
300 km or more	22.5%	15.0%	1.660	1.192-2.312	.003
Mean age (years)	41.6	45.5	0.985	0.971-0.974	.001
SINGLE VEHICLE CRASHES					
Training course					
None	37.2%	35.0%			
Before 1996	12.4%	16.2%	1.049	0.713-1.544	.809
1996 or later	50.3%	48.8%	0.753	0.430-1.319	.320
Distance ridden per week (km)					
Less than 300	80.4%	83.0%			
300 km or more	19.6%	17.0%	1.249	0.808-1.929	.315
Mean age (years)	43.0	44.7	0.991	0.976-1.007	.259
MULTI-VEHICLE CRASHES					
Training course					
None	30.8%	35.9%			
Before 1996	20.3%	15.1%	1.043	0.683-1.593	.845
1996 or later	49.0%	49.0%	1.693	1.039-2.757	.035
Distance ridden per week (km)					
Less than 300	75.3%	83.7%			
300 km or more	24.7%	16.3%	1.583	1.032-2.426	.035
Mean age (years)	40.2	45.0	0.962	0.945-0.979	.001

There was no clear relationship between undertaking a training course since 1996, before 1996 and not at all and involvement in crashes overall or in single vehicle crashes. The only significant finding (at the 5% level) was an increase in the risk of involvement in a multi-vehicle crash for riders trained since 1996 compared to untrained riders.

Crash risk was strongly related to distance ridden per week, with riders who rode 300 kms per week or more being at a 66% greater risk of crashes overall and a 58% greater risk of multi-vehicle crashes than riders who rode less than 300 kms per week. Crash risk decreased with increasing age, with a reduction of about 1.5% for overall crashes and 3.8% for multi-vehicle crashes for each year of age.

DISCUSSION

The survey data showed that almost 70% of fully-licensed riders aged over 25 had undertaken some form of training. More than half of the riders licensed before 1990 (when training was unlikely to be compulsory) had completed a training course and about half of these had completed a training course in 2001-05. Thus, for many older riders their most recent experience of training was a post-licence course, rather than a learner or licence course. This supports the concern raised earlier in this paper regarding the likely applicability of the results of studies of learner and licence training to older riders.

It is useful to consider whether the high prevalence of training among the older riders who responded to this survey is representative of older riders as a whole. Certainly we know that many older motorcycle licence holders are not active riders (Haworth et al., 2002) and thus it is likely that the prevalence of training in our sample of active older riders would be higher than among all licensed older riders. An examination of the characteristics of respondents shows that there is an over-representation of riders from Victoria in the sample, reflecting the degree of local interest in the project and the recruitment of riders by means of an article in the Victorian motoring club magazine. Given that learner and licence training has been effectively compulsory in Victoria since at least 1993, this might boost the prevalence of training among the sample. However, the data showed that the prevalence of training was very similar for riders (currently resident) in NSW, Queensland and Victoria, so the over-sampling of Victorian riders is unlikely to account for the high prevalence of training (and particularly since advanced training, not learner licence training was the most frequent form of most recent training course).

A greater concern for the representativeness of the data collected is the extent to which the survey attracted motorcycling enthusiasts. The larger proportion of continuing riders in the current survey (compared with Haworth et al., 2002), many of whom are enthusiasts, may also reflect the effect of advertising the survey in motorcycle magazines. Enthusiasts are probably more likely to undertake training, particularly post-licence training. Nevertheless, comparisons of the demographic characteristics of respondents in this study and those of Haworth et al. (2002), which had a response rate of 49% to a mail-out to motorcycle licence holders, suggest that the sample in the current study was of a similar level of representativeness to that of earlier studies.

The percentages of riders who had completed training courses and the types of courses completed were similar for riders resident in Victoria, New South Wales and Queensland, despite the current differences in the requirements for training to obtain a motorcycle licence in these three jurisdictions. The lack of difference can be largely ascribed to advanced training (which is voluntary) being the most common form of training course most recently completed by respondents from each jurisdiction. Secondly, many of the respondents obtained their motorcycle licence before training became compulsory in New South Wales or more widespread in Victoria and Queensland.

An attempt was made to assess the relationship between crash involvement in the past five years and training history. While earlier preliminary analyses reported in Mulvihill and Haworth (2005a) had shown that crash involved riders were more likely to have undertaken training than non-crash involved riders, this effect disappeared when riders whose most recent crash had occurred in the same year or prior to the year of their most recent training course were removed from the sample. Although the relationship between training and crash involvement should conceptually be stronger for single vehicle crashes (because there is no contribution from another road user), there was no significant relationship between training and the most recent crash in the last five years being a single vehicle crash. Conversely, the only evidence was for an increase in the risk of multi-vehicle crash involvement for riders trained since 1996.

Given that the effects of training may not be permanent, the effect of recency of training on crash involvement was investigated. Again, there was no significant relationship between crash involvement (all crashes, single vehicle or multi-vehicle crashes) in the past five years and whether training occurred since 1996, before 1996 or not at all.

While it is tempting to conclude that this result is evidence of no effect of training on crash risk, there are a number of constraints to the analysis that should be considered. In terms of the analyses of the recency of training, the time periods used may not have been appropriate. It may be that training does reduce crash involvement but only for 6-12 months, rather than the period of up to 10 years as used in the analysis.

In addition to the issues related to the analysis of the effect of recency of training on crash involvement, there are wider issues that relate to the general analysis of the relationship between training and crash involvement. Firstly, the analysis is constrained by not knowing the content of the training that riders have undertaken and the wide variety of courses that have been completed. Some courses may have positive effects on crash involvement, others may have no effect or even a negative effect.

This analysis examined the crash involvement of current riders. Therefore it was unable to measure some potential benefits of compulsory training in terms of exposure reduction – making learning to ride less attractive by increasing the expense associated with obtaining a licence, riders being discouraged from further riding by their experiences of rider training (finding out that riding is "not for them").

CONCLUSIONS

Many of the published evaluations of rider training as a method for reducing crash occurrence and severity were undertaken when most trainees were young novice riders undertaking learner or licence courses. The results of this survey show that many recent trainees are older riders completing advanced courses and so the results of earlier evaluations may no longer be relevant. Difficulties in measuring the effects of training remain. The results of the current study are similar to those of the earlier ones in that they suggest that training is not the strongest predictor of crash involvement and that other factors such as distance ridden and age (or perhaps years of licensing) are more important.

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