

Impact of a direct mail safety campaign for motorcyclists

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Abstract

Motorcycle crashes commonly occur on curved roads on recreational riding routes in non-urban areas. In 2007, the NSW RTA conducted a safe cornering campaign centred on an information brochure that was mailed directly to all registered motorcycle owners in NSW. To evaluate this direct mail approach, motorcyclists were surveyed at popular rest stops along recreational ride routes before (n=213) and after (n=397) the mail out. Surveys addressed riders' knowledge of safe cornering practices, their beliefs about cornering and speed, and their usual cornering behaviours. Surveys conducted after the mail out also assessed riders' reactions to the brochure itself. Riders evaluated the mail out positively in terms of its design and the presentation of information, but did not generally consider that it contained new information. Consistent with this, responses to the cornering knowledge questions in the pre campaign survey were answered correctly in the majority of cases. Nonetheless, estimates of cornering crash frequency, and identification of crash circumstances, and the safest ride line for cornering were all higher among riders who had read the mail out. Just under 20% of riders reported that they had changed their cornering behaviour after reading the mail out and there was a modest increase (9%) in the percentage of riders who reported using the safe ride line. Although age differences in knowledge tended to favour younger riders, suggesting that recent training and licensing tests may have had an impact, younger riders were overrepresented among those who knew but did not use the safest cornering line. A direct mail out strategy can be an acceptable and effective means of communicating safety information to riders, but other approaches targeting age-relevant motivational factors may also be worth investigating.

Keywords

Motorcycle, Safety Campaign, Cornering, Evaluation

Introduction

NSW Roads and Traffic Authority (RTA) crash data (2002-2006 Traffic Accident Database System) show that 51% of fatal motorcyclist crashes and 30% of all motorcycle-involved crashes occurred on curved roads. Crashes on recreational ride routes (rural roads, on roads with higher speed limits (over 60 kmh), on two-way undivided roads and during daylight hours) were relatively more common on curves than on straight roads. Although only 6.6% of motorcycle riders involved in a crash on a curve were known to be travelling above the posted speed limit with another 1.1% described by police recorders as travelling at 'excessive speed', 64% of riders were judged to be riding too fast for the conditions. These crash data highlight the potential gains in road safety of promoting safer proactive and defensive cornering practices among recreational motorcyclists and prompted the NSW RTA to undertake a safe cornering campaign.

Traditional methods of communicating safety information to motorcyclists such as magazine advertisements, radio coverage and internet sites each reach sections of the riding population [1] but there is no guarantee of broad coverage. For the safe cornering campaign a method of mass communication not previously used with riders was trialled. A safe cornering information brochure was mailed directly to all registered motorcycle owners in NSW and to every business with a motorcycle registration. Theoretically, the direct mail approach has the potential to reach every registered rider. The brochure emphasised riding techniques and strategies because previous research [1,2] and preliminary focus groups suggested that skill or technique based messages were more acceptable and more memorable for riders than, for example, emotional appeals. The brochure was designed particularly to appeal to 26-39 yr olds who comprise the largest group of riders (38%) involved in crashes. Four main messages were emphasised: safe braking technique including early speed reduction, correct gearing, a road position through the corner ensuring the longest view and avoiding the head on zone (i.e., a wide entry and tight exit), and riding posture with head up and chin pointing through the corner.

To evaluate the impact and acceptability of the direct mail brochure, motorcyclists were surveyed before and after the mail out. Two primary research questions were addressed: 1) was the campaign brochure widely read and assessed positively by riders, and 2) did the brochure affect riders' knowledge and reported use of safe cornering techniques and their beliefs about cornering and speed.

Methods

A before-after study design was used. Independent groups of riders were surveyed before (Pre) and after (Post) the mail out of the safe cornering brochure. Surveys contained campaign-relevant questions about cornering as well as control questions about following distances which were used to check that group differences in responding were specific to the brochure content.

Pre surveys were conducted on weekends from 3-11 November, 2007. Brochures were then mailed between 17-23 November, and Post surveys were conducted on weekends from 1-9 December.

Male riders were recruited into a survey about safe riding at popular rest stops on recreational ride routes to the north and south of Sydney. Men were targeted because they comprise 93% of the motorcyclists involved in crashes. Surveys were conducted on the spot either as an interview (23%) or as a self-completed questionnaire (77%) at the rider's discretion. The overall response rate was 84%, with 213 riders participating at Pre and 397 riders participating at Post. The participating riders were classified into four age ranges: 17-25 (13%), 26-39 (35%), 40-49 (31%) and 50+ years (21%). On average they had held motorcycle licences for 16.3 years (SD=13.1, range 0-58 years).

Pre and Post surveys included questions on: 1) Rider demographic characteristics (age, NSW registration status, number of motorcycles, current motorcycle make, model and size, licence tenure, type and frequency of riding); 2) Knowledge and practice of safe following distances and knowledge of rear end collision circumstances (not covered in the brochure); 3) Knowledge and practice of safe cornering techniques and knowledge of cornering crash circumstances (covered in the brochure). Questions included knowledge of the safest ride line through a corner, the best time to brake and gear down and the best head posture. Riders were also asked to describe their technique on a corner that day and to select their usual cornering line; 4) Four questions tapped beliefs about cornering and speed. Specifically, riders were asked how much they agreed or disagreed on a 5-point scale with the statements: 'Riding through tight corners and bends is one situation where I take risks on my motorcycle', 'I sometimes approach bends and curves too quickly and have to change course or brake harder', 'I feel that I am highly capable of cornering my motorcycle at speed' and 'The more experienced I get the faster I'll be able to take corners and bends'. Post surveys, only, included questions at the end asking riders to confirm receipt of the brochure and to give their assessment of it.

Rider groups were compared statistically using Chi Square tests and ANOVA. Post hoc multiple comparisons used Bonferroni adjusted alpha levels.

Results and discussion

Reach of mail out

At Post, 73% of the riders who should have received a brochure (because they held a NSW motorcycle registration) remembered receiving one and 96% of these people, read all or part of it. This level of recall compares favourably with other communication strategies. De Rome and Brandon (2007) reported that only motorcycle magazines had a greater reach among riders (80%) but magazines were not commonly identified as the source of memorable safety messages in their rider sample (14%).

Post participants in the current study were classified into two groups for analysis on the basis of their exposure to the brochure. The 'Brochure' group were Post riders who received and read at least part of the brochure. The 'No Brochure' group were Post riders who did not receive or did not read the brochure at all.

Pre, No Brochure and Brochure groups did not differ significantly on demographic factors with the exception of minor differences in bike make on the survey day ($p=0.007$) and age ($p=0.002$). Hondas were relatively more common in the Brochure group whereas Suzukis were relatively more common and Kawasakis less common in No Brochure group. Pre and Post participants showed similar age distributions overall but the two Post subgroups differed. This was largely a function of the relatively high number of 40-49 year olds who did not recall having received the brochure. These riders comprised 42% of the No Brochure group but only 24% of Brochure group. The reason for this difference is not clear.

Self reported impact of brochure

The majority of Brochure group riders' assessed the brochure design and the presentation of information positively, but only 11% felt they had learned new information from it (Table 1). Consistent with the emphasis of the brochure on riding technique, only a minority of riders reported that it had a strong emotional impact on them.

Assessment of brochure (n=263)	Response	%
Design:		
Picture on front got my attention	Yes	87
Fold-out design got my attention	Yes	64
I paid it little attention	No	62
Presentation of information		
Was confusing	No	82
Was realistic	Yes	80
Was relevant to me	Yes	76
Diagrams helped me understand	Yes	72
Emotional impact		
Imagined how the pictured rider felt	Yes	53
Had a strong emotional impact	Yes	20
Information value:		
Made me realize the serious consequences of corner crashes	Yes	56
Told me something I did not know	Yes	11

Table 1: Riders' assessments of the brochure.

The reported effect of the brochure on behaviour was typically to prompt riders to think about the possibility of corner crashes (72%) and their own cornering style (63%), and, to a lesser extent, to talk about the brochure with others (48%). One fifth (20%) reported changing their cornering behaviour, but few followed up the web link (7%) provided in the brochure.

Comparisons of rider groups

As expected, the rider groups did not generally differ in their responses to the control questions about a rider safety issue not covered in the cornering brochure. Knowledge about following distances and reports of usual following distances did not differ between Pre, No Brochure and Brochure groups. Similarly, knowledge about the frequency and circumstances of rear-end collisions did not vary between the groups. There was one exception. A greater percentage of Brochure group participants than Pre and No Brochure participants identified urban locations as the site of most rear-end collisions involving motorcycles (85% vs 77% and 74%, respectively, $p=0.03$). It is not clear why the single issue of crash location should vary between the groups, but it seems unlikely that if a more general difference existed between the groups in their knowledge about rider safety issues it would be reflected in this question alone.

Beliefs about cornering and speed did not differ significantly between Pre, No Brochure and Brochure groups indicating that the brochure did not affect riders' views on these issues.

Consistent with the reported effects of the brochure on behaviour, a somewhat higher percentage of Brochure riders (61%) than either Pre (52%) or No Brochure (46%) riders reported that they rode the cornering line recommended in the brochure ($p=0.01$). This finding suggests an effect of the brochure.

Similarly, Brochure group riders were more likely than Pre and No Brochure riders to describe using a wide entry ($p=0.001$) and tight exit ($p<0.001$) while cornering that day. Early braking, gearing and posture were not differentially reported by the groups.

With regard to riders' knowledge, typical corner crash circumstances were correctly identified by over 60% of the Pre participants (Table 2) for number of vehicles involved, road surface type and time of day. These results indicate a reasonably knowledgeable population at baseline. However, the majority of riders at Pre incorrectly identified wet roads as typical of cornering crashes, perhaps confusing crash frequency with crash risk. The proportion of correct answers for road moisture, time of day and road surface was significantly higher among Brochure riders than among Pre or No Brochure riders. This suggests an impact of the brochure on crash knowledge. Similarly, Brochure riders estimated that a higher percentage of fatal crashes occurred on corners ($M=64,SD=23$) than Pre riders ($M=53,SD=23$) and, marginally, No Brochure riders ($M=58,SD=24$). In this case, exposure to the brochure was associated with overestimates of the real contribution of corners to motorcycle crashes. It is likely that Brochure riders remembered the brochure point that a high proportion of fatal crashes occur on corners without remembering the actual proportion.

Corner crash circumstances (%)	Correct answer	Incorrect answer	Nil/multiple answers
Number of vehicles [#]	1	> 1	
All participants (n=593)	64.1	20.2	15.7
Road moisture ^{##}	Dry	Wet	
Pre (n=213)	37.6	50.7	11.7
No Brochure (n=118)	33.9	56.8	9.3
Brochure (n=262)	46.6	38.6	14.9
Time of day ^{##}	Day	Night	
Pre (n=213)	62.0	16.4	21.6
No Brochure (n=118)	63.6	14.4	22.0
Brochure (n=262)	76.0	8.4	15.7
Road surface ^{##}	Sealed	Unsealed	
Pre (n=213)	62.9	18.8	18.3
No Brochure (n=118)	60.2	17.8	22.0
Brochure (n=262)	72.9	10.7	16.4

[#] no group differences; ^{##} group differences $p<0.05$; Chi Square test

Table 2: Knowledge of cornering crash circumstances.

The majority of riders at Pre correctly identified safe cornering practices (Table 3). Nonetheless, Brochure riders were more likely than Pre or No Brochure riders to correctly identify the safest ride line through left and right corners, suggesting a positive impact of the brochure on this area of knowledge. In addition, riders in the Brochure group who reported that the brochure contained new information or who reported changing their cornering behaviour were more likely than other Brochure riders to freely recall information from the brochure about keeping one's head or chin up as well as safe ride lines. That is, the "head up" message was usefully communicated to a subset of riders.

Safe cornering practices (%)	Correctly identified
Safest line for left corner^{##}	
Pre (n=204)	63
No Brochure (n=108)	59
Brochure (n=256)	73
Safest line for right corner^{##}	
Pre (n=210)	71
No Brochure (n=117)	66
Brochure (n=262)	80
Gear down before corner[#] (n=605)	94
Brake before corner[#] (n=605)	93
Keep head up[#] (n=605)	89
Head on zone[#] (n=610)	68
Ease off brakes gently when entering[#] (n=605)	61

[#] no group differences; ^{##} group differences $p < 0.01$; Chi Square test

Table 3: Knowledge of safe cornering practices

Overall, the comparison of rider groups suggests that the brochure was effective in communicating information about safe ride lines, in particular. Other aspects of safe cornering were not significantly affected, perhaps because Pre (baseline) levels of knowledge were very high.

Effects of age

Although the brochure aimed to appeal to 26-39 year old riders in particular, there was no evidence that differences observed between Pre, No Brochure and Brochure groups varied with age. That is, the impact of the brochure was similar across age groups.

Regardless of rider group, 17-25 year old riders were more likely than older riders to incorrectly identify unsealed roads as a common corner crash circumstance ($p=0.007$). This may reflect a greater interest, although not a greater participation ($p > 0.05$), in off-road riding among younger riders. More importantly, however, correct identification of the safest ride line and keeping one's head up were inversely related to age ($p=0.05$ and $p=0.04$, respectively). The youngest riders were correct more often than the older riders. This may reflect the nature and recency of licensing training and testing for younger riders.

Despite the knowledge advantage of young riders, they were not more likely than other age groups to both know and use the safe cornering line. Indeed, the percentage of riders who knew and usually used the safe cornering line varied little (between 46% and 50%) across the four age groups. In contrast, 17-25 year old riders were more likely than the other age groups to know but not use the safest line ($p=0.03$). This suggests that young riders' behaviour is shaped by motivational or attitudinal factors (as opposed to a lack of knowledge or skill) more often than older riders' behaviour. In support of this conclusion, the current study confirmed a relationship between age and reported risk taking on tight corners such that younger riders were more likely than older riders to agree that they engaged in risky behaviour ($p < 0.001$). Watson et al. [2] have recently identified two motivational factors, aggression and sensation seeking, that predict reported volitional risky behaviours (such as pushing one's limits and extreme speeds) in a sample of Queensland riders. Further research could usefully examine the role played by these factors in the knowledge-behaviour mismatch among young riders and would help to guide the development of more effective safety interventions.

The knowledge-behaviour mismatch results for the youngest riders contrast sharply with those for the oldest riders (50+yr) who were more likely than other age groups to neither know nor use the recommended cornering line. Taking these results at face value, information-based strategies would appear to have greater potential for altering the cornering behaviour of older riders, whereas other strategies targeting attitudes and beliefs may be required for young riders. However, this study showed no differential effect of information on the reported behaviour of older riders. Whether the additional use of different media or information formats would be more successful with this group remains to be tested.

Certainly de Rome and Brandon [1] identified traditional media (print, magazines, TV, radio) as popular information sources for older riders although their influence on safe practice has not been established. The possibility of resistance to new information in this group should also be investigated.

The study also found age-related differences in rider reports about inappropriate approach speed to corners ($p=0.005$), the belief in own competence to corner at speed ($p=0.055$), and the belief that greater experience will allow faster cornering ($p=0.001$). In each case, 17-25 year olds differed from older riders. Young riders were more likely to admit to inappropriate cornering speed, were less committal about their own cornering competence at speed and were more likely to believe that experience would permit faster cornering. These responses may partly reflect real differences in bike handling skills but also support the notion that young riders are particularly prone to pushing their limits either for fun or as a means, widely accepted among riders, of increasing their skill [2].

Conclusions

A direct mail brochure that focussed on safe-cornering information and techniques was received and read by around 70% of motorcycle riders and was assessed positively by them. The brochure appeared to produce modest increases in knowledge and reported use of safe cornering lines among those who received and read it. Other aspects of safe cornering such as early braking did not show comparable changes probably because levels of knowledge were very high before the campaign. Age differences in knowledge, behaviour and beliefs suggest that supplementary strategies targeting motivations and attitudinal factors may increase campaign effectiveness.

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