The Older Motorcyclist

Road Safety Research Report No. 55

The Older Motorcyclist

Samantha Jamson,
Kathryn Chorlton
and Mark Conner
University of Leeds
January 2005

Department for Transport: London

CONTENTS

LIST OF FIGURES

LIST OF TABLES

EXECUTIVE SUMMARY

The 'Older Motorcyclist' project was funded by the Department for Transport (DfT) in a response to the increasing number of motorcycling accidents involving riders over the age of 30. The project aimed to collect information to provide a broad picture of the older motorcyclists' activities in terms of exposure, experience, vehicle characteristics, riding history and attitudes to risk.

The study involved four stages: a literature review, a survey examining ownership characteristics completed by 1009 riders, a survey examining psychological determinants of risky riding behaviours completed by 4929 riders and a simple accident analysis using STATS19 data.

The first survey suggested that there has been a change in the motorcycling population since the 1950s. The age at which riders gain their motorcycling licence (and purchase their first bike) has changed steadily over the years: those who gain their licence nowadays are, on average, 13 years older than their counterparts in the 1970s. Thus the older motorcyclist certainly does exist and, in fact, makes up a large proportion of current riders. The ways in which motorcyclists build up their experience has also changed – recent recruits to motorcycling tend to move up through the motorcycle ranks (in terms of engine size) much more quickly than their more established counterparts did. Thus we have a cohort of riders who have progressed to large capacity machines relatively quickly, without the same build up of skill that was previously allowed for. Riders today more often quote reasons of 'styling' and 'top speed' for purchasing their machines.

Simply grouping motorcyclists into age categories was thought to be less useful than taking into account experience and exposure. These two latter variables allowed us firstly to categorise riders based on whether they had taken breaks from motorcycling or were taking up motorcycling at a later age, and secondly took into account the types of riding they engaged in. As a result, half of the sample were categorised as new or returning riders, with the latter having the highest mean age. This may suggest that the UK roads currently have a significant proportion of motorcyclists who could either be using newly learned skills or be relying on skills that were developed some years ago and which may have subsequently degraded through non-use. However, without further evidence regarding the development and/ or loss of motorcycling skills, it is difficult to determine what impact this may have on road safety. The results of the survey also suggest that it is more likely to be long-term riders who attend voluntary courses, thus suggesting there is scope for returning riders to be encouraged to participate in further training.

This survey also found evidence for the shift in the nature of motorcycling, in that it has, for some, become a leisure activity, with the motorcycle being more of an accessory than a means of transport. Riders were categorised as being commuters,

leisure riders or a combination of both. Whilst 85% of the riders engaged in leisure riding, there was a high number of motorcyclists who claimed to engage only in leisure trips (30%). There is thus a high proportion of motorcyclists on the UK roads who are riding for no other reason than the fact that they enjoy the activity. These leisure riders tended to consist of long-term and returning riders owning the larger capacity motorcycles. The increased income, disposable income and employment position of these riders is likely to account for their opportunity to indulge in leisure riding. Leisure rides tended to take place on aesthetic roads with wide sweeping curvature, impressive views and little other traffic. These rides are also more likely to be undertaken at weekends and on fine, dry days.

With regard to targeting interventions, some research has suggested that fatality rates increase with engine size. A regression analysis was undertaken to identify which riders (in terms of demographics etc.) ride which type of bike (in terms of engine size). Those riders earning a higher wage and holding a senior position of employment tend to own the larger engine motorcycles. Long-term and returning riders are statistically more likely to own a larger engine machine, and previous comparisons across rider types suggests that they are more likely to be leisure only riders. In addition, an analysis of the STATS19 accident data showed that the larger the machine the further away the rider was from home when the accident occurred, indicating that leisure rides take place, perhaps, on more unfamiliar roads.

Having established the characteristics of the current UK motorcycling fleet, a second survey was carried out. The aim of this survey was to identify a set of common risky riding behaviours and to explore the demographic and personality factors influencing riders' intentions to engage in such behaviours. Of interest was to discover whether the Older Motorcyclist intended to engage in these risky riding behaviours more frequently than their younger counterparts. These behaviours, identified as predictors of accident involvement, were selected related to speeding, close following, awareness, riding whilst under the influence of alcohol and riding as part of a group. Using the *Theory of Planned Behaviour* and a number of other variables, such as demographics and measures of personality, we attempted to discover the key predictors of engaging in such risky behaviours. By discovering these key predictors, interventions can be formulated to address them.

The results of the survey indicated that past behaviour emerged as the most consistent, strong and significant predictor of intentions to engage in the various risky riding behaviours. Thus, if a rider admitted to engaging in a risky behaviour in the past, they were more likely to intend to do so in the future. Whilst this may seem a simplistic conclusion, the implication is that risk taking is a learned behaviour that needs to be addressed at the point of skill acquisition (i.e. training). This presents a problem, however, in that motorcyclists may choose to ride in order to provide opportunities for risk taking.

Attitudes and behavioural beliefs (e.g. beliefs that speeding is enjoyable and that speeding allows me to beat the traffic) also emerged as consistent predictors of intention to engage in risky riding. Interventions designed to change the overall evaluations of these risky riding behaviours may prove effective in reducing the incidence of these behaviours in riders. That is to say, individuals' beliefs about the consequences of their actions should be challenged. If we could increase the belief amongst speeders that speeding increases the risk of an accident and decrease the belief that it leads to feelings of exhilaration, then their intentions to speed and actual speeding should decrease.

It was also found that those not intending to engage in risky riding tended to perceive more pressure from referent groups (police, other road users, family and other bikers) and wanted to comply with the wishes of these groups. As a deterrent to risky riding, it could be useful to emphasise, either through publicity campaigns or training regimes, that these referent groups would disapprove of them putting themselves at risk and outline the consequences of them doing so (e.g. hospitalisation/incapacity to care for one's family etc.).

Demographic and personality characteristics, such as risk perception, were not significant predictors after taking account of the above variables. The fact that age was not a strong predictor provides more weight to our original hypothesis that this should not be the only way of characterising motorcyclists.

With regard to interventions, the following recommendations are made:

- Regression analysis of intentions to engage in risky riding behaviour suggested that **younger** riders are more to likely to intend to engage in speed-related behaviours. Campaigns specifically aiming to reduce inappropriate speed could therefore be designed with this younger age-group in mind and could be actively publicised in places and at times where this sub-group are most likely to pay attention.

- Regression analysis suggested that **leisure riders** tend to own larger capacity machines. As this rider group comprises mainly long-term or returning riders, campaigns would benefit from targeting this older generation of motorcyclist.

- **Changing behavioural beliefs** about risk taking could reduce its prevalence and appeal. This is appropriate not only for **new riders** who can be reached through the training and licensing procedures, but also for more experienced riders who have perhaps been involved in road crashes already. Most typically this would be achieved through **persuasive communications**, although more novel approaches might include **experiential or vicarious learning** where individuals gain more direct experience of the consequences of different risky riding behaviours.

- The sub-group of **returning riders** should not be ignored; whilst they may be returning to the activity as an opportunity for engaging in risky behaviour, changes in testing procedures could require them to be re-trained or assessed.

This has implications for introducing an **'expiry date'** on a motorcycle licence if motorcycle ownership ceases for a certain period of time.

- The existing training regime could also benefit from the **allusion to key referent groups**. If we could increase the belief that family or friends would disapprove of risky riding behaviours it follows that intentions and subsequent behaviour should change.

- Leisure riders reported dramatic increases in use in the **summer months**. Given the concomitant increase in accidents during the dry months, this would be an ideal time to target any campaigns to improve driver/rider knowledge or awareness, when the proportion of fair weather, returning riders is at its highest on the road. Discouraging the use of public roads as a form of entertainment should become a focus for policy makers.

- Since past behaviour was highlighted as a key predictor of intentions to engage in risky riding behaviour, **continual training** throughout a motorcyclist's riding career should be encouraged, e.g. schemes such as a free course offered at the point of sale could be beneficial. This is particularly relevant for returning riders, given the way in which they purchase relatively large machines relatively quickly when they return. The identification of these returning riders and legislative changes to ensure they undertake **compulsory refresher courses** is suggested.

- Finally, with motorcycling growing in popularity, **drivers of other vehicles** may not have the requisite skills to interact frequently with motorcyclists. The current 'Now you see him' Think campaign should be extended, with an emphasis on road-sharing and vigilance.

1 THE OLDER MOTORCYCLIST – THE NEED FOR RESEARCH

Despite the high fatality rate of motorcyclists, little is known about the current population of motorcyclists in the UK. There is a general feeling that the very nature of motorcycling is changing. Some have purported that, whilst riding a motorcycle used to be an alternative, cheap method of transport, nowadays it has become more of a leisure activity, with the large majority of new machines sold being of large capacity and sold to a more mature rider. This mature rider is the focus of this research.

There is little research that investigates specifically the role of age in motorcycling accidents; there is less still that looks at whether taking a break from motorcycling adversely affects accident liability. Previous research on motorcycle accident severity has concentrated heavily on issues relating to head injuries and fatalities, and has predominantly emanated from the USA. Until recently, little work conducted in the motorcycling safety domain has provided multivariate examination of the determinants of accident severity. This has been addressed in the UK, in part due to the formation of the DfT Motorcycle Research Taskforce, which has been able to identify and suggest topics to be included in the government research funding strategy. This section is not an exhaustive review of motorcycling research; the reader is directed to the Elliot *et al*., (2003a) scoping study and to the full review for the Older Motorcyclist project (Jamson and Chorlton, 2001).

1.1 The increase in motorcycling casualties

In recent years, the total number of road accident casualties in the UK has been steadily decreasing. In 2002, the number of car users killed or seriously injured had fallen by 19% since the 1994–98 average. Motorcycling, however, is generally recognised as a more risky activity. Before 1996, the number of killed and seriously injured motorcyclists was following the same general downward trend as car accidents. Since then, however, there has been a steady year-on-year increase in the total number of motorcycle casualties (see Figure 1).

Figure 1: Numbers of killed and seriously injured motorcyclists
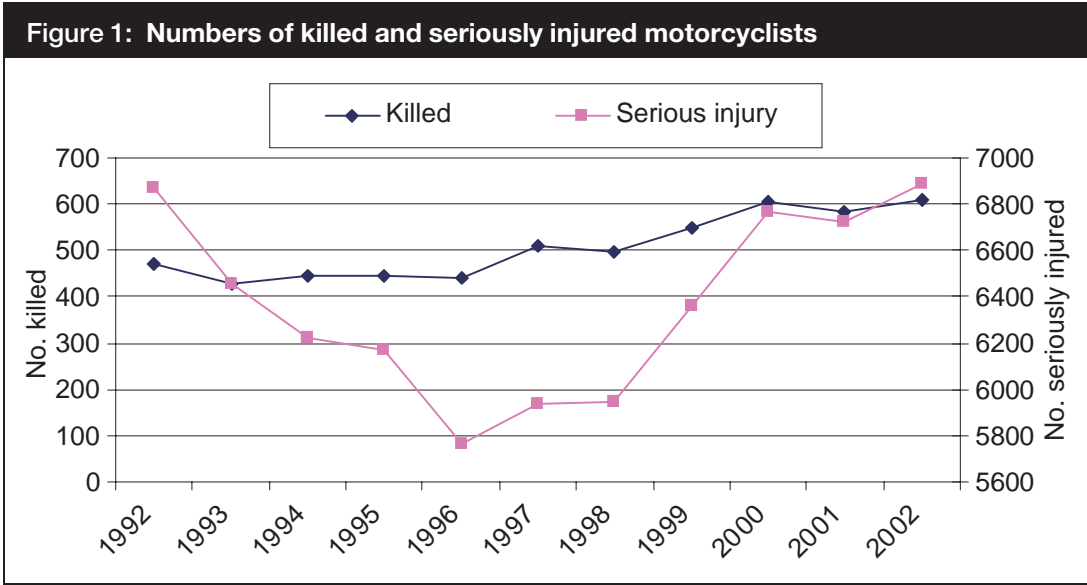
The number of killed and seriously injured motorcycle casualties in 2002 stood at 16% above the 1994–98 baseline. Taking the fatalities only, compared to the baseline, the 2002 figures stand at 30% higher. There are a number of possible reasons for the increases in motorcycling casualties and these are described in the following sections.

1.2   Changes in motorcycle ownership

If we take the accident statistics at face value, we would conclude that motorcycling has become a more risky activity over the past few years. However, there are a number of other factors that we should consider before this conclusion is made. Most importantly, these figures do not take account of exposure, i.e. the number of motorcycles on the road and the amount of mileage they do. This would provide us with a more accurate calculation of risk by giving an estimation of casualty rate. The number of licensed motorcycles can be seen in Figure 2, along with the traffic levels measured for all power two-wheelers. It can be seen that in 1996 there was a relatively sharp increase in the number of motorcycles licensed over 500cc and a concurrent rise in the number of kilometres driven.

Figure 2: Trends in motorcycle ownership and traffic
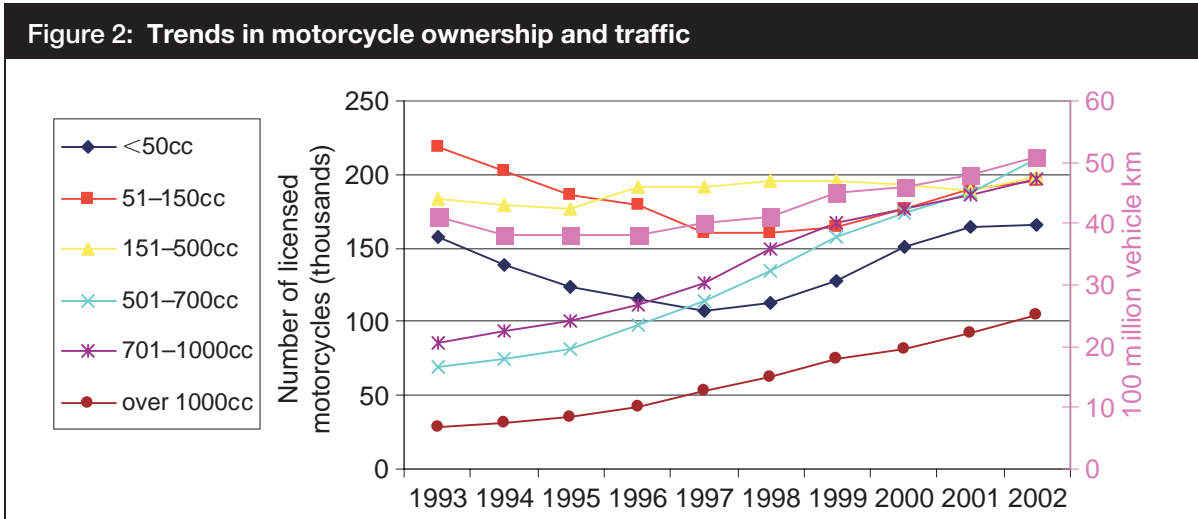
This indicates that the popularity of motorcycling increased around this time, which in turn would have an increasing effect on the number of accidents and casualties. When calculating casualty rates, this increase in vehicle mileage has effectively reduced the casualty rate even though the actual numbers of killed and seriously injured motorcyclists have risen steadily since 1996 (see Figure 3). When we compare motorcycling to car driving, the 2001 UK road accident statistics (DfT, 2002) show that the casualty rate for motorcyclists was 558 (per 100 million vehicle kilometres) as opposed to a casualty rate of 50 for car drivers. When considering fatalities, this relative risk of approximately 10 to 1 increases to 30 to 1.

Figure 3: Motorcycle casualty rates
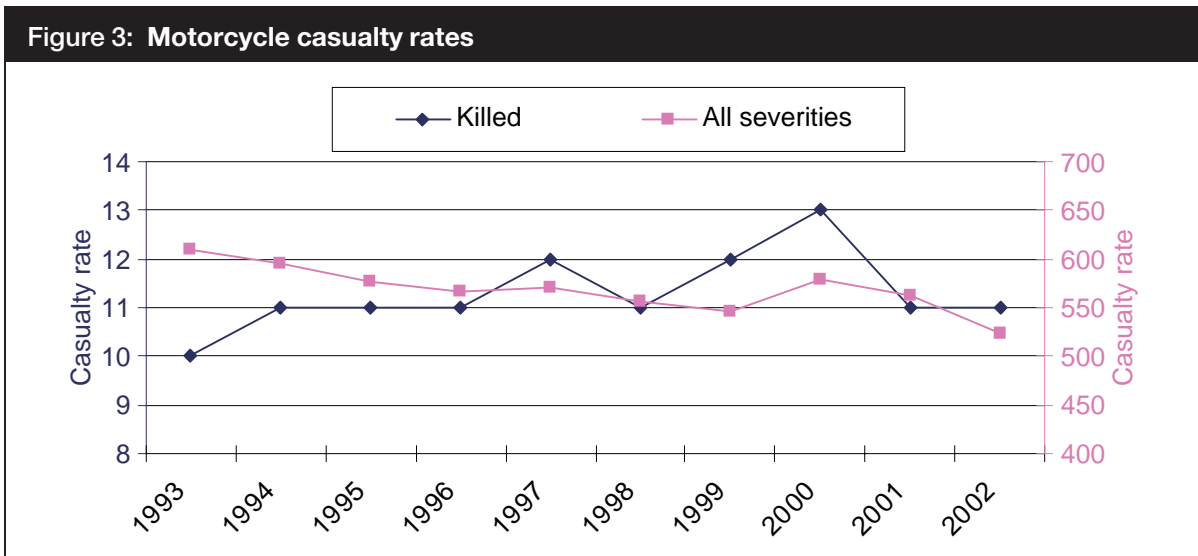
Despite the falling casualty rate, there is still a need to understand the rise in fatal and serious motorcycling casualties in order to be able to contribute to road safety policies that cater for all road users. From the figures above it appears that motorcycles over 125cc account for most of the rise in popularity, and this would correspond to the introduction of the Direct Access method of licensing and also to the increase in availability of motorcycles over 500cc.

1.3   Changes in the motorcyclist population

A number of countries, besides the UK, have recognised the changing patterns of motorcycle ownership (and hence accident statistics) in the past decade or so. An Australian study (Haworth *et al.*, 2002) noted that, whilst the number of motorcyclists aged under 30 involved in crashes almost halved from 1991 to 2000, the number of motorcyclists aged above 30 more than doubled. However, the crash involvement rate of licence holders aged above 30 is lower than that of younger licence holders and it decreases with age. The authors suggest that this decrease is in part due to exposure (they found the older the rider, the less they rode) and to increased experience. This was because the older group contained fewer learner and probationary licence holders who have a higher crash involvement rate than fully licensed riders. In terms of accident characteristics, the Australian study found that riders aged 30 and over were involved in relatively more single vehicle crashes. Whilst much of this reflected their relatively greater involvement in rural crashes, it was also true for metropolitan crashes. The finding that older riders were also over-involved in crashes in medium- and high-speed zones suggests that this pattern of crashes may indicate a pattern of open-road riding, rather than commuting.

In the USA too, the older motorcyclist has been recognised (US DOT, 2000): the average age in 1980 was 24, it is now 38. Furthermore, the mean age of motorcyclists' fatalities has also increased from 29.3 years in 1990 to 36.3 years in 2001. The analysis also indicates a corresponding rise in the average age of motorcyclists killed and the greater involvement of motorcycles with larger engines in fatal crashes.

When the accident statistics for the UK are examined by age group, it becomes clear that the rise in fatal and serious motorcycling casualties is specific to those aged between 25 and 59 (see Figure 4). Accident numbers (and fatality rates) may have risen due to increasing numbers of older riders on the road, possibly exacerbated by their use of larger machines.

Figure 4: Trend in UK motorcycle casualties by age group
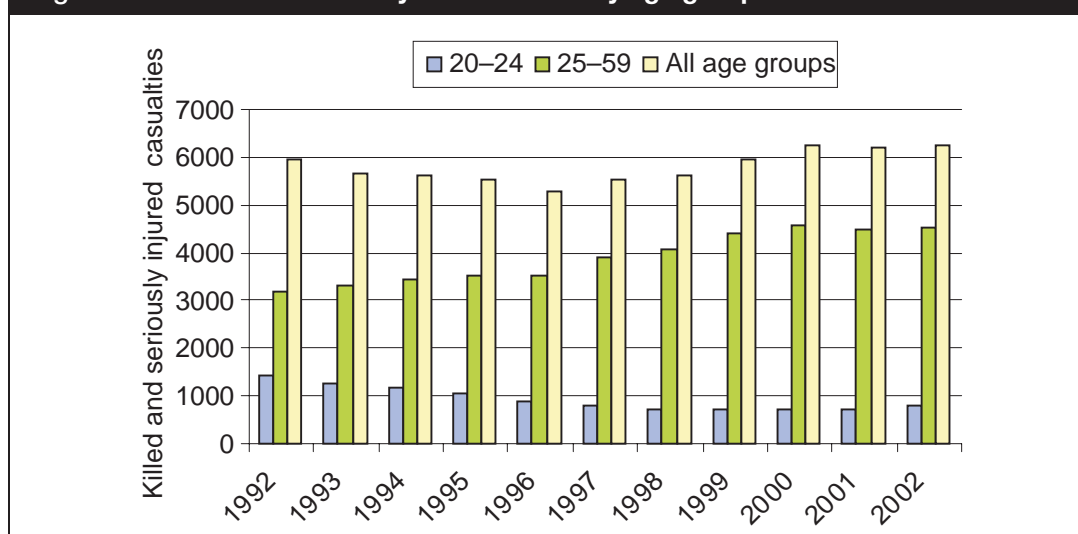
Taylor and Lockwood's (1990) report details the results of a self-report questionnaire that attempted to establish the relationship between various demographic variables and (serious) accident liability. They found that as age and experience increased, accident liability decreased. However, they also found that accident liability increased as exposure (mileage) increased. This finding is confirmed in the Transport Research Laboratory (TRL) survey of 11,360 UK motorcyclists (Sexton *et al.*, 2004). An in-depth accident study (Clarke *et al.*, 2003) found that there were two peak age-ranges for accident involvement, 16–20 years and 31–35 years.

The recent rise in the number of motorcycling casualties in the higher age bracket could be a result of low experience and/or increased exposure. This low experience could either reflect riders who have taken up motorcycling later in life, or those who have returned to it after a break. It should be noted, however, that Sexton *et al.*, (2004) found no evidence that riders returning from riding after a break demonstrated a higher accident liability.

Evidence that there is a proportion of the motorcycling population who have returned to motorcycling after a number of years away from the activity coupled with the increase in the power to weight ratios in the motorcycling fleet suggests there may be cause for concern regarding skill loss. No literature has been identified relating to the retention of driving (or riding) skills after a break from the activity. There is, however, plenty of literature that reports how perceptual and motor skills might be lost over time if there is no intervening practice period (e.g. Carron, 1971; Naylor *et al.*, 1968; Sauer *et al.*, 2000).

A lack of experience is also a cause for concern for those riders who are new to the activity. Research in the novice driving field indicates that the first year of driving history is the most dangerous in terms of accident risk. An older individual engaging

in motorcycling for the first time is also limited in experience and may well exhibit characteristics similar to novice drivers. Indeed, riding experience has been cited as one of the major contributory factors (Mortimer, 1984), and has led to the conclusion that a significant number of motorcycling accidents occurred within the first six months of motorcycle riding. Haworth and Smith (1998) attempted to identify risk factors for accident and non-accident involved motorcyclists. They found that riders aged under 25 and riders who rode less than three days a week were at greater risk of crashing. Recreational riding was associated with higher crash risk than work-related riding. Unlicensed riders, unregistered motorcycles and borrowed motorcycles were also associated with increased risk.

So why has there been an increase in mature riders on the road? Certainly there is evidence from the Family Expenditure Survey (FES) that disposable income has increased steadily over the last 30 years. This rise in disposable income seems to be disproportionately spent; i.e. expenditure is not even across commodities. Whilst expenditure appears to be constant for items such as food, fuel and household goods, expenditure has gradually increased in the 1990s for items of leisure and motoring (see Figure 5).

Figure 5: **Expenditure over the last 30 years**
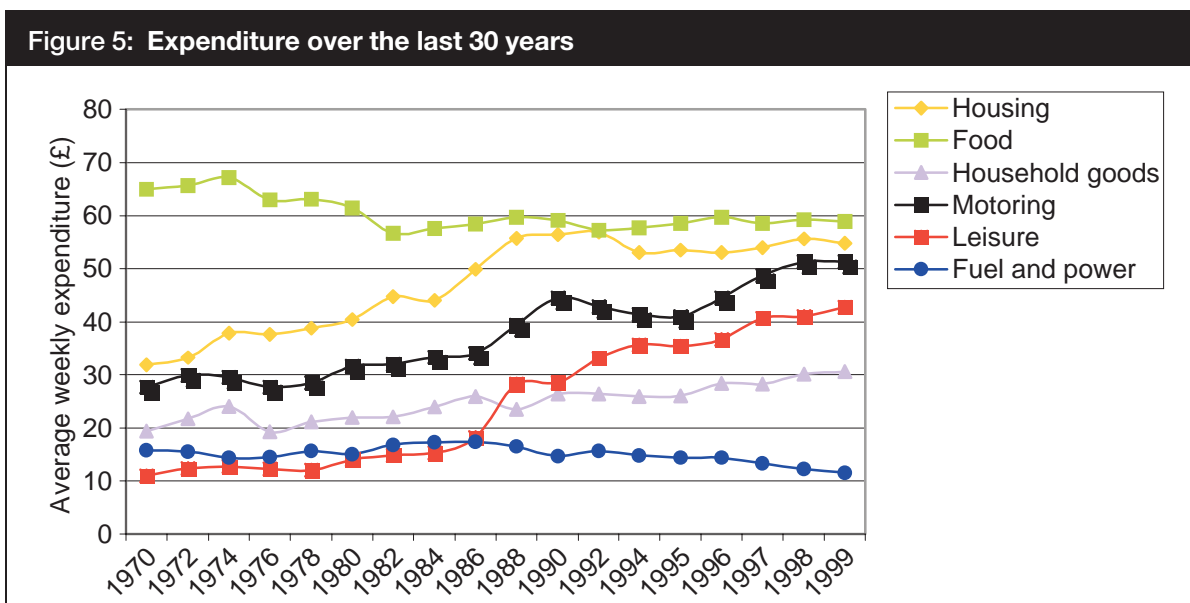
These increases in expenditure also vary depending on the age groups. As one might imagine, those in the age bracket 30–65 have a much higher expenditure and associated disposable income (see Figure 6).

Figure 6: Expenditure and associated disposable income
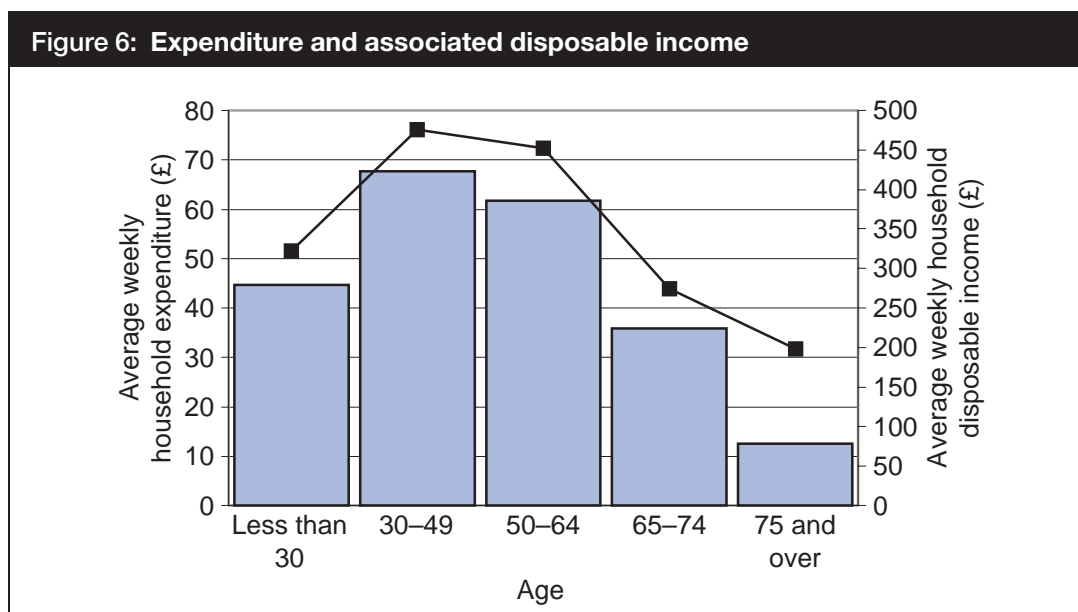
Therefore there appears to be a cohort of riders, probably riding the powerful machines, in an older age bracket who may be contributing to the rise in accident numbers. If this is true, it would be useful to establish the types of vehicles they ride and where they ride them.

1.4   Summary

The 'Older Motorcyclist' was a DfT funded project set up with the intention of establishing the characteristics of a sample of the UK motorcycling population and to discover whether there was a readily identifiable group of riders that might fit the stereotype of the 'Older Motorcyclist'. The underlying impetus for the research was the identification of possible interventions that might improve the conditions and resulting road safety for the motorcycling population.

This review provides suggestions for the possible explanation of the rise in accidents over recent years, examining increases in exposure, increases in income and expenditure, changes in exposure and changes in ownership characteristics. Hobbs *et al*.'s, (1986) examination of rider characteristics suggested that there was a trend for male riders up to the age of 25 years to favour the larger machines. Amongst the older rider, the smaller machines were more usual, especially in the 40 years and over age-group, where 67% of male riders rode motorcycles of 150cc or less. Our own survey work, however, suggests that this pattern has changed dramatically in the light of today's climate of high insurance premiums for larger bikes, particularly for younger riders.

The key questions are:

1. Have the number of motorcyclists in the age range 30+ increased in recent years, and if so why?

2. Who are these older motorcyclists, what and where do they ride, and what is their history of bike use?

3. What types of accidents are the older motorcyclists involved in and do their accidents display particular characteristics that differentiate them from those of other age groups?

4. Can the older motorcyclist be characterised differently in terms of psychological determinants? Do they exhibit different risk awareness skills and attitudes to safety?

5. How are enforcement, engineering and training solutions best addressed for this population of riders, taking into account the types of accident they have and on which roads?

These questions were answered by way of two large surveys; the first was mailed out to 5000 UK motorcyclists, the second to over 30,000.

2 SURVEY ONE: MOTORCYCLE OWNERSHIP AND PATTERNS OF USE

2.1 Aim of the survey

The main aim of the survey was to establish the characteristics of the current motorcycling population, paying particular attention to the 'Older Motorcyclist'. A survey was distributed to a sample of the UK motorcyclists in order to discover the types of bike that they ride, where they choose to ride them, past experience, training undertaken and accident history. A copy of the survey can be found in Appendix 1.

2.2 Administration

The survey originally intended to compare motorcyclists under and over 30 years of age. However, due to the lack of synergy between the Driver and Vehicle databases that the Driver and Vehicle Licensing Authority (DVLA) hold, this was impossible. Instead, the sample was stratified using engine size. Using the total number of licensed motorcycles in the year 2000, divided into taxation classes, a stratified sample was requested from the DVLA. The survey was professionally printed into an A5 booklet. A cover letter was included which explained the nature of the research and asked respondents to return the survey by a specified date in the freepost envelope provided.

2.3 Results

This section first provides an analysis of owner characteristics using variables such as demographics and patterns of usage. Then a regression analysis investigates which riders choose what type of machines (in terms of engine size). Finally, patterns of ownership are examined, taking a retrospective look at riders' motorcycle history in terms of what they have ridden, but more importantly how their pattern of ownership has evolved over the years.

2.3.1 Response rate

The survey was distributed to 5300 registered keepers of motorcycles. 1009 riders responded to the survey (20% response rate). Of the 1009 riders who responded, 995 riders (99%) currently owned a motorcycle. In addition, of the 995 riders, six riders did not provide gender details, so the analyses focused on 897 males (age range 17–85 years, Mean (M) = 44.3, Standard deviation (SD) = 12.2) and 92 females (age range 17–74 years, M = 37.9, SD = 12.3). Throughout the analyses, the number of riders varies slightly due to some respondents missing out certain items. The requested and achieved samples are shown in Table 1.

Table 1: Requested and achieved samples					
Engine size	**UK fleet (%)**	**Number requested (%)**	**% of sample**	**Number achieved**	**% of sample**
< 50cc	17.05%	900%	16.98%	87	8.8%
51cc–150cc	19.47%	1000%	18.87%	87	8.6%
151cc–200cc	1.57%	100%	1.89%	10	1.0%
201cc–250cc	4.59%	300%	5.66%	44	4.4%
251cc–350cc	1.09%	100%	1.89%	9	0.9%
351cc–500cc	7.50%	400%	7.55%	79	8.0%
501cc +	48.73%	2500%	47.17%	675	68.1%
Total	*100.00%*	*5300%*	*100.00%*	*991*	*100.0%*

2.3.2 Classification of the motorcyclists

Cluster analysis was performed in order to establish if there were any clear and useful groupings of motorcyclists. The cluster variates consisted of the following three variables: (a) age (years); (b) engine size (cc); and (c) motorcycling experience (years). Three initial clusters emerged, i.e. groups of motorcyclists with high, intermediate or low z-scores on the three variables assessed (Figure 7).

Figure 7: Profiles of the three clusters of motorcyclists
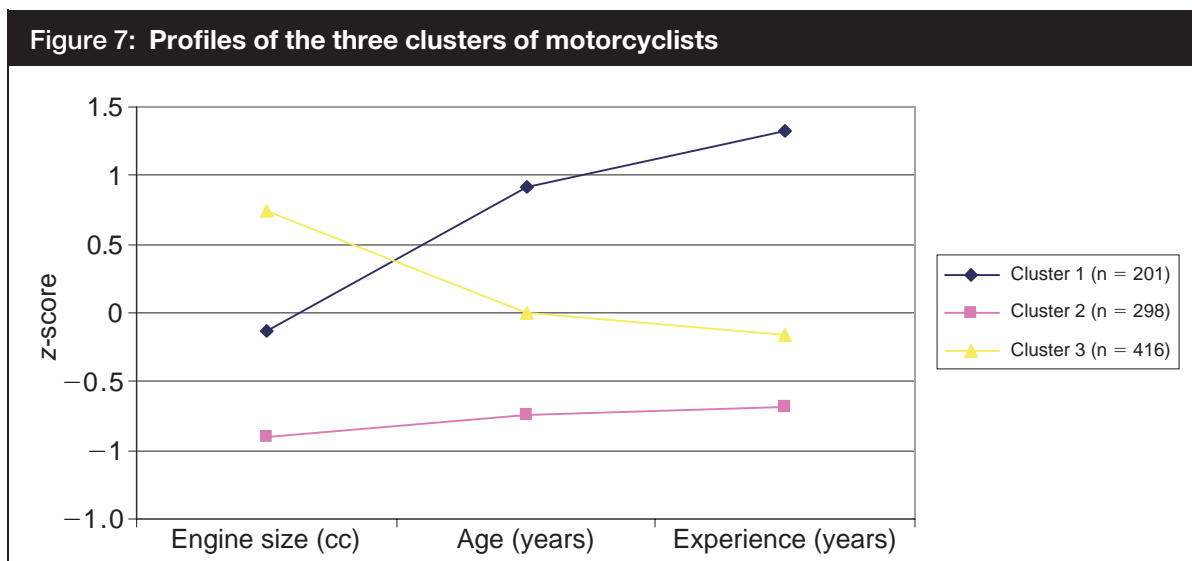
Cluster 1 is the oldest group, with intermediate size bikes and the highest level of experience.

Cluster 2 is the youngest group, thus they have the least amount of experience and ride machines with smaller engines.

Cluster 3 is younger than Cluster 1, they have less experience than Cluster 1, but have much larger machines than them.

The mean values for the three cluster variables are shown in Table 2.

Table 2: Mean values for the cluster variates			
	Engine size (cc)	Age (years)	Experience (years)
Cluster 1 (n = 201)	662	52	22
Cluster 2 (n = 298)	374	35	7
Cluster 3 (n = 416)	1047	42	11

Clusters 1 and 2 would seem to map onto our groupings of long-term and new riders, but none of the clusters identify young (i.e. under 30) motorcyclists who ride low-powered scooters or mopeds. The cluster analysis has effectively grouped these riders with those who ride more powerful machines. In addition, the cluster analysis does not help to identify riders who have started or returned to motorcycling late in life. Whilst the title of the project refers to the Older Motorcyclist, it is perhaps not the most useful of terms for identifying the changing nature of the motorcycling population. There are bound to be other factors that contribute both to a rider's desire to ride and to the type of machine that a rider chooses to ride. Age could be less important than, for example, lifestyle or disposable income, although of course there will be a relationship between age and these types of variables.

The age distribution of the sample obtained is shown in Figure 8. The mean age of the respondents was 43 years old, with 46% being between the ages of 35 and 50. Originally, the DfT tender documents refer to the Older Motorcyclists as being over 30 years of age. Only 12% of our sample was aged below 30, which does not allow for a statistically robust comparison of the under and over 30s. In effect, the vast majority of our sample were Older Motorcyclists.

Figure 8: Age distribution of the sample
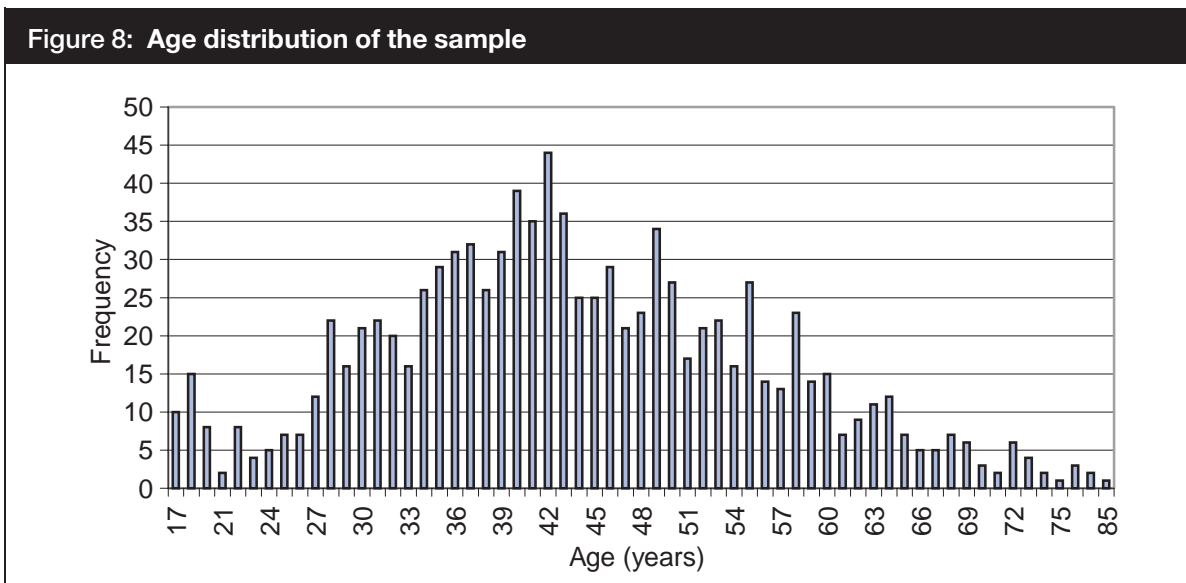
Therefore, rather than classifying riders solely by age, it was also thought useful, for the purposes of targeting intervention and prevention measures, to additionally classify riders by their riding habits. Considering that riders who have returned to motorcycling after a number of years away from riding are of particular concern to a number of parties (including the DfT and enforcement agencies), it was felt that this group of riders should form their own category. These riders will be referred to as returning riders. Further conversations with both motorcyclists themselves (in the piloting stage of the project) and a number of police authorities established the existence of a further group of riders – those who have built up a wealth of experience over a considerable length of time. These riders have generally not taken a substantial break from the activity and will hence be referred to as long-term riders. A final group logically emerges, defined as those who have recently taken up motorcycling and are termed the new rider group. This group accounts both for those who gain their licence at a young age and those who take up motorcycling later in life. The groups were defined as:

New rider: A motorcyclist who had taken up riding after 1996. The year 1996 was chosen as a cut-off point since it is this year and onwards that shows a steady rise in the number of motorcycle casualties (approximately 10%). Of course, it is not clear whether this increase was due to an increase in the number of riders or to other factors.

Long-term rider: A motorcyclist who began riding before 1996 and who had ridden continuously without having taken a break of ten years or more.

Returning rider: A motorcyclist who returned to riding from 1990 onwards having taken a break of ten years or more. 1990 was chosen as a cut off point to provide a sufficiently large sample for statistical testing.

We thus established the existence of three groups of riders, based on both experience and age. The research team felt that in the light of previous perceptual and motor skill research that purports that skill may be lost over time if there is no practice of that skill, this categorisation was more ecologically valid. In addition, research evidence from the driving field shows that both experience and age are important determinants of accident liability (Maycock *et al.*, 1991; Forsythe *et al.*, 1995). If novice riders do indeed show similar attributes to novice drivers, then there is every reason to be cautious in using age as the single defining factor. This is particularly relevant to the targeting of resources for safety interventions.

The proportion of each of these riders in our sample is shown in Table 3.

Table 3: Categorisation of riders by experience		
	n	**% of sample**
New rider	217	22%
Long-term rider	539	56%
Returning rider	212	22%

2.3.3 Demographics

The mean age of all respondents was 41 years (males 43 years, females 40 years). Over 90% of our sample was male, of which 10% were under 30 years of age (Table 4). Females were twice as likely to be under 30, compared to males.

Table 4: Distribution of gender by age category						
	Male			**Female**		
	n	**%**	**% of total sample**	**n**	**%**	**% of total sample**
Under 30	93	10%	10%	23	25%	2%
30 and over	798	90%	81%	69	75%	7%
Total	**891**	**100%**	**91%**	**92**	**100%**	**9%**
Total				**983**		

Using the alternative classifications, it was found that over half of the male sample were long-term riders, with the remainder split fairly evenly between the remaining categories (Table 5). For females, however, the majority (65%) were new riders. Females were half as likely as males to be returning riders.

Table 5: Distribution of gender by rider type						
	Male			**Female**		
	n	**%**	**% of total sample**	**n**	**%**	**% of total sample**
New rider	159	18%	16%	58	65%	6%
Long-term rider	519	59%	54%	20	23%	2%
Returning rider	201	23%	21%	11	12%	1%
Total	**879**	**100%**	**91%**	**89**	**100%**	**9%**
Total				**968**		

The vast majority of new riders were under 30 (Table 6). Long-term riders were twice as likely to be over 30 than under. Returning riders, by definition, were all over 30 (except one).

Table 6: Distribution of rider type by age category						
	Under 30			**30 and over**		
	n	%	% of total sample	n	%	% of total sample
New rider	76	68%	8%	141	17%	15%
Long-term rider	35	31%	4%	503	59%	52%
Returning rider	1	1%	0%	207	24%	21%
Total	**112**	**100%**	**12%**	**851**	**100%**	**88%**
Total			*968*			

Age statistics for each of the rider types are provided in Table 7. Males have a wider age-range than females, and those females who have returned to riding are generally younger than their male counterparts.

Table 7: Riders' age by rider type and gender								
	Male				**Female**			
	Mean	SD	Min	Max	Mean	SD	Min	Max
New rider	33.75	10.46	17	64	33.86	11.70	17	59
Long-term rider	45.62	11.36	22	77	44.30	9.23	27	59
Returning rider	48.95	9.62	26	74	42.45	7.67	33	60

As might be expected, the age distribution of new riders was positively skewed towards the younger age-range, with a peak in the 17–20 age-range and mean age of 34 years (Figure 9). The range of the distribution showed there to be a significant proportion of the sample that started riding in their 30s (40%). Furthermore, a significant proportion of the sample took up motorcycling for the first time in their 40s (16%) and 50s (9%).

Figure 9: Age distribution of new riders
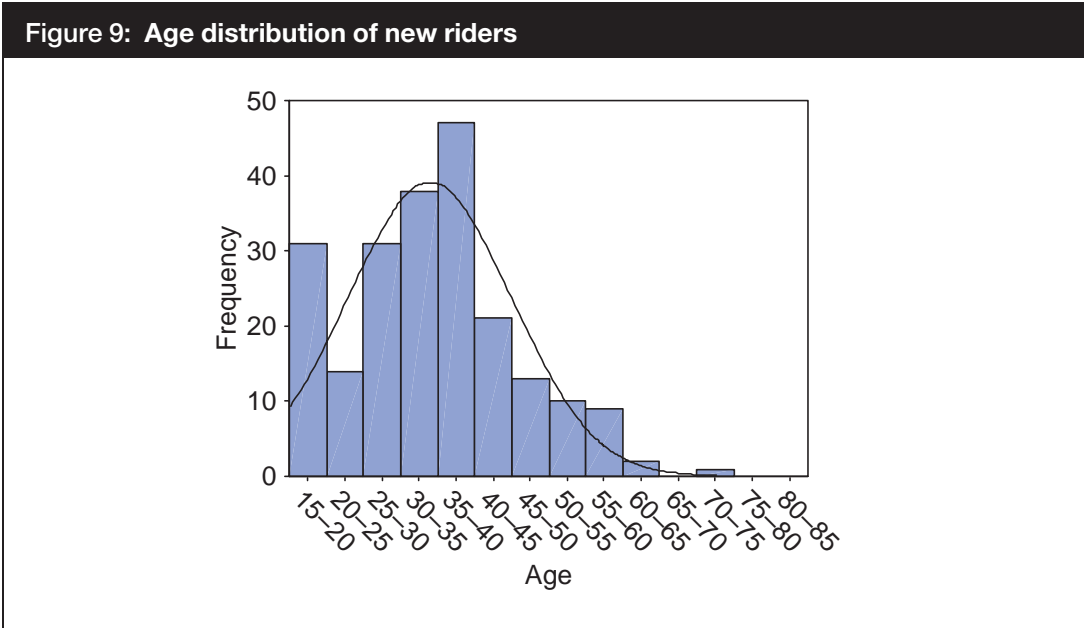
The distribution for both the long-term and returning riders (Figures 10 and 11), on the other hand, showed more normality and had similar means (45 years). However, the distribution of the returning riders demonstrated a slightly higher value of kurtosis (-0.395) than the long-term riders (-0.307), indicating a more 'peaky' distribution. In effect, those riders who have taken a break were more likely to be in their 40s (40%) and 50s (26%). In addition, 16% of the returning riders were over 60 years of age.

Figure 10: Age distribution of long-term riders
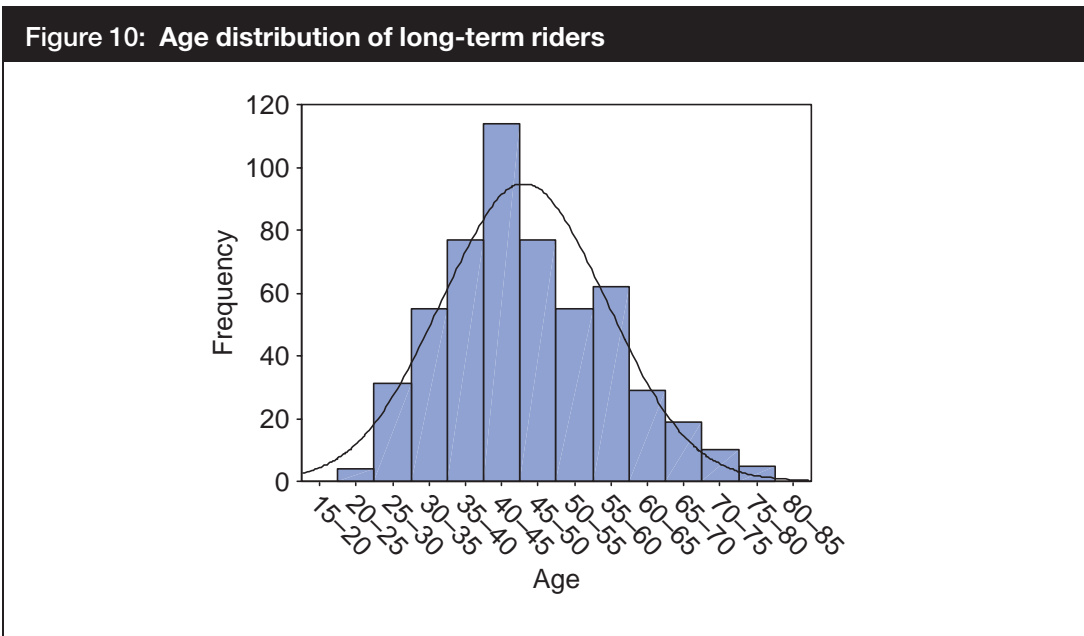
Figure 11: Age distribution of returning riders
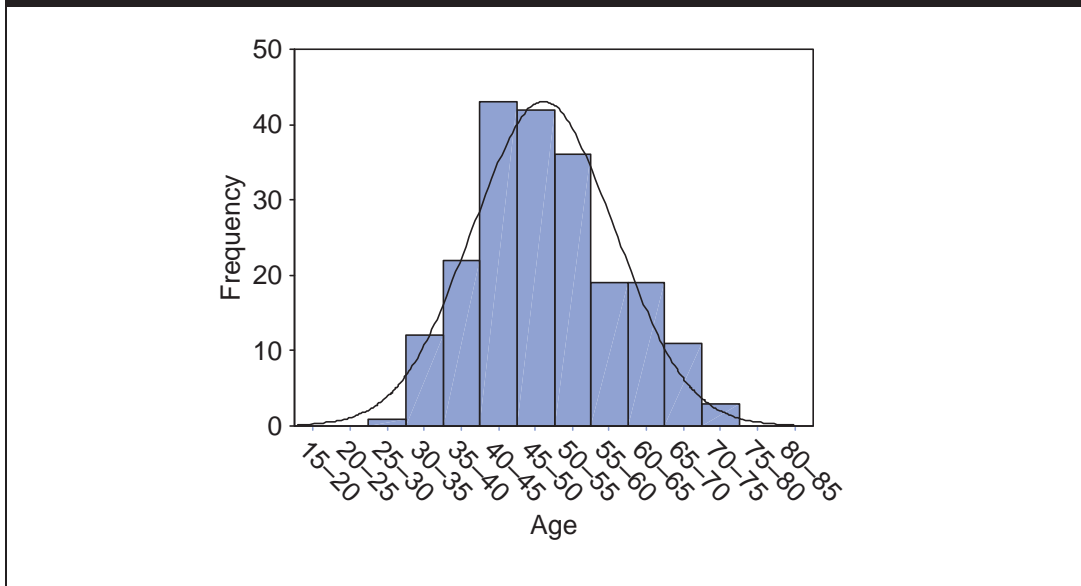
Using information gleaned about new riders' first bikes and their year of licensing, a calculation of the frequency of new riders joining the motorcycling population was made (Figure 12). It can be seen that, apart from a dip in 1998, there has been a steady year-on-year increase in the number of new riders joining the activity. Figure 12 also shows the year in which returning riders rejoined the activity. It can be seen that, based on our sample, there was a definite upturn in numbers from about 1996–97 onwards. The age distribution at which the riders returned to motorcycling is shown in Figure 13.

Figure 12: Profile of new and returning riders
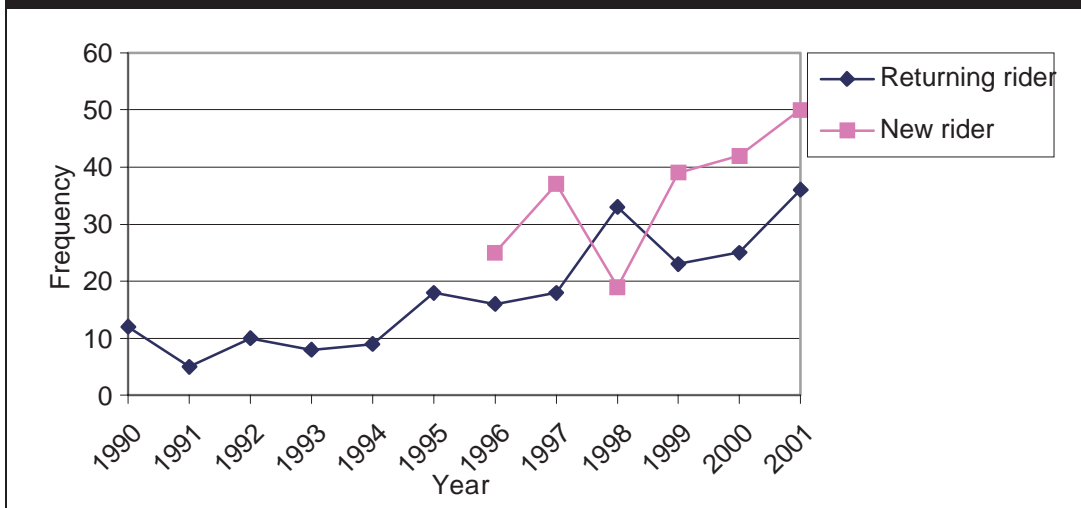
Figure 13: Age of returning riders (when they returned)
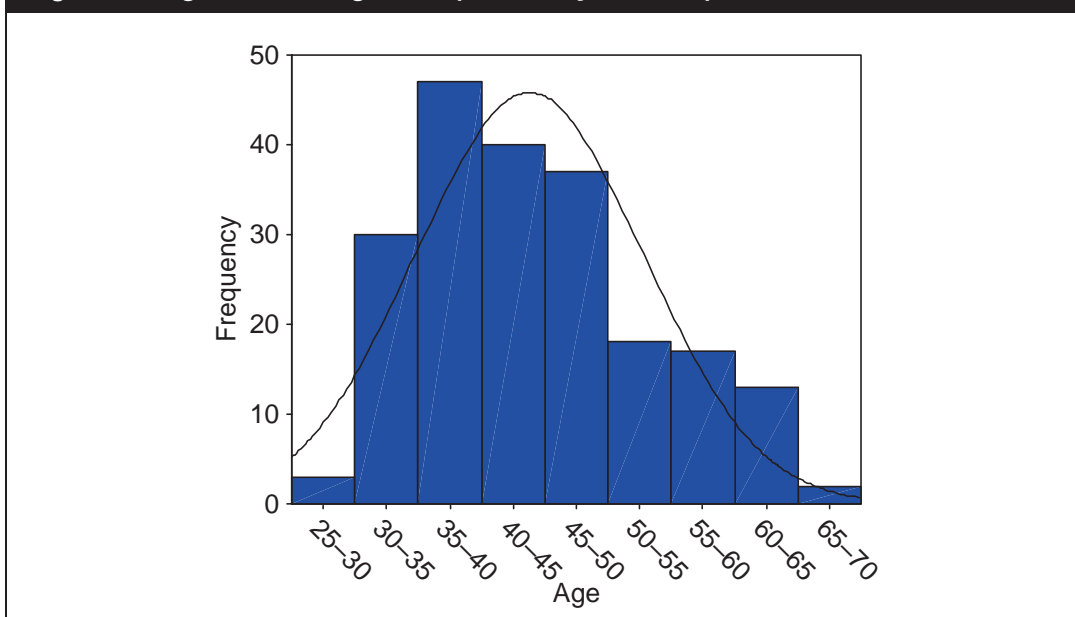
With regard to other demographic variables, this sample of long-term and returning riders demonstrates a fair amount of similarity. Domestically, both groups are much more likely to be married with fewer dependent children – probably a direct effect of the higher ages in these groups.

2.3.4 Motorcycle ownership

With regard to ownership, the survey data suggest that it is the long-term and returning riders that currently own motorcycles with engines exceeding 500cc (Figure 14).

Figure 14: Rider type by engine capacity
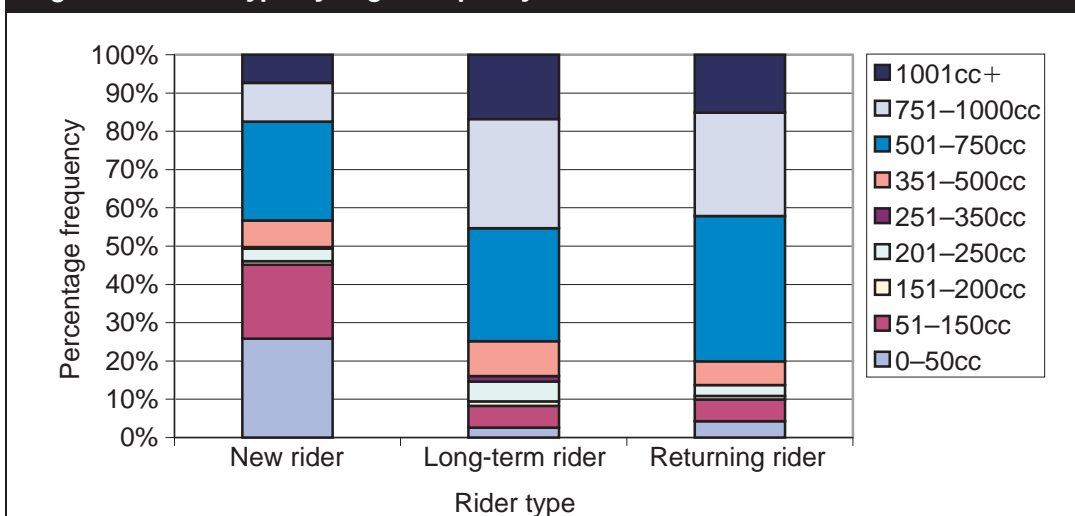
There were few differences between these two groups with respect to engine size, suggesting that even those riders who have been away from the activity for a number of years currently ride machines that are comparable to those being ridden by the long-term riders with regard to both engine capacity and motorcycle type (e.g. sports/touring etc.). On its own, the data are not particularly enlightening, as a motorcyclist's experience comprises not only of their current bike but also the bikes they have ridden in the past. These data are presented in the section entitled 'Patterns of ownership' (Section 2.3.9).

2.3.5 Motorcycling activity

Another aim of the survey was to discover for what purpose riders used their bikes, as it has been suggested that there is an increasing number of riders who use their machines for leisure purposes only. Therefore, an additional classification was used based on the type of motorcycling activities the sample engaged in. Riders were asked to report the number of commuting, leisure and other trips they made per month. Riders were categorised as being commuters, leisure riders or a combination of both (Table 8). Whilst most riders claimed to make both leisure (no purpose) and commuting trips – 56% of the sample – there was a high number of motorcyclists who claimed to engage only in leisure trips (30%).

Table 8: Categorisation of riders by motorcycling activity		
	n	**% of sample**
Commuter only rider	121	13%
Leisure only rider	288	30%
Multi-use rider	543	56%
Miscellaneous rider[1]	9	1%

If our sample is representative of the UK motorcycling population, there is a high proportion of motorcyclists on the UK roads who are riding for no other reason than the fact that they enjoy the activity.

There are a number of characteristics of these leisure riders that set them apart from the rest of the motorcycling population. To begin with, leisure riders are mostly either long-term riders or returning riders; returning riders were more likely to be leisure riders than any other type of rider (Figure 15).

---

1   Motorcyclists who did not report commuter or leisure trips but did make other trips (e.g. shopping).

Figure 15: **How different types of riders use their machines**
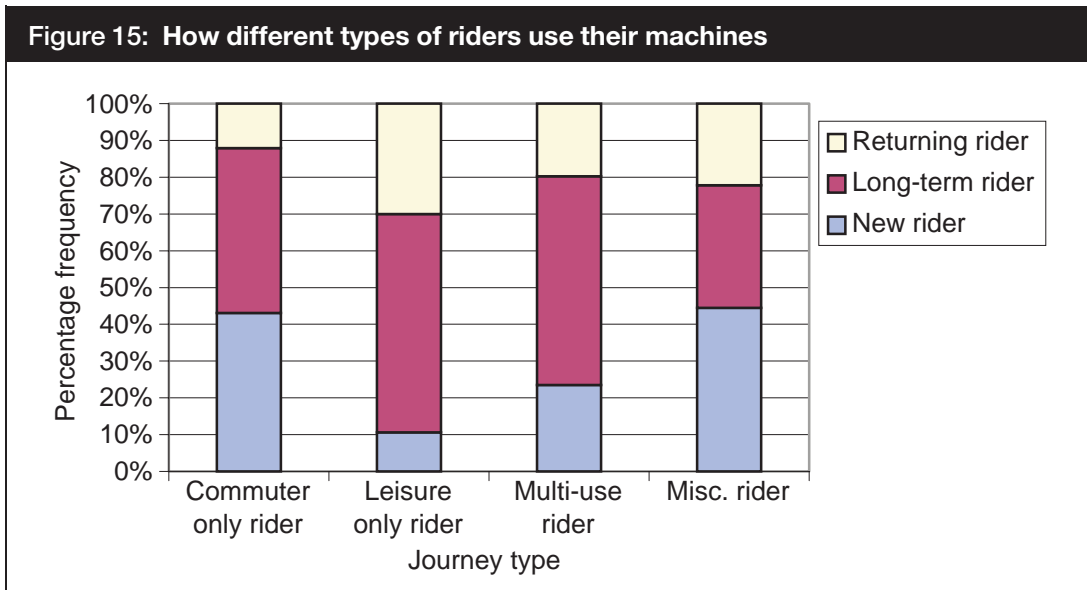
Secondly, they tend to own larger machines than commuter riders and these are mostly supersports bikes. Nearly 80% of leisure riders own and ride machines over 500cc, compared to only 30% of commuting riders (see Figure 16).

Figure 16: **Distribution of engine capacity across rider types**
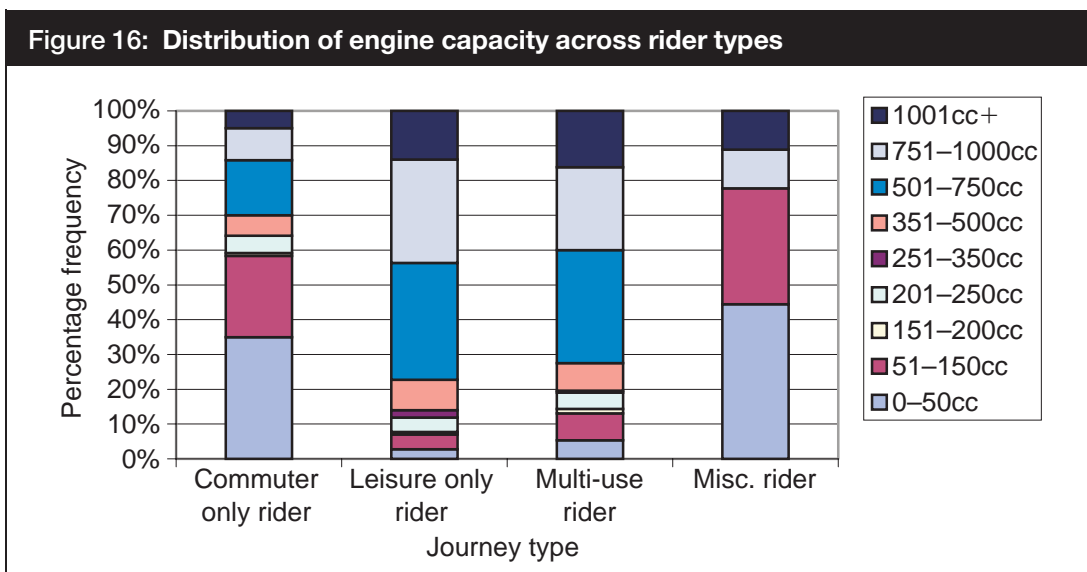
2.3.5.1 Seasonal and weather variations

Concern over the fair-weather riders' tendency to own large engine machines despite their 'interrupted' experience and a number of studies citing a lack of experience as a major contributory factor to accident involvement (Hurt *et al.*, 1981; Mortimer, 1984) prompted the exploration of motorcycle usage. Since the data have suggested that motorcyclists base their purchasing decisions on utility purpose, it becomes important to understand the effect of such on exposure. Trip purpose, trip frequency and seasonal variation data allow for the investigation of the pattern of travel by rider type and journey type. Ninety per cent of the sample reported that they taxed

their vehicle all year round. Using the same data categorised by journey type, it was possible to look at the nature of trips by rider type in more detail. Figure 17 suggests that new riders made about twice as many commuter trips per month as long-term and returning riders.

Figure 17: Mean number of commuter trips by month
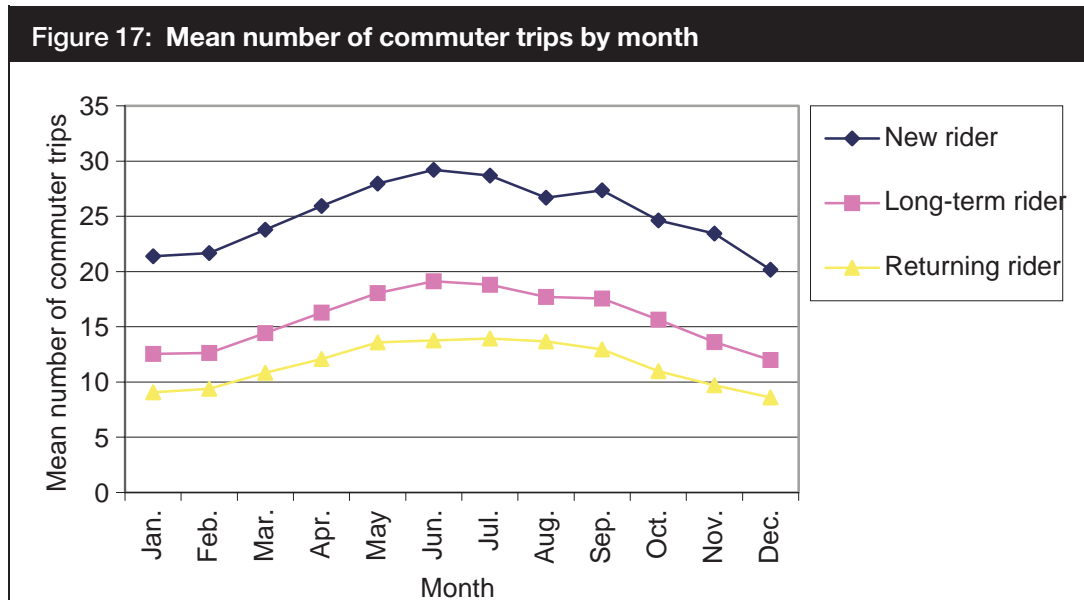
As might be expected, the number of leisure trips per month (Figure 18) was much less than the number of commuter trips. Across all rider groups there was a definite seasonal influence, with the mean number of leisure trips peaking in the summer months. Returning riders, in particular, increase their presence on the roads between June and August.

Figure 18: Mean number of leisure trips by month
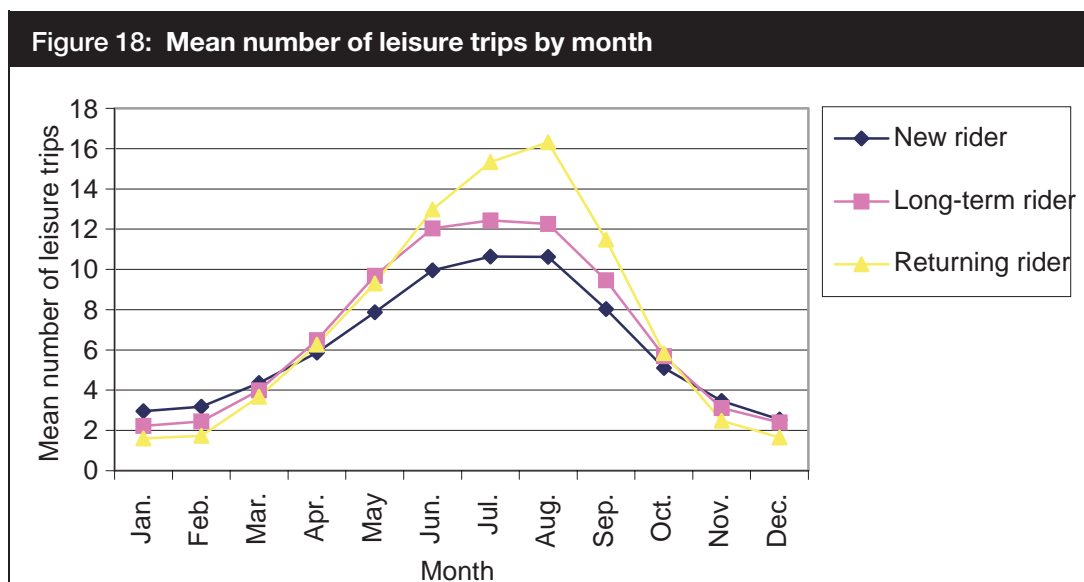
These seasonal variations were also supported by a subjective measure of usage which asked riders to rate their monthly usage relative to the month in which they made most use of their machine (Figure 19).

Figure 19: Usage by month and journey type
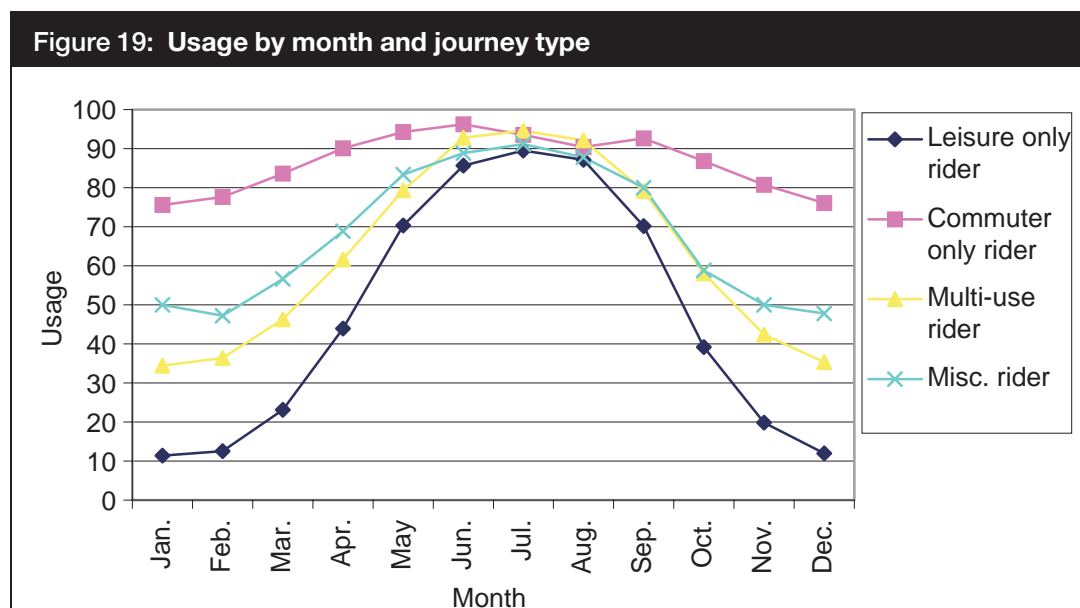
The winter months did not appear to deter commuters from making use of their motorcycles. This seems reasonable since working hours are not subject to seasonal variations. Again it was the leisure riders whose presence on the road was determined largely by the time of year.

2.3.5.2 Leisure riding

In response to the anecdotal evidence noting a concomitant increase in the number of motorcycling accidents, sales of large engine motorcycles and the migration of motorcycling to a leisure activity, a section of the survey was devoted entirely to finding out exactly where, when and why an overwhelming majority of riders take to their motorcycles in the pursuit of fun. Indeed, the data have already suggested that the leisure-only riders tend to own the larger engine capacity motorcycles and increase their presence on the roads at a time when the number of accidents is also seen to peak. Since 85% of the riders engaged in leisure rides, making trips that were for no other purpose than pleasure, the focus on these riders has proved to be imperative.

The most important characteristics of a good motorcycling route were reported as being wide sweeping roads with impressive views and little traffic, on a fine and dry day. Long straights, tight bends and fast downhill roads were preferable to a lesser extent. The possibility of 'knee down' bends did not feature as particularly important for any type of rider. Rider types did not differ in their appreciation of a

'good motorcycling' route nor in the ways in which they derived enjoyment from such rides.

The exhilaration and independence experienced by all rider types were identified as the most salient sources of enjoyment when leisure riding. However, although all the factors were described by the riders as an important source of enjoyment, 'reaching high speeds' was the least important.

The importance of speed in these data, however, does not match that of independence. The lower importance placed on reaching high speeds does, however, fit the data regarding the most common motorcycle types owned, since about half of the leisure riders owned potentially modest powered traditional and sports/touring machines. The attraction of leisure rides is perhaps not the opportunity to speed but more the opportunity to 'cruise'.

There appeared to be very little difference across the rider types in terms of where they ride and the distances they ride. The large majority of riders preferred to leisure ride on rural roads, which is not surprising since it is the quieter rural roads that afford the opportunity for uninterrupted leisure riding. Indeed, the rural road embodies many of those ideal road conditions identified earlier. Traffic on rural roads is considerably lighter and their geometry is often that of 'long straights' and 'wide sweeping' roads with 'impressive views'. Riders (28%) typically leisure ride within 26 and 50 miles of their home, and approximately 20% of riders engaged in leisure rides outside their county. Local anecdotal evidence suggests that some of the riders killed in accidents in North Yorkshire, Cheshire and Derbyshire have travelled from cities in neighbouring counties on 'ride outs'.

2.3.5.3 Group riding

There has been some media attention regarding groups of riders who 'take over the countryside' by collecting in large gatherings and riding dangerously on inappropriate roads. With just under half (49%) of surveyed riders engaging in group leisure rides (18% new riders, 60% long-term riders, 22% returning riders), it is essential to know where, when and why these group riders congregate. Riders were asked to rank the purposes of the group rides in which they participate. Table 9 suggests that the most likely reason for group rides was simply to engage in no purpose, pleasurable rides.

Table 9: Most common purposes of group rides	
Most common	**Group ride purpose**
1st reason	No purpose, purely for pleasure
2nd reason	Organised visits to motorcycling events
3rd reason	Organised visits to non-motorcycling events
4th reason	Charity rides
5th reason	Campaign rides

Our data suggest that the majority of rider groups were composed of friends, although motorcycle clubs and motorcyclists riding a similar make or model of machine also seemed a relatively frequent basis for a group. On average, the long-term rider seemed to belong to larger groups (15 other riders). The returning rider tended to ride in groups with 11 other motorcyclists, whereas the new rider rode in much smaller groups of six. The new rider may choose to ride in a smaller group where he or she can adopt their own speed and style of riding. When asked about how often they take the lead in their group rides, no pattern of differences emerged, suggesting this could be a shared role.

Typically, all rider types participated in group rides which take them over 100 miles away from their home. Although group rides were likely to be less frequent than solo trips, they were likely to be of a longer duration. Only one-quarter of group rides took place during the week. It is hardly surprising that the majority of group rides take place during the weekend since they require a number of individuals to have the spare time available. As with leisure rides, the majority of group rides take place over the course of a day. However, a slightly higher percentage of group rides continue over a weekend, particularly those involving the long-term enthusiast rider. This again seems to establish the importance of a group ride as much more of a social event and as a source of social interaction than the riders' solo leisure rides.

2.3.6 Purchasing decisions

In order to effectively target interventions, it is also necessary to know where and why motorcyclists purchase their machines. The data allowed the research team to examine which factors provide the basis of riders' purchasing decisions and how these relate to the size and type of machine currently owned. The majority (64%) of motorcycles owned at the time of the survey were second-hand at the time of purchase. Although there was little difference across the rider groups, new riders were more likely to own a new motorcycle than long-term riders or returning riders. Buying from a dealership (63% of purchases) and privately (32% of purchases) were the most popular methods of purchasing motorcycles, and there was little difference across the rider groups

Table 10 compares riders' reasons for buying their first motorcycle with their reasons for buying their current motorcycle. Although the two most common reasons remained unchanged over time, the data suggested that additional purchasing decisions for their current motorcycle were based on factors related to usage rather than the economic reasons that seemed to determine the decision to buy their first motorcycle. The reasons for buying their current machine seemed to attribute more importance to the motorcycle as a leisure activity and the image associated with such.

Table 10: **Most common reasons for buying first and current motorcycle**		
Most common	**First motorcycle**	**Current motorcycle**
1st reason for buying	Love of motorcycles	Love of motorcycles
2nd reason for buying	Independence/freedom	Independence/freedom
3rd reason for buying	Cheaper to run	To engage in leisure activity
4th reason for buying	Cheaper to insure	To avoid congestion
5th reason for buying	To engage in leisure activity	Image associated

When the reasons for buying their current motorcycles were examined by rider type, differences were clearly apparent (Table 11).

Table 11: **Most common reasons for buying current motorcycle**			
Most common	**New rider**	**Long-term rider**	**Returning rider**
1st reason for buying	Love of motorcycles	Love of motorcycles	Love of motorcycles
2nd reason for buying	Independence and freedom	Independence and freedom	To engage in leisure activity
3rd reason for buying	To avoid congestion	To engage in leisure activity	Independence and freedom
4th reason for buying	Cheaper to run	To avoid congestion	To avoid congestion
5th reason for buying	Insufficient car parking	Motorcycle maintenance	Image associated

As noted earlier, the new rider was more likely to be a commuter rider than any other group and this is strongly reflected in their purchasing decisions. The new rider values the economic and convenience benefits of the motorcycle, whereas the long-term rider and the returning rider seem to base their decisions upon the leisure and status symbol of the motorcycle. Subtle differences between the long-term rider and returning rider depict the returning rider as being an individual who not only uses the motorcycle as a form of leisure, but someone who very much identifies themselves with the current images surrounding their machine and motorcycling. The motorcycle is reportedly an 'image associated' commodity that could reflect a certain 'way of life'. The long-term rider still bases purchasing decisions upon a motorcycle's appropriateness for 'engaging in a leisure activity' but does not rank the importance of image highly. Motorcycle maintenance is instead ranked highly.

2.3.7 Training

With regard to existing training, nearly one-fifth of our sample had attended one or more voluntary training courses. However, most of these were the long-term riders, and there would thus appear to be scope in encouraging returning riders to increase their attendance at such sessions.

Table 12: Riders' post-qualification training				
	n	Number who received post-qualification training	% of group	% of total sample
New rider	215	13	6%	1.4%
Long-term rider	538	118	22%	12.3%
Returning rider	208	41	20%	4.3%

The types of voluntary course attended are shown in Figure 20. It may well be the case that a lack of awareness of voluntary training courses, and the cost of undertaking such, account for the low percentage of riders opting to advance or refresh their skills. In prompting awareness at the point of sale and removing costs, the development of this type of scheme across other motorcycle manufacturers would prove valuable in raising the skill levels of today's riders.

Figure 20: Voluntary courses attended by year of attendance
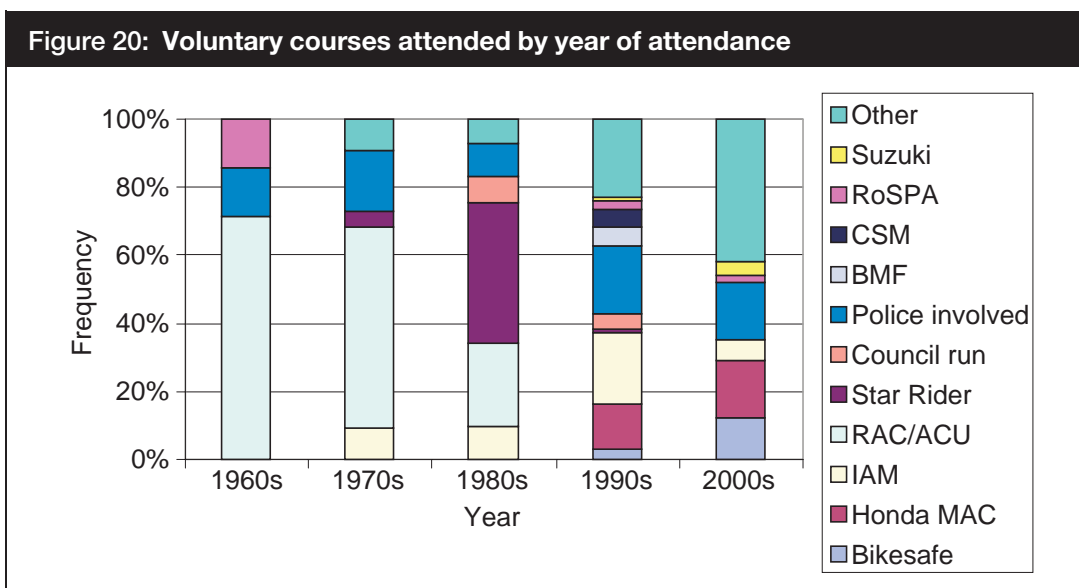
The majority of returning riders indicated that they undertook the course to refresh their skills following a break, rather than in response to incentives such as reduced insurance or free courses. These riders were perhaps aware that their handling skills and confidence could have diminished.

2.3.8 Accidents

A broad overview of accident involvement data was collected and is presented in the following tables, using the modal response. The data should be treated with caution, as these are purely frequencies and do not account for exposure. Twenty-five per cent of the riders had been involved in one accident or more during the last three years (Table 13).

Table 13: Distribution of accidents within the rider type groups			
No. of accidents	New rider	Long-term rider	Returning rider
0	69%	76%	79%
1	20%	17%	14%
2	4%	4%	5%
3	3%	1%	1%
4	1%	1%	–
5	2%	1%	–
% involvement in all reported accidents	29%	53%	18%

New riders were involved in slightly more accidents when compared to their counterparts. Returning riders seemed to be the least accident-involved group. Differences here, however, are marginal. Table 14 provides comparisons across accident type.

Table 14: Mean number of accidents by rider type and accident severity			
	New rider	Long-term rider	Returning rider
Serious injury	0.07	0.07	0.03
Slight injury	0.26	0.31	0.14
Damage only	0.26	0.22	0.12

Tables 15–17 provide insight into the nature of these reported accidents. However, although riders provided details of the number of accidents they had been involved in, the sections of the survey requiring the details of these accidents were often omitted and the following results are based on a reduced number of riders.[2] Although patterns of accidents across rider types and accident severity are not entirely consistent, there are some interesting differences and similarities to note. All accident types are concentrated in urban areas during the week and are generally in the afternoon or evening time.

---

2   Note that the respondents can appear as having more than one accident.

Table 15: Serious injury accident details by rider type

	New rider	Long-term rider	Returning rider
Road class	Urban	Urban	Urban
Familiarity with road (months)	22.00	14.17	10.00
Distance from home (miles)	35.00	28.03	12.50
Month	Oct.	May	Feb./May/Jul./Aug.
Year	2001	2001	2001
Time of day	pm	pm	pm
Time of week	Weekday	Weekday	Weekday
Trip purpose	Commuting	Leisure	Leisure
Group riding	n/a	n/a	n/a
Engine capacity (cc)	391.67	831.52	662.50
Experience (months)	17.33	25.28	25.00
What else was involved?	Moving vehicle	Moving vehicle	Moving vehicle
Who was to blame?	Other	Other	Other
Reported to police?	Yes	Yes	Yes

Table 16: Slight injury accident details by rider type

	New rider	Long-term rider	Returning rider
Road class	Urban	Urban	Urban
Familiarity with road (months)	22.06	21.50	15.37
Distance from home (miles)	45.05	20.64	49.67
Month	Apr./May/Sep.	Jan./Mar./Apr.	Jun./Oct.
Year	2001	2000	2001
Time of day	pm	pm	pm
Time of week	Weekday	Weekday	Weekday
Trip purpose	Commuting	Commuting	Commuting
Group riding	n/a	n/a	n/a
Engine capacity (cc)	254.26	704.22	686.70
Experience (months)	11.87	34.31	47.80
What else was involved?	Nothing else	Moving vehicle	Moving vehicle
Who was to blame?	Self	Other	Other
Reported to police?	No	No	Yes

Table 17: Damage only accidents by rider type

	New rider	Long-term rider	Returning rider
Road class	Urban	Urban	Urban
Familiarity with road (months)	19.50	19.21	13.76
Distance from home (mile)	11.04	15.18	166.89
Month	Feb./Nov.	Jun.	Jul.
Year	2001	2001	2001
Time of day	am	pm	am
Time of week	Weekday	Weekday	Weekday
Trip purpose	Commuting	Commuting	Commuting
Group riding	n/a	n/a	n/a
Engine capacity (cc)	378.96	705.90	669.53
Experience (months)	9.62	30.43	15.24
What else was involved?	Nothing else	Moving vehicle	Moving vehicle
Who was to blame?	Self	Other	Other
Reported to police?	No	No	No

The majority of accidents seem to take place on commuting trips, although the serious injury accidents were more common on leisure trips for the long-term rider and returning rider. New riders tended to be involved in serious accidents on their way to and from work. Since the data have established that new riders are more likely to use their motorcycle for commuting trips than any other rider type, it seems reasonable to expect that their accidents take place when commuting. Reported familiarity with the road would suggest that serious accidents tend to occur on less familiar roads, except for the new rider. Again, however, since the new riders' accidents are more frequent on commuting trips, this is not surprising.

Experience with the machine varied across accident types, but accidents tended to occur within two-and-a-half years of ownership. Most accidents appeared to occur over the drier, summer months, although new riders' serious injury accidents were most common in October. This difference across the time of month for serious injury accidents is perhaps a loose indication that the new riders' accidents occurring on commuting trips are related to aspects of the environment, such as more hazardous weather conditions, whereas the long-term and returning riders' serious injury accidents on leisure trips during the summer months may be related to the nature of their riding (e.g. the use of inappropriate speeds) and to the type of roads on which they ride (i.e. faster roads).

2.3.9 Patterns of ownership

This section of the survey was included in order to identify any changing patterns of motorcycle ownership. This was achieved by asking respondents to list the motorcycles they had purchased since they began riding.

Figure 21 shows the number of motorcycles our sample has owned since passing their tests. Over 50% have owned between one and five bikes, and nearly 20% have owned ten bikes or more.

As we were interested to see how ownership had changed over time, the sample was divided into the following categories:

- Those who purchased their first motorcycle during the 1950s (and before).

- Those who purchased their first motorcycle during the 1960s.

- Those who purchased their first motorcycle during the 1970s.

- Those who purchased their first motorcycle during the 1980s.

- Those who purchased their first motorcycle during the 1990s (and after).

Figure 21: Percentage frequency of total number of motorcycles owned
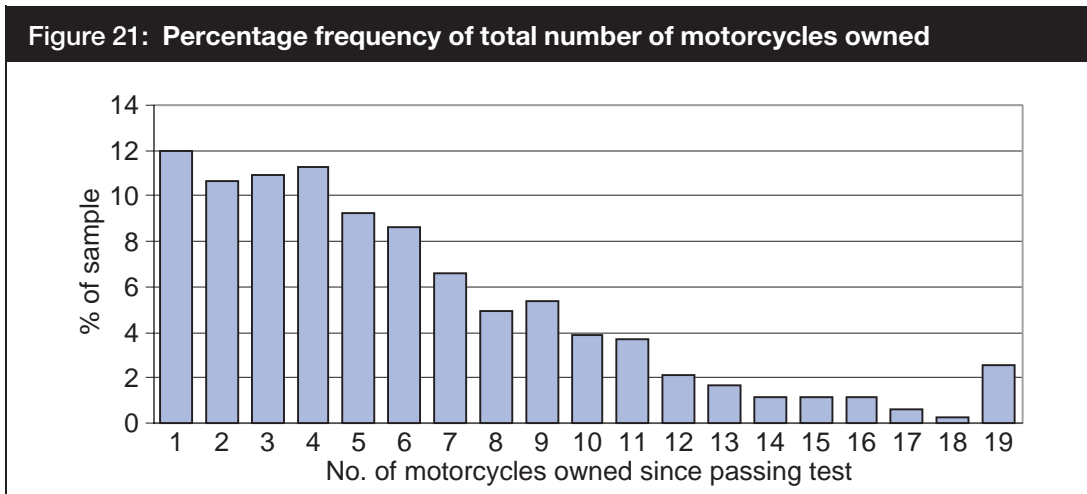
Allowing for missing data, this produced the distribution shown in Table 18. The data suggest that those riders who took up motorcycling 30 years ago were considerably younger than those who take it up presently.

Table 18: Stratification of sample by first bike purchase

Year purchased first bike	n	Mean age (years)
1950s and before	87	18.05
1960s	160	17.55
1970s	230	18.91
1980s	164	23.66
1990 onwards	291	31.95

2.3.9.1 Age of licensing

Figure 22 shows how the earlier cohorts gained their motorcycle licences at a younger age than the most recent cohort. For those who gained their motorcycle licence in the 1990s and after, there was a more widespread distribution of age.

Figure 22: Age of licensing for different cohorts (log scale)
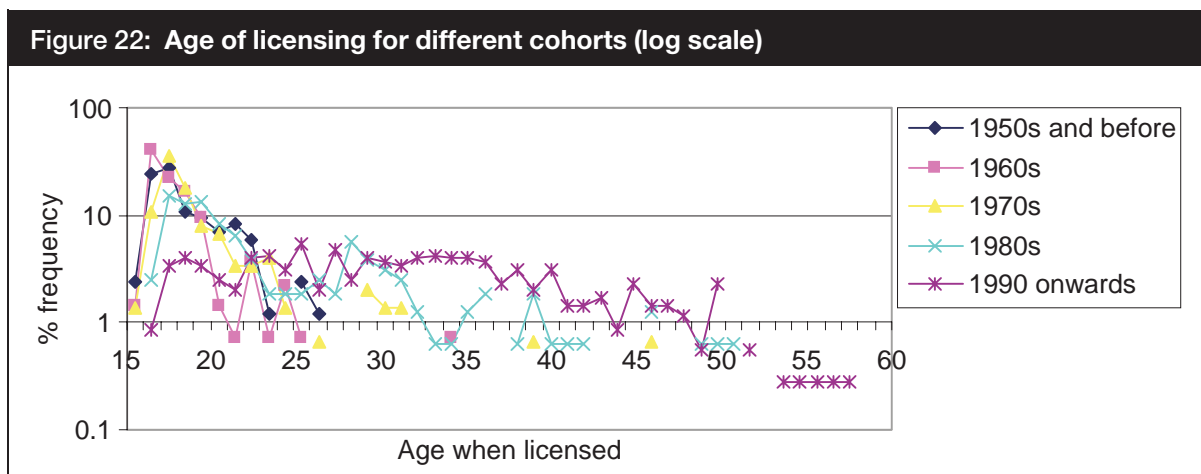
2.3.9.2 Engine size

The data were interrogated to provide an overview of how these motorcyclists progressed through the years in terms of the engine size of their machines. The average engine size was calculated for the first five bikes for each of the subsets outlined above and the results are shown in Figure 23.

Figure 23: **Pattern of motorcycle ownership by engine size**
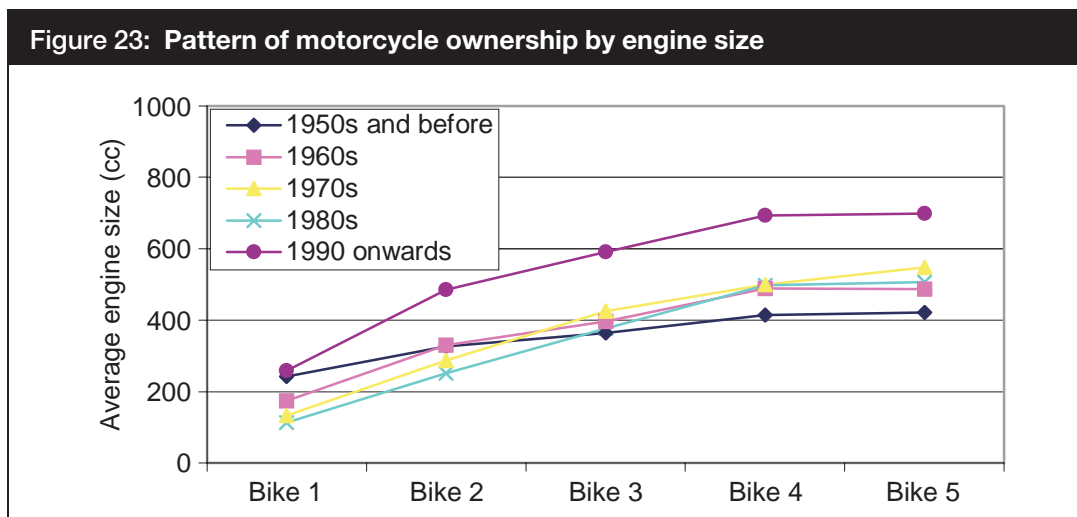
The graph clearly shows that, whilst the engine sizes of their first bikes are within a relatively small range, the 1990s onwards cohort show a much steeper incline in engine size as their ownership matures. By the time these riders have purchased their fifth bike, their average engine size is substantially higher than those of the other cohorts.

2.3.9.3 Motorcycle turnover

Using the same cohorts as above, the turnover of motorcycles was calculated. Thus for each rider, a calculation was made of the number of years they owned each of their first five motorcycles. The results are shown in Figure 24. For the 1950s cohort, it appears that they owned each of their machines for nearly twice as long as subsequent cohorts. For these later cohorts, the data suggest that the turnover of their first machine is quicker than that of the subsequent ones, presumably due to licensing regulations and the desire to 'move up the ranks'.

Figure 24: Number of years of ownership
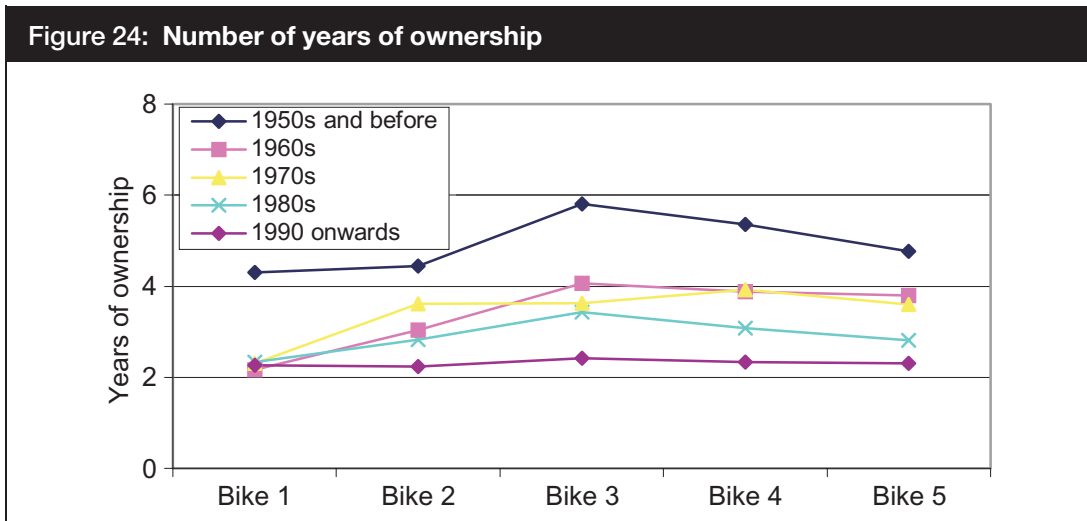
The most recent cohort, however, shows a deviation from this pattern in that, whilst turnover of their first machine is comparable to that of earlier cohorts, subsequent machines are replaced just as quickly – hence the flat line which represents their data. Recently recruited riders therefore not only choose to ride higher capacity machines but also progress to these machines much quicker than those riders who started riding in previous decades. This could have implications in terms of the amount of riding experience relatively new riders accumulate before progressing to the higher engine capacity machines.

An alternative way of looking at the data is to consider the sample by rider type (as defined earlier). This allows investigation of those riders who return to motorcycling after a significant break, and who purchase large machines which could be unsuitable for their 'rusty' skills. Thus, a comparison was made between engine sizes of bikes owned before a break from the activity, compared to the engine size of the machine purchased when the rider returned to the activity. Sixteen per cent of riders purchased a machine with a lower engine capacity compared to the one they had before the break. A high proportion of riders (35%) chose one which was nearly the same in engine capacity. However, a significant proportion (nearly 20%) purchased a machine that was at least 500cc larger than the bike which they had owned before their break.

2.3.9.4 Reasons for changing motorcycles

The culture and image of motorcycling has evolved over the last decade, with an increase in motorcyclists who use the activity as a hobby or as an expression of their lifestyle, rather than just a method of transport. In this survey, motorcyclists were given the opportunity to state why they chose their particular machines. Following piloting, a list of 20 reasons for buying a motorcycle and 16 reasons for getting rid of a motorcycle was presented in the survey. The five most popular reasons for purchasing their **first** motorcycle were calculated for each of the five cohorts. Then

the same calculation was made for each rider's **third** motorcycle. The data are presented in Figures 25–29 below.

In the 1950s, 60s and 70s the data suggest that new riders purchased their first motorcycle for reasons of independence – as they were too young to drive a car they purchased a smaller machine with a restricted engine size. By the time these riders had purchased their third bike (approximately eight years later – see Figure 24) their reasons were more to do with the type of activity that riding had become to them. These riders were now enjoying riding for leisure, and fun and engine capacity were much more important features. In the 1980s, whilst purchasing decisions for one's first bike remained almost identical to those of earlier cohorts, subsequent decisions were based much more on aspects of styling (Figure 28).

Figure 25: Reasons for purchasing motorcycle (1950s cohort)

1st bike

- Other 11%
- Independence 32%
- Lower running costs 11%
- Leisure activity/fun 13%
- Too young for car 33%

3rd bike

- Top speed 10%
- Leisure activity/fun 30%
- Preferred manufacturer 16%
- Lower running costs 20%
- Engine capacity 24%

Figure 26: Reasons for purchasing motorcycle (1960s cohort)

1st bike

- Leisure activity/fun 12%
- Lower running costs 13%
- Too young to drive car 37%
- Restricted cc 17%
- Independence 21%

3rd bike

- Independence 15%
- Leisure activity/fun 27%
- Preferred manufacturer 16%
- Extra transport 16%
- Engine capacity 26%

Figure 27: Reasons for purchasing motorcycle (1970s cohort)

1st bike

Lower running costs 10%
Leisure activity/fun 14%
Restricted cc 29%
Independence 22%
Too young for car 25%

3rd bike

Top speed 12%
Leisure activity/fun 25%
Styling 20%
Preferred manufacturer 23%
Engine capacity 20%

Figure 28: Reasons for purchasing motorcycle (1980s cohort)

1st bike

Leisure activity/fun 7%
Independence 11%
Restricted engine size for learner rider 44%
Lower running costs 15%
Too young to drive car 23%

3rd bike

Preferred manufacturer 14%
Styling 28%
Top speed 18%
Engine capacity 21%
Leisure activity/fun 19%

Figure 29: Reasons for purchasing motorcycle (1990s cohort)

1st bike

To avoid congestion 14%
Restricted cc 37%
Leisure activity/fun 14%
Styling 15%
Lower running costs 20%

3rd bike

Touring capability 14%
Top speed 28%
Preferred manufacturer 14%
To avoid congestion 18%
Styling 26%

Our 1990s cohort appears to be substantially different to earlier cohorts with respect to both their first bikes and subsequent purchases (Figure 29). First bikes are now much more likely to be purchased for reasons of lower running costs and avoiding congestion. For the first time, though, styling was also ranked as an important consideration for one's first purchase. By the time these riders have moved on to purchase their third bike (approximately four years later – see Figure 24), issues of top speed and styling are ranked as the most important factors in their decision making. The avoidance of congestion is still ranked relatively highly.

2.3.10 Who owns the big bikes?

The regression analysis was carried out to identify which riders (in terms of demographics etc.) ride which type of bike (in terms of engine size). The STATS19 data presented earlier demonstrated that fatal motorcycle accidents are more likely to involve large machines. This analysis thus provides the ability to target certain motorcycle owners, in order to reduce the numbers of fatal accidents.

Six hundred and ninety three riders (age range 17–76 years) were entered into the regression model. Descriptive statistics present the average rider as a 41-year-old married (or living with partner) male without any children living at home. His average income was £20,000–£24,000 and he is an employee within a small organisation or is self-employed. Owning a motorcycle with a 652cc engine capacity, this average rider had just over five years' riding experience, tended to have a car driving licence and was unlikely to have attended a voluntary training course. Correlation analysis highlighted several highly significant positive relationships between engine capacity and:

- age;
- income;
- National Statistics Socio-economic classification (NS-SEC) analytic class;
- experience;
- marital status;
- attendance on voluntary training course;
- long-term riders;
- leisure only riders; and
- riders who had gained a full driving licence.

Highly significant negative relationships were also observed between engine capacity and:

- gender; and
- commuter only riders.

Put simply, older, married, car driving, more experienced, male, long-term, leisure only riders, who had attended voluntary motorcycling training courses, earned a higher income and fell into a higher NS-SEC, tended to own motorcycles with a larger engine capacity.

Stepwise linear regression was then carried out to examine the contribution of the variables to the prediction of engine capacity. Table 19 shows the results. Age, experience and whether the rider was married, had dependent children or was educated above secondary school level did not predict engine capacity and were excluded from the regression model. Overall the model performed well, predicting 33.7% of the variance in engine capacity.

Table 19: Stepwise regression to predict engine capacity					
Predictors	Unstandardised coefficients		Standardised β	t statistic	Sig.
	β	St. error			
(Constant)	343.92	79.59	4.32	0.000	
Sex	202.80	41.39	−0.17	−4.90	0.000
Commuter or not	229.78	36.10	−0.21	−6.36	0.000
NS-SEC	23.96	6.07	0.15	3.95	0.000
Long-term rider or not	194.17	30.63	0.27	6.34	0.000
Returning rider or not	136.16	36.46	0.15	3.74	0.000
Car licence or not	119.01	45.27	0.09	2.63	0.009
Voluntary course or not	88.30	29.51	0.10	2.99	0.003
Income	10.51	4.58	0.09	2.29	0.022
Leisure rider or not	60.37	26.82	0.74	2.51	0.025
Multiple R = 0.580, R^2 = 0.337, adjusted R^2 = 0.328, F ratio = 38.498, F sig. = 0.000					

The resulting regression model suggested that those riding the higher capacity motorcycles tend to be:

- male;

- long-term or returning riders;

- riding mostly for leisure purposes;

- those who tend to attend voluntary motorcycling training courses;

- also drive a car;

- fall into a higher NS-SEC analytic class; and

- earn a higher income.

2.4   Conclusions

This survey was carried out in order to establish the characteristics of a sample of the UK motorcycling population and to discover whether there exists a stereotypical 'Older Motorcyclist'.

2.4.1   *The changing nature of motorcyclists – does the Older Motorcyclist exist?*

The retrospective component of the survey provides the most detail about the changes that have occurred in the motorcycling population over the last few decades. This retrospective analysis of our sample's motorcycle history revealed a number of interesting issues. It allowed the exploration of patterns of ownership, and whether this has changed over the years. The first observation was that the age at which riders gain their motorcycling licence (and purchase their first bike) has changed steadily over the years: those who gain their licence nowadays are, on average, 13 years older than their counterparts in the 1970s.

Secondly, whilst the engine size of first bikes purchased remains relatively stable across the cohorts, those who purchased their first bike in the 1990s onwards show a much steeper incline in engine size as their ownership matures. That is to say – recent recruits to the activity tend to move up through the motorcycle ranks much quicker than their more established counterparts.

In addition, more recently recruited riders progress to these higher capacity machines much quicker than those riders who started riding in previous decades, i.e. the turnover of machines has become more frequent. Thus we have a cohort of riders who have progressed to large capacity machines relatively quickly, without the same build up of skill that was previously allowed for.

As a way of understanding the reasons behind taking up motorcycling, riders were asked to choose their reasons for purchasing their first motorcycle and subsequent motorcycles. Those who purchased their first bike in the 1950s, 60s and 70s did so for reasons of independence, as they were too young to drive. Further down the line, these riders started purchasing their motorcycle for reasons of fun, and engine capacity was much more of an important feature. During the 1980s, purchasing decisions for one's first bike remained almost identical to those of earlier cohorts, but subsequent purchasing decisions were based much more on aspects of styling. The most interesting feature of the data was gleaned from the 1990s cohort – first bikes are now much more likely to be purchased for reasons of lower running costs and the avoidance of congestion. Styling is also ranked as an important consideration when considering one's first purchase. By the time these riders purchase their third bike, issues of top speed and styling are ranked as the most important factors in their decision making.

2.4.2. How can motorcyclists be categorised for the purposes of interventions?

2.4.2.1 Using rider characteristics

Simply grouping motorcyclists into age categories was thought to be less useful than taking into account experience and exposure. These two latter variables allowed us firstly to categorise riders based on whether they had taken breaks from motorcycling or were taking up motorcycling at a later age, and secondly took into account the types of riding that they engaged in.

The respondents to this survey were categorised into three basic types (new, long-term and returning riders). Looking at the data presented in the owner characteristics section, one can generally say that those riders who have returned to motorcycling after a break share more in common with riders who have been riding continuously, than with new riders. However, the age distributions between the two groups were statistically different, with those returning to riding having a slightly higher mean age (49 years) than those who have not taken a break (46 years). More significantly, however, the actual shape of the age distributions differs, with a 'bunching' of returning respondents around the 40s and 50s age mark.

This high proportion of new and returning riders, and the age distribution of the latter, could have a number of implications. Firstly, this means that the UK roads currently have a significant proportion of motorcyclists who could either be using newly learned skills or be relying on skills that were formed some years ago and that could have subsequently degraded through non-use. Without scientific evidence about the development and/or loss of motorcycling skills, it is difficult to say what impact this may be having on road safety. A second consideration, and taking into account existing research that claims that car drivers are at fault in a large proportion of urban accidents involving motorcyclists, is that the average car driver may not have developed the skills required to share the road with their two-wheeled counterparts. On the positive side, however, there is some evidence that the development of hazard perception skills gained as a result of motorcycling experience carry over to the driving situation (Horswill and Helman, 2002).

With regard to other demographic variables, the long-term and returning riders demonstrate a fair amount of similarity. Domestically, both groups are much more likely to be married with fewer dependent children – probably a direct effect of the higher ages in these groups. The only slight difference was that the long-term riders were more likely to be single than the returning riders.

Using this categorisation, we examined the take-up of existing voluntary training. Nearly one-fifth of our sample had attended one or more voluntary training courses. However, most of these were the long-terms riders, and there would thus appear to be scope in encouraging returning riders to increase their attendance at such sessions. It is interesting to note that the Honda Motorcycling Appreciation Courses (MACs) are

popular since provision of this course is free with the purchase of a Honda motorcycle of 600cc or above. It may well be the case that a lack of awareness of voluntary training courses and the cost of undertaking such courses account for the low percentage of riders opting to advance or refresh their skills. In prompting awareness at the point of sale and removing costs, the development of this type of scheme across other motorcycle manufacturers would prove valuable in raising the skill levels of today's riders. It is encouraging to note that the majority of returning riders undertook the course to refresh their skills following a break, rather than in response to incentives such as reduced insurance or free courses. These riders were perhaps aware that their handling skills and confidence could have diminished. However, since those riders not undertaking voluntary training courses are of more concern, the types of incentives and pressure groups identified could prove persuasive additions to safety campaigns that have previously centred on promoting the improvement of skill. Indeed, conversations with local enforcement agencies suggest that one way in improving the efficacy of training programs would be to invite the families of fatal accident victims along to the course in order to share their experiences. Presumably this would be aimed at riders with partners and children.

The explanation for those having attended a voluntary training course owning larger engine motorcycles is unclear. It is not possible to say whether riders attending courses went on to buy larger engine motorcycles or whether riders already owning large engine motorcycles enrolled on these courses. Indeed, the popularity of the Honda MAC scheme, which provided free courses to those buying machines of 600cc or above, questions the importance of this characteristic as a predictor.[3] Nevertheless, it is reassuring that motorcyclists handling the larger machines are more likely to complete training courses to improve and refresh their skills.

2.4.2.2 Using journey purpose

Another aim of the survey was to discover for what purpose riders used their bikes, as there has been a suggestion that there is an increasing number of riders who use their machines for leisure purposes only. The sample was therefore partitioned into sub-categories based on their self-reported trip types. Riders were categorised as being commuters, leisure riders or a combination of both. Whilst most riders claimed to make both leisure (no purpose) and commuting trips – 57% of the sample – there was a high number of motorcyclists who claimed to engage only in leisure trips (30%). There is thus a high proportion of motorcyclists on the UK roads who are riding for no other reason than the fact that they enjoy the activity.

There are a number of characteristics of these leisure riders that set them apart from the rest of the motorcycling population. To begin with, leisure riders are mostly either long-term riders or returning riders; returning riders were more likely to be leisure riders than any other type of rider. Secondly, they tend to own larger

---

3   The Honda MAC scheme is no longer available.

machines than commuter riders, and these are mostly supersports bikes. Nearly 80% of leisure riders own and ride machines over 500cc, compared to only 30% of commuting riders.

This is confirmed in our analysis of riders' reasons for purchasing their current motorcycle. As well as a general 'love of motorcycles' and the opportunity it affords for 'independence and freedom', riders express their purchase of their current machine as a desire to 'engage in leisure activities' and to indulge in 'image association'. Indeed, Cooper and Rothe's (1988) discussion of the role of imagery in motorcycling suggests that 'the motorcyclists' self is an extension of other perceptions' (p.79). Motorcyclists are often seen as risk takers and many riders discussed sexual identification in relation to self-image. Motorcycling is commonly stereotyped as a risky and 'sexy' activity – an image that returning riders would appear to aspire to. The long-term rider, on the other hand, bases purchasing decisions upon a motorcycles appropriateness for 'engaging in a leisure activity' but does not rank the importance of image highly. Motorcycle maintenance is instead ranked highly, and it may be the case that the long-term rider is more enthusiastic about using their motorcycle as a form of leisure activity and as a machine to learn about and modify rather than as a commodity to reflect their status. What is not known however is whether this penchant for 'motorcycle maintenance' reflects the rider's desire to keep their machine in safe working order or a tendency to modify their machine in order to gain significant improvements in speed and power. Each has very different implications.

Returning to the idea of the changing nature of motorcycling and how there appears to be an increase in leisure associated activities, the survey also investigates patterns of usage over the months of the year. These data showed that all riders generally increased their usage in the summer months for commuting trips. This also held true for leisure trips, although the number of trips made by returning riders peaked more dramatically than the other groups in the months of June to August. Indeed, leisure riders reported dramatic increases in use in these summer months. This would be, therefore, an ideal time to target any campaigns to improve driver knowledge or awareness, when the proportion of fair weather, returning riders is at it highest on the road.

Another aim of the survey was to explore the nature of leisure riding for all categories of riders. Riders appear to prefer aesthetic roads with wide sweeping curvature and impressive views. The existence of other traffic on the roads is seen as an interruption, and they prefer to engage in these rides on fine and dry days. These conditions contribute to the enjoyment of leisure rides with regard to the exhilaration and independence that is experienced. These rides are also more likely to be undertaken at weekends.

Some leisure rides involve 'group riding'. The motorcyclist is often viewed as having an attitude to life that separates them from the majority of mainstream

society. Whilst all riders are unified in their 'love of motorcycles', the strength of membership to this group and adherence to this 'way of life' is diverse. Different groups of motorcyclists are clearly recognisable and, as Cooper and Rothe (1988) point out, these groups can range from the highly organised motorcycle gangs to the passing riders who meet and greet each other on the roads. Membership to organised groups undoubtedly serves to emphasise a rider's commitment to motorcycling, and labels the individual rider with the images and attributes that personify the group as a whole. Conversations with Essex and North Yorkshire Police Authorities highlighted concerns regarding the incidence of accidents involving group riders. A significant proportion of riders involved in accidents appeared to be either leading or trailing at the back of a group. Our survey revealed that half of our respondents engaged in group rides, and that these were mostly undertaken on a leisure basis. On average, the long-term rider rode with larger groups (15 other riders), with the returning rider tending to ride in groups with 11 other motorcyclists. The new rider rode in much smaller groups of six or so. This may reflect the new rider's inexperience and lack of confidence to ride and 'keep up' with large groups of potentially experienced and skilled riders.

2.4.2.3 Using engine size

An alternative way to target interventions is to establish which bikes (and hence riders) and more likely to be accident involved. Sexton *et al*. (2004) found that once mileage, age and experience had been allowed for, riders of bikes over 125cc had accident liabilities 15% lower than riders of smaller bikes. However, Broughton (1988) reported that fatalities increased with increasing bike size: the rate for motorcycles over 250cc was twice the average rate. This result has also been found in other countries: e.g. in the USA a trend has been noted such that the engine size of the majority of the motorcycles involved in fatal crashes has been increasing. The mean engine size of motorcycles involved in fatal crashes increased from 769cc in 1990 to 959cc in 2001 – an increase of 24% (Shankar, 2001). Given that larger machines travel at higher speeds (and they are perhaps more likely to carry pillions), this increase in fatality rates is logical. Of course the increases in average engine size could also be having an impact here. Lynam *et al*. (2001) found that although riders of larger machines were generally more experienced, they were more likely to use the greater power, travel at excess speed and consequently lose control. They found this to be particularly true for fatal accidents on bends and winding rural roads.

With regard to the data collected in this survey, it was the long-term and retuning riders who mostly own motorcycles with engines exceeding 500cc. There were few differences when comparing these two groups, suggesting that even those riders who have been away from the activity for a number of years ride machines that are comparable to those being ridden by the long-term riders.

The regression analysis aimed to identify which riders (in terms of demographics etc.) ride which type of bike (in terms of engine size). This provides the ability to target certain motorcycle owners, if required. The data support the qualitative observations drawn from each section of the survey. The tendency to own a larger engine motorcycle seems to depend very much upon the individual's wealth and the way in which they utilise their machine.

Those riders earning a higher wage and holding a senior position of employment tend to own the larger engine motorcycles. In light of today's increasing insurance premiums, the relationship is simple. It is only those motorcyclists with the available money and employment stability that can afford to buy these high-capacity machines. It is more interesting that it is the long-term rider and the returning rider that are more likely to be earning higher incomes and hold such positions of employment. Long-term and returning riders are statistically more likely to own a larger engine machine and previous comparisons across rider types suggests that they are more likely to be leisure only riders. The rider's tendency to engage in motorcycling as a leisure activity and have the income available to pursue such activity seems to link the predictors of engine capacity. Those buying these larger engine motorcycles are doing so for the purpose of leisure riding. The higher capacity motorcycle is not bought as a means of getting from A to B, a convenient and economical form of transport, but as an 'instrument of pleasure'. The larger motorcycle offers the opportunity for individuals to take part in a leisure pursuit that cannot be enjoyed on the smaller machines. Whether the appropriateness of the larger engine motorcycles is a reflection of the power of these machines, the associated image or simply the hauling capability of these machines is unknown, since even the largest motorcycles can have relatively modest power. Previous data would suggest, however, that a little of all these factors influence decisions to buy these motorcycles. The importance of the gender of the rider and whether or not a rider owns a full driving licence is also probably best understood in terms of the way in which an individual utilises their machine. National Travel Survey data suggest that males are more likely to make leisure trips and that females are more likely to make commuting trips. Similarly, those individuals who did not own a full driving licence tended to be new riders. New riders were more likely than any other rider type to use their motorcycle for commuting trips. It seems it is these variables which can identify likely leisure riders, who, in turn, are more likely to own the larger capacity motorcycles.

A motorcyclist's experience comprises not only of their current bike, but also the bikes they have ridden in the past. The survey therefore also asked respondents about previous bikes owned and the amount of experience gained on each of them. This analysis provided some interesting results: the most striking of which concerned the increase in the engine size that returning riders demonstrated (when compared to the motorcycle they were using just before their break). Thus we have a sample of the motorcycling population who are not only possibly relying on skills that may have degraded, but who are also prepared to use these skills with machines

that have a substantially larger engine capacity (compared to riders who have been riding continuously).

2.4.3 What keeps a motorcyclist motorcycling?

When riders were asked what would make them give up motorcycling, new riders ranked a 'rise in insurance prices' as their main reason for giving up and ranked a 'serious accident' as less influential. Considering that new riders mostly use their motorcycles for commuting trips and base their purchasing decisions on economical and convenience reasons, it follows that increases in insurance ranked highly in their reasons for giving up. Involvement in a serious accident is perhaps something that the new riders do not readily associate with commuting trips. The injury severity of an accident is associated with speed at impact and, since congested urban traffic allows less opportunity for such speeds, the perceived threat of a serious accident may be lost. This threat is not overlooked by the long-term and often leisure-only rider. It is surprising that the returning riders also rank a rise in insurance prices as a dictating factor in their retirement from riding. This group were consistently portrayed as the most affluent rider type, having higher incomes, disposable income and holding more senior positions of employment. The ranking of family-related reasons above age-related factors is also confusing when the age of this group and their family is considered. As might be expected, however, retired riders ranked a serious accident as the most important factor leading to their departure from the motorcycling population.

The survey also explored the accident involvement of the respondents. It should be noted, however, that at the time of writing a more in-depth study on motorcycling accidents is being carried out by the Transport Research Laboratory (TRL). It was beyond the scope of this project to attempt anything more than an overall view – indeed the sample of accidents obtained (due to them being relatively rare events) is not sufficient to draw robust conclusions. Overall, one-quarter of our respondents were involved in one or more accidents during the last three years. Most commonly, these were concentrated in urban areas and seem to take place on commuting trips in the afternoon and evenings, although serious injury accidents were more common on leisure trips for both the long-term and returning riders. In addition, the returning rider reported being the least familiar with the road on which the accident occurred.

2.5 Summary

Ultimately, the nature of motorcycling appears to be changing. There is evidence for the 'Older Motorcyclist' in that more riders are taking up motorcycling at an older age. In addition, the rise in sales of motorcycles over 750cc and the regression analysis support the idea that motorcycling is establishing itself as a leisure pursuit indulged by those with the necessary income to buy the ideal motorcycle and meet the rising insurance premiums.

The important points to note from this survey are:

- New recruits to the UK motorcyclist population are older than in the past.

- The year-on-year increase in the number of new riders and returning riders taking up motorcycling since 1996 coincides with the observed rise in accident rate.

- These new riders are more likely to own the smaller capacity motorcycles, relying on their machine as their main form of transport, particularly for commuting trips.

- The returning riders are statistically more likely to own the higher engine capacity motorcycles.

- Of these returning riders, nearly 20% returned to motorcycling with a machine that was at least 500cc larger than the motorcycle that they had owned before their break, despite a possible decline in their handling skills.

- Despite this possible degradation in skill, returning riders formed only 24% of those riders who had completed a voluntary training course.

- The most popular training schemes were police-involved with local authority backing, especially those that were free of charge and were offered at the point of sale of a motorcycle.

- Retrospective data suggested that riders recently taking up the activity tend to progress to the larger capacity motorcycles faster than their counterparts and they placed much more importance on styling and top speed.

- The data provide evidence for the changing nature of motorcycling, in that it is becoming more of a leisure activity, especially given that 30% of the sample were leisure only riders.

- Leisure riders tended to be long-term and returning riders and own the larger capacity machines. The increased income, disposable income and employment position of these riders is likely to account for their opportunity to indulge in leisure riding.

- The exploration of the basis of purchasing decisions supports this shift in the nature of motorcycling, highlighting that riders buy machines that are appropriate for leisure riding.

- Leisure riders' presence on roads dramatically increases during summer months, coinciding with local data noting increases in the number of accidents over this period.

3 SURVEY TWO: WHO ENGAGES IN RISKY RIDING?

3.1 Aim of the survey

The aim of this survey was to identify a set of common risky riding behaviours and to explore the demographic and personality factors influencing riders' intentions to engage in such behaviours. Of interest was to discover whether the Older Motorcyclist engaged in these risky riding behaviours any more than their younger counterparts. If so, this could be one of the reasons for the rise in accident numbers in this age category. Over the last decade the Theory of Planned Behaviour (TPB: Ajzen, 1985) has emerged as a potentially useful model on which to base road safety campaigns. The model states that intentions are influenced by three factors: attitudes, subjective norms and perceived behavioural control (PBC).

Attitudes towards the behaviour reflect the degree of positive or negative evaluation the individual has towards performing the behaviour, **e.g. I think exceeding the speed limit is exhilarating**.

Subjective norms refer to the perceived social pressure to engage or not engage in the behaviour. This reflects what one's 'important others' would think about the behaviour and how important one thinks their opinions are, **e.g. My family would disapprove of me exceeding the speed limit.**

PBC reflects the perceived ease or difficulty of undertaking the given behaviour. These 'control factors' can be internal or external, **e.g. If I wanted to, I could easily exceed the speed limit (internal factor) and I ride on the motorway when the weather is fine and dry (external factor).**

Several studies have applied the TPB to aberrant driving behaviours, including drivers' propensity to speed (e.g. Lawton *et al.*, 1997), dangerously overtaking (e.g. Parker *et al.*, 1992a) and drink-driving (Parker *et al.*, 1992b). To date, however, little work has researched the application of the TPB to aberrant motorcycling behaviour. This survey examines the predictive utility of the TPB with respect to riders' intentions to engage in risky riding behaviour. A copy of the survey can be found in Appendix 2.

3.2 Survey content and administration

The survey originally intended to focus on the older motorcyclist examining whether this group differed in their attitudes and intentions to engage in risky riding behaviour and the potential influence of other factors such as exposure and engine size of their current motorcycle upon such behaviour. However, as in the previous

survey, this was not possible, so motorcycle engine size was again used as stratification. Using the total number of licensed motorcycles by taxation class, a stratified sample was requested from the DVLA (Table 20).

Table 20: Sample requested from the DVLA	
Engine size	**N**
<50cc	5300
51cc–150cc	5900
151cc–200cc	500
201cc–250cc	1200
251cc–350cc	300
351cc–500cc	2200
501cc+	14,900
Total	*30,300*

The survey was distributed to 30,300 registered keepers of motorcycles. Steps were taken to ensure the sample was exclusive of those participating in our previous survey. The survey was professionally printed into an A4 booklet. A cover letter was included which explained the nature of the research and requested respondents to return the survey by a specified date in the freepost envelope provided.

3.2.1 Demographics and motorcycle ownership

Several items sought key information regarding the respondents' age, sex, marital status, number of dependent children, personal gross annual income and monthly disposable income. Employment details were used to classify riders according to the self-coded version of the National Statistics Socio-economic Classification (NS-SEC) scheme. Items also sought details regarding the riders' motorcycle type, engine size, riding habits, riding experience, annual mileage, and type of motorcycle and driving licence.

3.2.2 Risk and accidents

Several items were used to establish riders' risk perception. Comparative risk was assessed whereby riders were asked to judge the likelihood of their being involved in an accident compared to other groups of road users. In addition, perceived absolute risk was measured and compared to actual levels of risk (calculated using Road Accidents Great Britain 2001).

An accident questionnaire developed by the Transport Research Laboratory (TRL) for a recent motorcycling accident analysis was also included within this survey. Items here sought details of the last three accidents a rider had been involved in during the previous 12 months. Items included details of the road type, road conditions, injuries sustained, damage to vehicles, trip purpose, motorcycle type,

time of accident and blameworthiness. The present study only reports data on the most recent accident reported.

There is also a considerable body of evidence that examines the relationship between the personality construct of sensation seeking (SS) and risky driving behaviour. A meta-analysis by Jonah (1997) concluded that of the 40 studies reviewed, the majority showed positive relationships between SS and risky driving, especially for men. The Arnett (1996) Sensation Seeking Scale was used, providing a short 20 item questionnaire asking respondents to rate how likely each statement described them. This allowed the testing of the hypothesis that those who engage in risky riding are sensation or thrill seekers.

3.2.3 TPB questionnaire

The TPB was applied to seven risky riding behaviours. When selecting these behaviours it was important to identify both contexts (e.g. road conditions) in which motorcycling accidents commonly occur and the actions/behaviours of the motorcyclists (e.g. travelling fast) which contribute to accident involvement. An extremely useful database for the selection of risky motorcycling behaviours was that collected by the TRL with funding from the DfT (Elliot *et al.*, 2003b). The extent to which 32 behaviours could distinguish between accident-involved and non-accident involved motorcyclists was tested statistically, using the frequency data (see Appendix 3). All behaviours were related to accident involvement in the same direction, i.e. the greater performance of each is related to greater accident involvement. Eighteen of these behaviours were significantly related to accident involvement and represented intentional actions. Following further discussions with the TRL, police forces and the University of Nottingham (also involved in an ongoing DfT funded motorcycling accident analysis), we developed seven scenarios relating to:

- speeding;
- close following;
- going for it;
- lack of awareness;
- riding into a corner;
- drink-riding; and
- group riding.

A photograph depicting the type of road described was provided to encourage the respondent's visualisation of the scenario and key TPB measures were presented to the respondents. They were required to circle the most appropriate response on

bi-polar anchored scales. Given the lengthy nature of each TPB questionnaire, each respondent received only three scenarios.

3.3   Analyses

Descriptive statistics are first provided to give a general view of the sample in terms of demographics and motorcycle ownership. Then, hierarchical regression analyses were undertaken to predict riders' intentions to engage in the seven risky riding behaviours. These regression analyses included demographic variables (age, gender etc.), motorcycle characteristics (engine size etc.), TPB measures (attitudes, PBC etc.) and the additional measures of SS and risk perception.

The regression modelling differentiated between those riders who intended to engage in the behaviours and those who did not. 'Intenders' were defined as those riders who tended to agree that they would intend, plan and want to engage in the behaviour. In order to examine any systematic differences between these two groups of riders, statistical comparisons were made across key TPB measures.

3.4   Results

3.4.1   Response rate

In all, 4929 riders responded to the survey, representing a 16% response rate. At the time the survey was conducted, 4757 respondents (97%) owned a motorcycle. The analyses focused on these 4304 males[4] (age range 16–85 years, M = 44.65, SD = 11.89) and 437 females (age range 16–77 years, M = 39.13, SD = 12.92). In order for a respondent to be included in the TPB analysis, they had to provide responses to all items, therefore the number of riders included in the analysis varies throughout.

The survey was reasonably successful in acquiring a representative sample of the UK motorcycling population (Table 21). However, those riders owning larger capacity machines were somewhat over-represented.

---

4   16 riders did not provide age/gender details.

Table 21: Requested and achieved samples					
Engine size	UK population (%)	Number requested	% of sample	Number achieved	% of sample
<50cc	17.05%	5300	17.49%	341	7.17%
51cc–150cc	19.47%	5900	19.47%	506	10.63%
151cc–200cc	1.57%	500	1.65%	70	1.48%
201cc–250cc	4.59%	1200	5.66%	171	3.59%
251cc–350cc	1.09%	300	0.99%	48	1.01%
351cc–500cc	7.50%	2200	7.26%	382	8.03%
501cc +	48.73%	14,900	49.17%	3239	68.09%
Total	*100*	*30,300*	*100*	*4757*	*100*

3.4.2 Classification of the motorcyclists

In order to provide comparable results, riders were classified on the same basis as our previous survey. Using data supplied regarding their number of years of riding experience and whether they reported taking a break of ten years or more, riders were classified as new (n = 1127), long-term (n = 2518) or returning (n = 1091) riders. An additional classification was used based on the type of motorcycling activities the sample engaged in. Riders were asked to report the main purpose of trips for which they use their motorcycle and were then classified as 'commuter only' riders (n = 1094), 'leisure only' riders (n = 1940), 'multi-use' riders (n = 1575) and 'miscellaneous' riders (n = 121).

3.4.3 Demographics

Of the 4754 respondents, 90% were male (Table 22). Twenty-four per cent of the sample were new riders, 53% were long-term riders and 23% were returning riders.

Table 22: Distribution of rider type by gender						
	Male			Female		
	n	%	% of total sample	n	%	% of total sample
New rider	877	20%	19%	246	57%	5%
Long-term rider	2370	55%	50%	137	32%	3%
Returning rider	1039	24%	22%	51	11%	1%
Total	**4286**	**100%**	**91%**	**434**	**100%**	**9%**
Total			*4720*			

Figure 30 shows the age distribution of the sample. The mean age of respondents was 42 years.

Figure 30: Age distribution of the sample
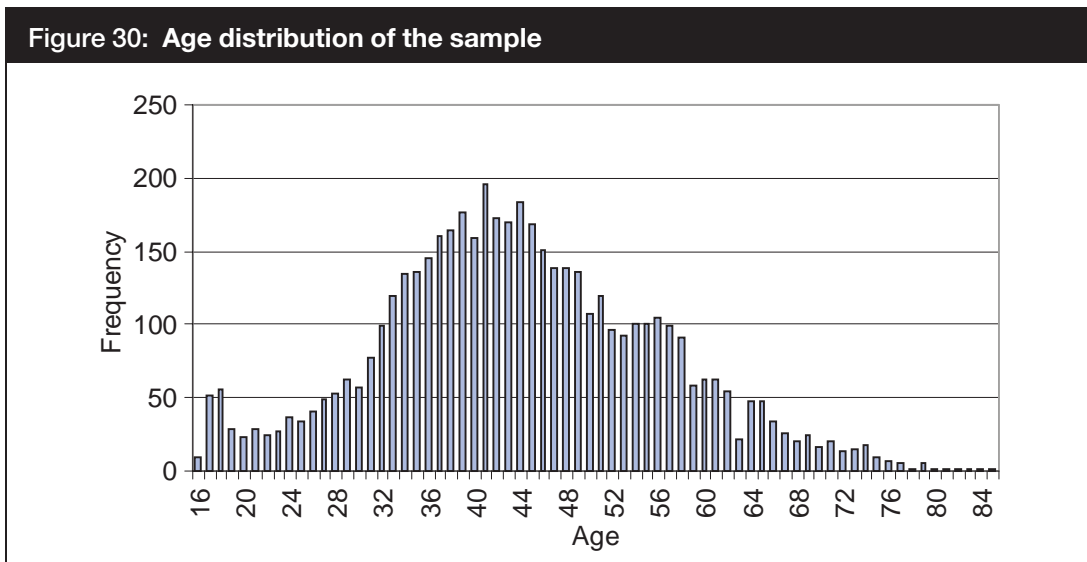
Table 23 shows that new riders have the lowest mean age and that there is little difference between the long-term and returning riders.

Table 23: Riders' age by rider type

	Male				Female			
	Mean	**SD**	**Min**	**Max**	**Mean**	**SD**	**Min**	**Max**
New rider	33.34	10.46	16	71	33.48	10.84	16	74
Long-term rider	47.05	11.06	21	85	46.99	12.51	28	77
Returning rider	48.71	8.63	25	84	44.62	8.65	29	68

3.4.4 Motorcycle ownership

Just under half of both groups (46% long-term riders, 42% returning riders) ride machines with an engine capacity of 751cc or more (Figure 31). Sports/touring bikes were the most popular motorcycles across all rider types. New riders were, however, more likely to own mopeds and scooters than any other rider type and, given our previous results, differences here are likely to be a reflection of the way in which each group utilises their machine.

Figure 31: Engine capacity by rider and trip type
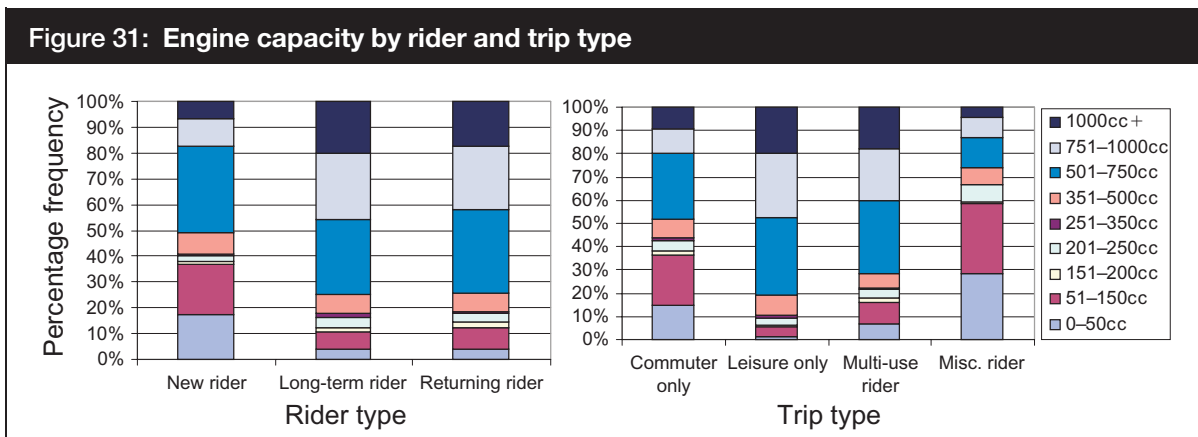
When we examine motorcycle engine capacity by trip type we can see that it is the leisure rider that tends to own the larger capacity machines and the commuter rider who tends to rely on the lower capacity machines.

3.4.5 Risk and accidents

Riders were asked to rate how likely it was that they would be involved in an accident compared to four other groups of road users. Figure 32 shows that riders tended to believe that they were at less risk than all other road user groups except car drivers (whereas motorcyclists are, in fact, at more risk). The results are in line with those of Rutter *et al*. (1998) who suggested that riders display 'comparative optimism' concerning the likelihood of being involved in an accident. Comparisons of risk measures suggested that long-term and returning riders showed the greatest signs of unrealistic optimism. Put more simply, when comparing themselves with other road user groups, riders tended to perceive themselves as at less risk on the road.

Figure 32: **Mean comparative risk scores by rider type**
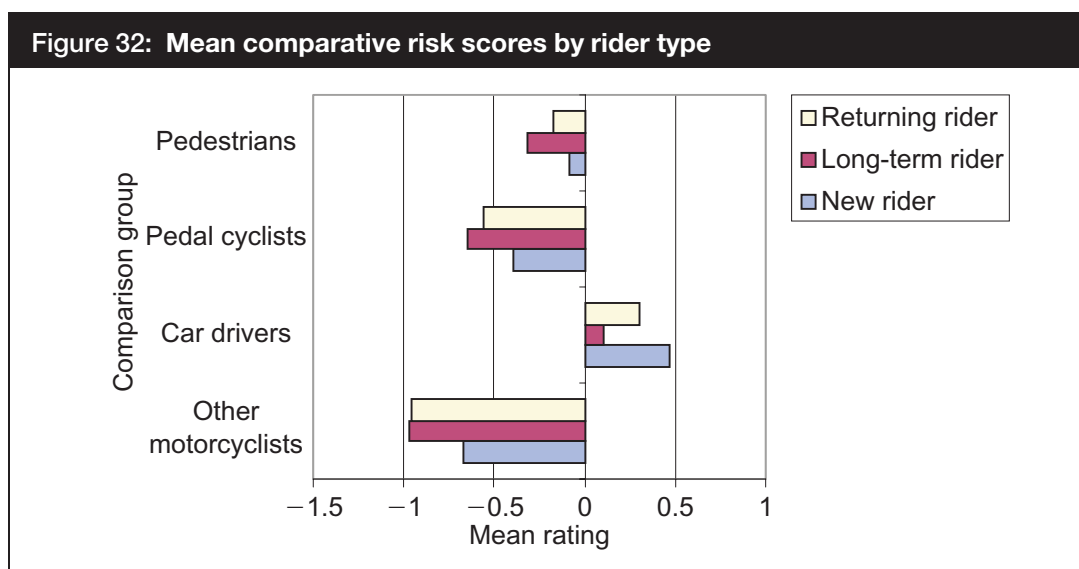
Comparisons with the absolute risk of being involved in a fatal accident or being seriously injured also suggested that riders were over optimistic in their risk perceptions (Table 24). Each group, on average, rated themselves as at less risk than the average motorcyclist.

Table 24: **Mean (SD) absolute fatal and serious injury risk scores**

Rider type	Fatal accident	Serious injury
New rider	−0.73 (1.54)	−1.76 (1.65)
Long-term rider	−1.01 (1.43)	−2.09 (1.49)
Returning rider	−1.08 (1.37)	−2.14 (1.43)

Given that the long-term and the returning rider showed the greatest signs of unrealistic optimism, it follows that campaigns should specifically target these groups, emphasising that motorcyclists are still at risk despite having accrued considerable experience and having developed reliable handling skills. Despite having a more realistic perception of the risks involved in motorcycling, new riders tended to be involved in more accidents than any other rider type (Table 25).

Table 25: Distribution of accidents within the rider type groups (%)			
No. of accidents in last 12 months	New rider	Long-term rider	Returning rider
None	74.15%	90.72%	88.78%
One	19.48%	7.82%	9.83%
Two	4.85%	1.13%	1.21%
Three	1.26%	0.24%	0.19%
More than three	0.27%	0.08%	0.00%
Total	*100%*	*100%*	*100%*

3.4.6 Intention to engage in risky riding behaviours

In the following section the power of the TPB to predict intentions to engage in each of the seven scenarios is reported in sequence. Table 26 shows the proportion of motorcyclists who intended to engage in each of the risky riding behaviours.

Table 26: Proportion of riders intending to engage in the behaviours		
Behaviour	n	Intenders
Speeding on a motorway	1886	43%
Close following car in front	1910	4%
'Going for it' on a rural road	1577	30%
Poor awareness in busy traffic	1570	1%
Fast cornering	1231	20%
Riding whilst over the legal alcohol limit	1220	4%
Riding fast to keep up with a group	2686	14%

First, correlation analyses were performed on the data to discover the relationships between the variables. Then a regression analyses allowed us to examine which variables could predict intention to engage in the risky behaviours. Finally, for each of the behaviours, the data set was split between intenders and non-intenders. Intenders were defined as those riders who tended to agree that they would intend, plan and want to engage in the behaviour (i.e. a mean behavioural intention score above the neutral point zero). Non-intenders were riders whose mean behavioural intention score fell on or below the neutral point zero (i.e. they did not intend, plan nor want to engage in the behaviour).

3.4.6.1 Speeding behaviours

The results from the three speeding scenarios were very similar and will thus be summarised together. For all three speeding scenarios, significant correlations suggested that those who were more likely to intend to speed were:

- younger;
- male;
- rode larger machines;
- had less experience; and
- were higher sensation seekers.

When regression modelling was carried out to discover the key predictors, it was found that those intending to speed:

- had engaged in frequent speeding in the past;
- tended to perceive control factors as facilitating rather than inhibiting speeding;
- possessed a positive attitude toward speeding;
- did not perceive pressure from important others not to speed;
- were younger; and
- tended not to possess a self-identity as a safe rider.

When the individual components of the TPB were analysed, it was found that intenders could be differentiated in a number of ways (Figure 33). They associated positive feelings with speeding, including exhilaration and the ability to beat the surrounding traffic. In contrast to non-intenders, they did not associate speeding with feelings of anxiety or an increase in the risk of being involved in an accident.

Figure 33: Behavioural beliefs towards exceeding the speed limit
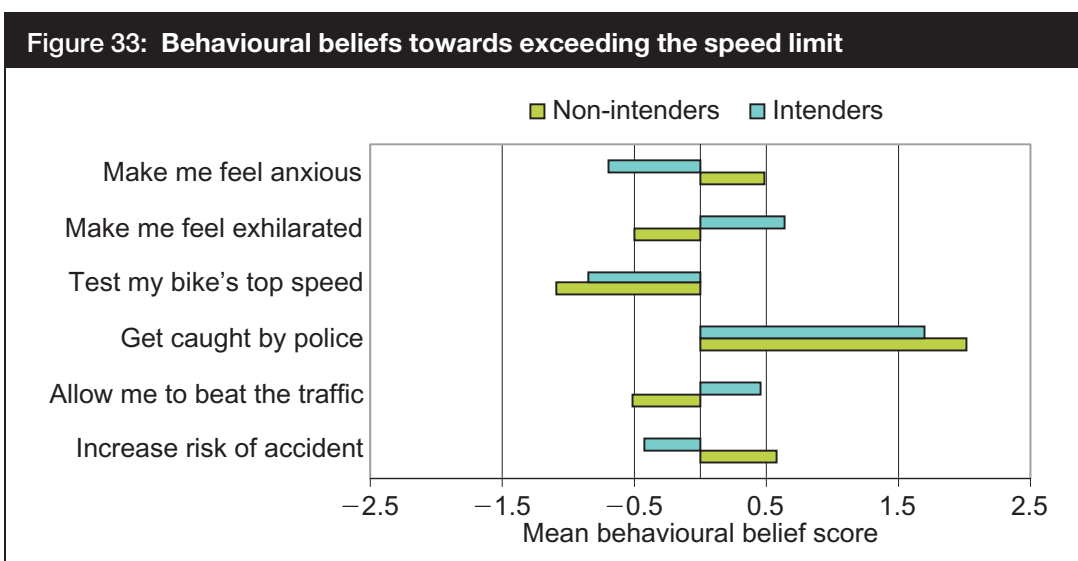
Both groups believed that speeding would result in them being caught by the police, and that it was not an appropriate test of their motorcycles' top speed. Those who intended to exceed the speed limit believed that, whilst the police would disapprove of this behaviour, other riders and their family would not disapprove. In any case, intenders' motivation to comply with these significant others was weak. When considering the external influences on behaviour, those who intended to exceed the speed limit were more likely to do so when these external influences were facilitating (i.e. on dry days, good roads and light traffic).

3.4.6.2 Close following

The results of the regression modelling indicated that those riders who intended to maintain a safe distance from the vehicle:

- had frequently maintained a safe distance in the past;

- believed more positive outcomes would result from maintaining a safe distance;

- held positive attitudes towards maintaining a safe distance;

- anticipated regretting not maintaining a safe distance;

- tended to perceive factors as facilitating rather than inhibiting maintaining a safe distance; and

- perceived not maintaining a safe distance to be a risky behaviour.

Those riders who did not intend maintaining a safe distance felt that doing so would lead to feelings of frustration and felt that maintaining a safe distance would not allow them to keep up with the traffic (Figure 34). Intenders, on the other hand, expressed stronger beliefs that maintaining a safe distance would make them feel safe, give them longer to brake, and reduce their risk of hitting the vehicle in front.

Figure 34: **Behavioural beliefs towards maintaining a safe distance**
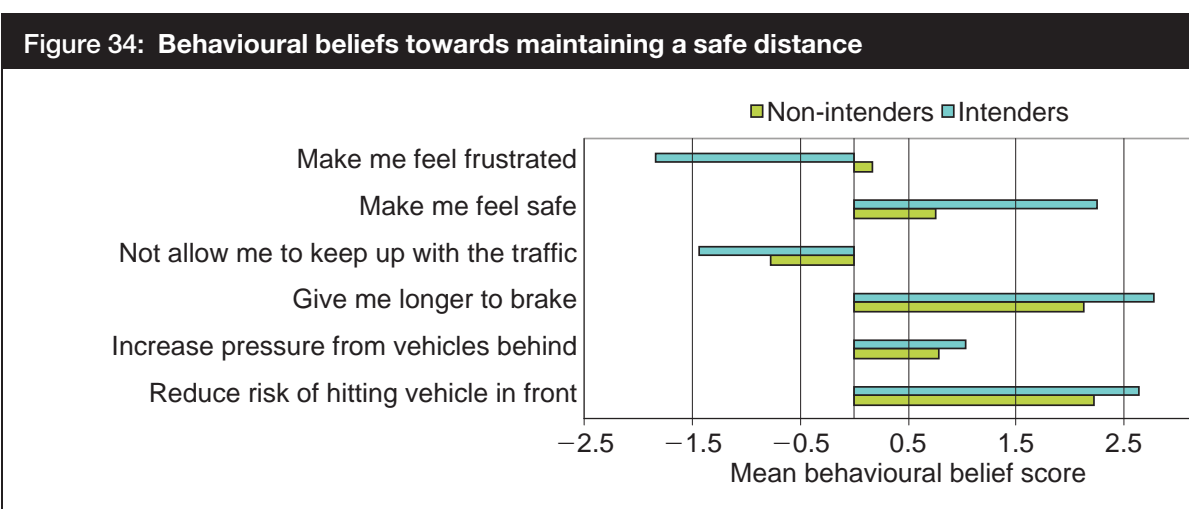
Those who intended to maintain a safe distance believed that other riders would approve of this behaviour, and also had a stronger belief that their family would also approve of this. The non-intenders expressed a weaker motivation to comply with all the significant reference groups.

With regard to the external influences on behaviour, the close followers were significantly more likely to ride when they were in a rush and stated that their behaviour would be affected by the speed of the vehicles in front and behind them (and by the possibility of emerging vehicles from side roads).

3.4.6.3 Awareness

Ninety-nine per cent of the riders intended to pay attention to emerging traffic, reflecting an overwhelming appreciation of the profit of vigilance on the road. If we are to encourage this behaviour and educate the minority of those riders who pay little attention to emerging traffic, it is important that we understand the key predictors of this behaviour. In order to allow more statistically robust comparisons, riders were split at the median. Intenders were defined as those falling on or above the median (1059 riders) and non-intenders were defined as those falling below the median (511 riders).

The results of the regression modelling indicated that those who intended to pay attention:

- perceived that positive outcomes would result from paying attention;

- had tended to pay attention in the past;

- possessed a positive attitude towards paying attention;

- perceived a high level of control over paying attention to emerging vehicles;

- perceived not paying attention to be a risky behaviour;

- anticipated regretting not paying attention; and

- had accrued a lower annual mileage.

Those who did not intend to pay attention cited feelings of frustration and distraction as being reasons for not doing so, whereas intenders believed this behaviour would make them feel safer and would reduce the severity of an accident (Figure 35).

Figure 35: Behavioural beliefs towards paying attention
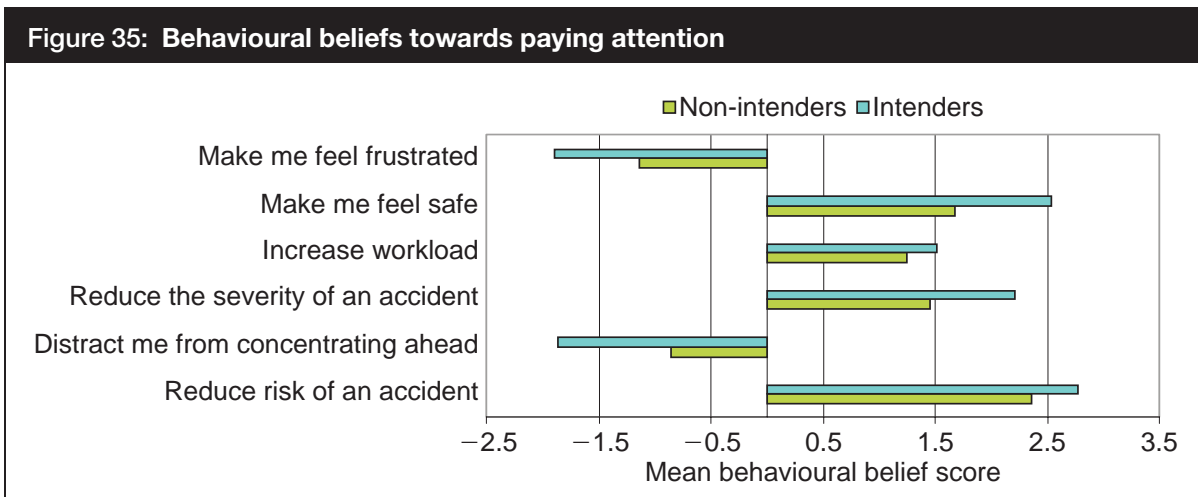
3.4.6.4 Drink-riding

Of the 1220 riders, only 49 riders were classified as intenders. In order to allow more statistically robust comparisons, riders were split at the median. Intenders were defined as those falling above the median (379 riders) and non-intenders were defined as those falling on or below the median (841 riders).

The results of the regression modelling indicated that those who intended to drink-ride:

- held positive attitudes towards drink-riding;

- were not morally opposed to drink-riding;

- felt in control of their actions;

- had frequently engaged in drink-riding;

- did not anticipate regretting drink-riding;

- had a lower annual mileage;

- did perceive risk to be involved in drink-riding; and

- did not perceive pressure from significant others not to drink-ride.

Drink-riders associated feelings of exhilaration with the behaviour and felt that doing so would get them home quicker and more conveniently than alternative methods of transport (Figure 36). Those who choose not to drink-ride do so because it would make them feel anxious and likely to be caught by the police.

Figure 36: Behavioural beliefs towards drink-riding
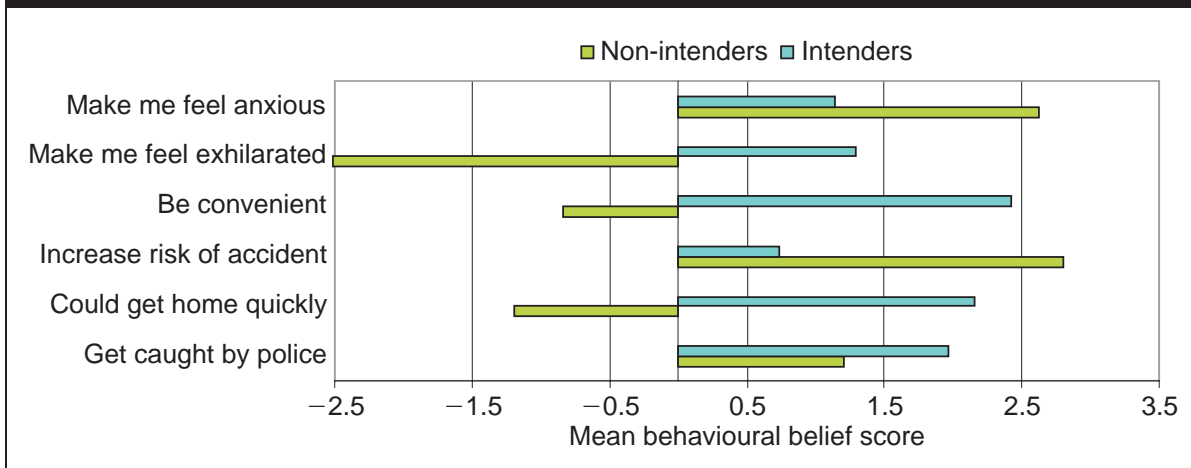
3.4.6.5 Fast cornering

The results of the regression modelling indicated that those who intended not to brake when they approached a bend:

- tended to have frequently not braked in the past;

- showed a weaker moral objection to not braking;

- believed that more positive than negative outcomes would result from not braking;

- did not perceive pressure from significant others;

- possessed positive attitudes towards not braking; and

- were male.

Those riders who intended not to brake at the bend cited exhilaration and the testing of riding skills as reasons for doing so. Those who chose to brake reported that they

Figure 37: Behavioural beliefs towards fast cornering
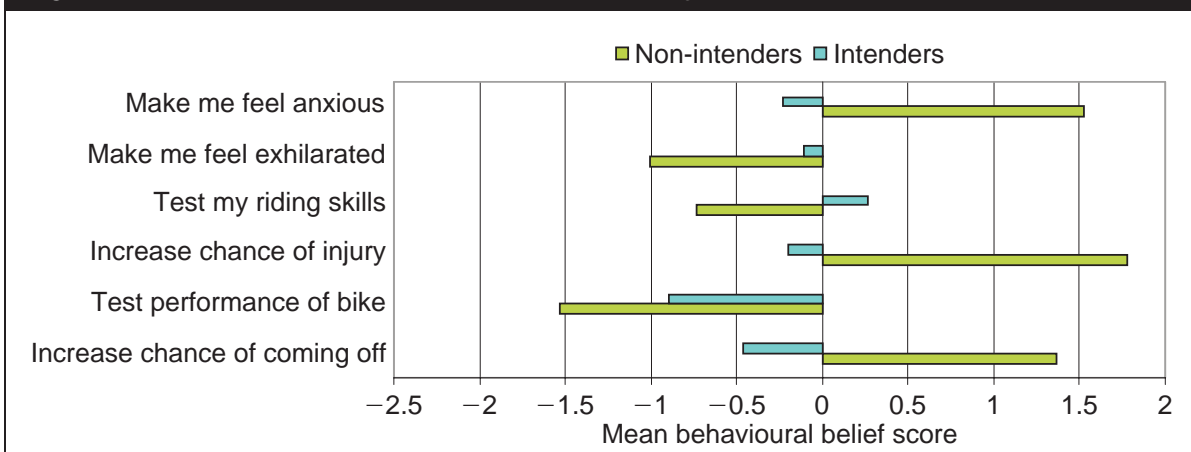
did so to prevent feelings of anxiety, and to decrease their chances of coming off and sustaining an injury.

3.4.7 Implications for speeding

Of the three scenarios that related to speeding, around 40% of riders expressed an intention to speed. The powerful influence of past behaviour presents a difficult problem, however, as such behaviours are much more resistant to change. Change could either be enforced (using road engineering or intelligent transport solutions) or encouraged within the training regime. This could be achieved most effectively within the hazard perception test and the practical test. Since most riders are car drivers too, the hazards of speeding should also be directly tackled in the car driving test.

Riders expressing strong intentions to speed regarded the control factors as facilitators of the behaviour. In order to lessen riders' intentions it would therefore seem appropriate to convince them that they are in control of their actions and that these specific situations should inhibit their propensity to speed. Those intending to speed believed that this would be facilitated by good road and weather conditions, and given our previous evidence that the nature of motorcycling is changing to that of a leisure activity enjoyed throughout the summer months, targeted campaigns would be best suited to the dry summer months when motorcycling and the propensity to speed is at its peak. A high police presence was rated by both groups as inhibiting their propensity to exceed the speed limit. Steps should be taken to ensure police presence is directly or indirectly felt, particularly near popular motorcycling routes. Although direct policing may not always be appropriate, indirect measures such as speed cameras, police warning signs and information leaflets endorsed by the police might prove beneficial additions to any targeted campaign.

Attitudes were also a powerful determinant of intention to speed. Changing road users' attitudes is a common focus of safety campaigns. Our research would suggest that it is important to challenge riders' positive beliefs surrounding speeding and to attempt to instil a negative attitude, emphasising that speeding is an unsafe, useless, unsatisfying, harmful, negative, reckless violation that should not evoke any enjoyment. In order to promote behavioural beliefs that are in line with those upheld by non-intenders, the results suggest that campaigns should focus on highlighting the direct link between speed and accidents, the increased chance of being caught by the police, and emphasise the potential negative emotive reactions to succumbing to speeding (i.e. feelings of anxiety). Similarly, care should be taken to express the negative consequences of these situations; the threat to riders' and other road users' lives, the financial cost of being caught for speeding and the inconvenience of loosing their licence. As intenders were significantly more likely to believe that speeding would allow them to beat the traffic and would cause feelings of exhilaration, it follows that campaigns might down play the thrills and benefits

gained from speeding and counteract these by emphasising the potential negative consequences (see Stead *et al.*, 2002, for examples of how to operationalise the TPB components within a media campaign).

Given that those riders expressing stronger intentions to exceed the speed limit perceived little normative pressure not to engage in this behaviour, it would seem appropriate to raise riders' awareness of the impact of speeding on their significant others. It is important that riders begin to believe that their significant others (i.e. the police, other road users, their family, other riders) would disapprove of them exceeding the speed limit and that it is important to consider their beliefs when they are on the road. In view of the fact that the family were the most influential referents on intenders and that intenders believed they were unlikely to disapprove of speeding, campaigns should promote the importance of family, their disapproval of speeding and the potential impact of speeding on their lives. Since the police were the most influential referent group for non-intenders, the idea that direct and indirect policing should be increased is confirmed.

As it was found that younger riders are those most likely to intend to exceed the speed limit, any successful campaign must set its tone at this age group, actively publicising the campaign in places and at times where this age are most likely to pay attention. Rider training would seem a particularly appropriate place to step up campaigns against speeding, as we have shown that new riders are, on average, younger than those who have been riding for a considerable length of time.

The influence of a strong sense of self-identity suggests that riders who perceive themselves as safe motorcyclists express weaker intentions to engage in speeding. It becomes important, therefore, to address those riders who do not regard themselves as safe motorcyclists, emphasising that it would benefit themselves, their family and would improve their societal role if they did begin to act, and regard themselves as, safe and responsible riders. Encouraging the formation of such a self-identity is clearly a complex process. Nevertheless, campaigns which attempted to emphasise the positive aspects of this identity (e.g. thoughtful of others, calm) and counter the negative aspects (e.g. carefree, living for today) might increase this self-identity.

3.4.8 Implications for close following

Ninety-six per cent of the riders intended to maintain a safe distance from the vehicle in front, suggesting that training and experience are adequate. For the minority of non-intenders, past behaviour was again the strongest predictor of intentions. Intenders believed that positive outcomes would arise from such behaviour (e.g. less chance of an accident), thus safety campaigns should challenge negative behavioural beliefs. As non-intenders were less likely to believe that maintaining a safe distance would give them longer to brake and would reduce the risk of them hitting the vehicle in front, these actual benefits should be made real to

the rider. As with driver campaigns, adverts might visually demonstrate the effect of longer braking distances versus shorter braking distances.

Those who intended to ride closely believed that a slow driver in front and a pressing driver behind would make it difficult for them to maintain a safe distance. It should be impressed that riding closely to another vehicle will not get them to their destination any faster and that it is their, not others, decision to ride at a certain following distance. Similarly, as non-intenders also reported that being in a rush would make them less likely to adopt safer following distances, they should be reassured that the safety benefits of maintaining a safe distance for themselves, other road users and their family far outweigh the benefit of arriving at their destination in a shorter period of time.

Although normative pressure was not directly predictive of riders' intentions to maintain a safe distance from the vehicle in front, those who intended not to thought that other motorcyclists were unlikely to approve of them maintaining a safe distance. They should be made to realise that they are the minority amongst the motorcycling population and that as they were also less likely to believe that their family would approve, campaigns should again highlight that a rider's family has their safety interest at heart.

3.4.9 Implications for awareness

Here, behavioural beliefs were the strongest predictors of intention. The results suggest that non-intenders should understand that paying attention will lead to a stronger feeling of being safe on the roads, will not distract them from the road ahead, will reduce the severity of an accident, will not make them feel frustrated and will reduce the risk of an accident. Past behaviour was again a strong predictor of intentions.

Although normative pressure did not provide a significant predictor of intentions, comparisons across intenders and non-intenders suggest that riders agreed the referents would approve of this behaviour but that intenders are significantly more motivated to comply with these referents. Since the family were the most influential referents for both groups, it follows that campaigns should promote the importance of family and their approval of riders engaging in pro-safety behaviour. Similarly, campaigns might highlight how riders' safety behaviour impacts upon other road users, the police and other motorcyclists.

3.4.10 Implications for drink-riding

Attitude was the strongest determinant of riders' intentions. Those riders who held positive attitudes towards riding, even though they suspected they may be over the legal limit, expressed significantly stronger intentions. It is important to challenge riders' positive beliefs surrounding drinking and riding, and to attempt to instil a

negative attitude, emphasising that this behaviour is an unsafe, useless, unsatisfying, harmful, negative, reckless violation that will not evoke any enjoyment. In order to promote behavioural beliefs that are in line with those upheld by non-intenders, the results suggest that campaigns should focus on dissuading intenders that drinking and riding is an easy and convenient option. Intenders were more likely to believe that riding, even though they suspect they may be over the legal limit, would be more convenient and, get them home more quickly. Riders should be made aware that the potential consequences of riding, even though they suspect they may over the legal limit, far out weigh the short-lived benefits. Similarly, it should be emphasised that engaging in this behaviour would evoke feelings of anxiety and not feelings of exhilaration, and would increase the risk of an accident and being caught by the police.

Moral norms were also a significant predictor, such that those riders who did not perceive riding when over the legal limit as morally wrong expressed significantly stronger intentions. It is therefore necessary to impress the social unacceptability of drink-riding in today's society, emphasising that this behaviour does not only put the rider at risk but that his/her behaviour has serious potential consequences for other members of society (i.e. road traffic accident victims, victim's family, financial cost of road traffic accidents) which will not be tolerated. Thankfully, only a small minority of our sample intended to engage in the behaviour.

When riders did not anticipate regretting riding, even though they suspect they may be over the legal limit, intentions to engage in this behaviour were significantly stronger. Riders should be reminded that their actions have serious consequences for themselves, their family and other road users, and that engaging in this behaviour can only lead to uneasy feelings of guilt. They should be reminded that their behaviour does not only impact upon themselves but many others.

Those riders who perceived the stated control factors as facilitators rather than inhibitors of the behaviour intended to ride even though they suspected they may be over the legal limit. Although both intenders and non-intenders believed that little traffic, drinking a short distance from home and drinking an easy ride from home inhibited the behaviour, intenders were significantly weaker in their evaluation. It follows, therefore, that campaigns should highlight that accidents can occur even on the shortest, simplest trips and no matter how quiet the traffic may be there is always a potential conflict when an individual is riding under the influence of alcohol. Both also agreed that a police presence and other onlookers would inhibit their propensity to ride even though they suspect they may be over the legal limit. Steps could be taken to increase direct or indirect policing in popular drinking locations. Police-endorsed information leaflets could be placed near entrances to remind riders of the implications of their actions.

Normative pressure significantly predicted intentions, such that those riders perceiving little pressure not to ride even though they suspect they may be over the

legal limit expressed significantly stronger intentions to engage in the behaviour. Although intenders agreed that all the referent groups would disapprove of this behaviour, intenders were weaker in this belief and were less motivated to comply with these groups. Given that the family were the most influential referent group for non-intenders and the police the most influential group for intenders, campaigns should promote their disapproval of drink-riding and the far reaching impact this behaviour could potentially have on their and other's lives. As before, campaigns would benefit from emphasising the disapproval of these groups and increasing the direct or indirect presence of the police, highlighting their power to impose fines and endorsement points.

3.4.11 Implications for fast cornering

Twenty per cent of riders intended not to brake as they approached a bend. The implications of these results are somewhat mixed. Riders suggested that it is more likely they would change down gears rather than brake so the results must be treated with caution.

Past behaviour was the strongest predictor of intentions, such that those riders who had chosen not to brake in the past expressed significantly stronger intentions not to brake in the future. Comparisons of non-intenders' and intenders' behavioural beliefs suggested that campaigns should persuade riders that not braking would increase the risk of them suffering an injury, being involved in an accident and would lead to feelings of anxiety. Similarly, it should be emphasised that engaging in this behaviour on public roads is not an acceptable place to test their riding skills and the performance of their motorcycle. Indeed, using the roads for this purpose can only have negative outcomes.

Normative pressure significantly predicted riders' intentions, such that those riders who perceived little normative pressure not to engage in this behaviour expressed significantly stronger intentions. Intenders did not believe that any of the referents would disapprove of their not braking as they approach a bend. The results would suggest, therefore, that campaigns should again emphasise significant others' disapproval and should highlight the impact of the consequences that this behaviour could have on these groups.

Those riders expressing positive attitudes towards not braking as they approached a bend expressed significantly stronger intentions. The data would suggest that it is important to challenge riders' positive beliefs and to attempt to instil a negative attitude, emphasising that not braking is an unsafe, useless, unsatisfying, harmful, negative and reckless behaviour that will not evoke any enjoyment. Discussions earlier relating to riders' specific behavioural beliefs provide more specific ways in which to modify riders' attitudes.

Intentions were significantly stronger for those riders who reported that the control factors were more likely to facilitate than inhibit the behaviour. Examination of the individual control beliefs suggested that intenders rated all of the control factors as facilitators of the behaviour. Campaigns would benefit from persuading riders that good handling skills and a reliable machine do improve riders' safety, but they do not in any way forfeit the need to engage in cautious behaviour. Indeed, whilst a smooth and even, quiet road on a fine and dry day may well make it easier to take risks, the danger involved is no less.

3.5   Conclusions

This survey examined the determinants of riders' intentions to engage in a number of risky behaviours. Regression analysis highlighted predictive psychological characteristics amenable to intervention. We found that past behaviour emerged as the most consistent, strong and significant predictor of intentions to engage in risky riding behaviour. Nevertheless, it is not immediately obvious how to intervene to change past behaviour. Rather, these findings give us some indication that these behaviours have a habitual element to them. Riders who have engaged in these behaviours in the past are also more likely to intend to do so in the future, and conversely those who have not engaged in them in the past are more likely to intend to not do so in the future.

Of the TPB variables, attitude most consistently emerged as a predictor of intentions across scenarios, being significant in all seven riding scenarios. Behavioural beliefs also emerged as significant direct predictors of intentions in five out of the seven riding scenarios. Thus, attitudes as directly tapped or indirectly tapped through behavioural beliefs emerged as important and consistent predictors of intentions. Interventions designed to change the overall evaluations of these risky riding behaviours may prove effective in reducing the incidence of these behaviours in riders. The TPB suggests that the most effective means of changing such attitudes would be to tackle directly the underlying behavioural beliefs. This issue is commented on in the next section where we also discuss the specific beliefs that might be worth targeting.

PBC emerged as a significant predictor in three out of the seven riding scenarios. In addition, control beliefs also emerged as significant direct predictors of intentions in seven out of the seven riding scenarios. Thus, control measured directly as PBC or indirectly through control beliefs also appears to be an important predictor of intention to engage in these risky riding behaviours. Bandura (1986) has outlined four ways in which perceptions of control over a behaviour can be enhanced: through personal mastery by the setting and achieving of sub-goals (e.g. riding at a safe distance); through observing other's success; through standard persuasive techniques; and through the use of relaxation techniques (e.g. to control feelings of arousal or anxiety). The TPB would particularly emphasise the tackling of underlying control beliefs. This issue is discussed further in the next section.

Normative beliefs emerged as significant direct predictors of intentions in five out of the seven riding scenarios. Thus, changing normative perceptions might be a useful way to alter intentions to engage in these risky riding behaviours.

Of our additional variables, there was generally more variation across scenarios in their power to predict intentions. Moral norms emerged as significant direct predictors of intentions in three out of the seven riding scenarios. Anticipated regret emerged as significant direct predictors of intentions in five out of the seven riding scenarios. Self-identity emerged as a significant direct predictor of intentions in three out of the seven riding scenarios, whereas our various risk perception measures only emerged in one out of the seven riding scenarios. Thus, instilling feelings of regret about engaging in risky riding behaviours would appear to represent the most consistent means of changing intentions to engage in these actions. Fortunately regret is also one of the variables most open to simple intervention and has been tackled successfully in campaigns to increase condom use in response to the threat from HIV+/AIDS. Simple questions designed to make riders think about how they might feel may be enough to instil these feelings of regret and may be sufficient to change intentions and behaviour.

The present research did not specifically address the extent to which risky riding behaviours cluster (i.e. whether particular individuals tend to engage in a number of different risky riding behaviours). However, our data did enable us to examine the relationship between intentions to engage in various different riding behaviours. In particular, we were able to examine the extent to which those reporting they were intending to engage in one risky riding behaviour also reported an intention to engage in certain other risky riding behaviours (i.e. the correlation between intentions to engage in different riding behaviours). These data are reported in Table 27. However, as this had never been the focus of the study, the design did not allow us to examine the correlation between all studied risky riding behaviours (i.e. respondents only responded to three risky riding behaviours and only one of three different combinations were presented: speeding, close following and group riding; going for it, awareness and group riding; and cornering, drink-riding and group riding). Thus it is unfortunate, but we cannot compute the relationships between a number of these risky riding behaviours.

Table 27 indicates significant correlations between all pairs of risky riding behaviours that we were able to compare. Nevertheless, the size of these relationships is generally modest, with the largest relationship (between group riding and going for it r = 0.42) indicating a mere 17% shared variance between the two behaviours. Thus, for all intents and purposes we can regard the present data as indicating that the risky riding behaviours were independent of one another. In only three cases did these relationships indicate even a moderate relationship (>10% shared variance or r > 0.32). These were for group riding and close following, group riding and going for it, and for group riding and drink-riding. But even in these cases, the degree of overlap was no higher than moderate (< 17% shared

variance). This would suggest that interventions that targeted one risky riding behaviour (through changing underlying beliefs) would only have modest impacts on other risky riding behaviours. It would therefore suggest the need for interventions to specifically target a particular behaviour.

Table 27: Correlations between intentions to engage in various risky behaviours							
	1.	**2.**	**3.**	**4.**	**5.**	**6.**	**7.**
1. Group riding	–	−0.33* n = 1079	0.24* n = 1075	0.42* n = 850	−0.18* n = 848	0.24* n = 675	0.34* n = 669
2. Not close following		–	−0.20* n = 1884	n/a	n/a	n/a	n/a
3. Speeding			–	n/a	n/a	n/a	n/a
4. Going for it				–	0.09* n = 1561	n/a	n/a
5. Awareness					–	n/a	n/a
6. Cornering at speed						–	0.12* n = 1214
7. Drink-riding							–
Note: * denotes significance at 0.05 level.							

The present analysis is also consistent with the view of models such as the TPB, which suggest that the determinants (i.e. beliefs) of a behaviour are specific to that behaviour. So, for example, a belief that speeding is likely to lead to an accident is not necessarily related to a belief that close following will lead to an accident. This also points to the need to specifically target behaviours for change rather than generic interventions which attempt to produce change in multiple behaviours.

4 ACCIDENT LOCATIONS – DISTANCE FROM HOME

One of the aims of the Older Motorcyclist project was to examine whether there are differences in accident involvement and causation depending on the age of the motorcyclist. One way of achieving this is to interrogate the STATS19 data—the standard accident data collection carried out by the police. Although this database contains information concerning the accident and the casualties and vehicles involved, the information is limited due to constraints on police time and resources. In-depth accident studies provide the necessary information in order to analyse effectively the various components of accident causation.

The 2000 STATS19 database was used to glean an overview of the nature of accident involvement using age as the identifying characteristic. In addition, using the postcode data, it was possible to calculate the distance between the crash site and the driver's home address. This provides a coarse overview of how 'local' accidents are, i.e. how far riders are from home when the accident occurs. One of the disadvantages of STATS19 data is that the recording of engine capacity is very gross. There are only three categories of powered two-wheelers (PTW) available: mopeds, motorcycles under 125cc and motorcycles over 125cc.

4.1 STATS19 database

This database, supplied by the DfT, contains details of injury accidents reported to the police for the year 2000. The data are supplied as three separate files, providing details of the:

- accident (circumstance), with one file record per recorded accident;

- vehicles (involved), with one file record per vehicle/driver involved; and

- injured (persons), with one file record per injured person.

The data in these files are linked using a common accident reference number.

4.2 Methodology

The first part of the analysis involved basic querying of the data to extract demographic information of the accident-involved riders. Secondly, the postcode data was extracted. In order to calculate the distance between accident location and the driver's home address, the spatial co-ordinates of the driver's home address postcode were matched onto the driver records in the vehicles file. Then, a calculation was made of the straight line distance from the home address co-ordinates to the accident location co-ordinates.

4.3   Demographics

Unsurprisingly, the majority of accident-involved riders were male (Table 28). However, whilst females' accident involvement was evenly split over the three categories (approximately 30% in each), male accident involvement was skewed towards those motorcycles over 125cc (61%).

Table 28: Accident involvement by rider gender (% of total sample)			
PTW type	**Male (n)**	**Female (n)**	**Missing**
Moped	3493 (12%)	804 (3%)	59 (0)
Motorcycles <125cc	6820 (23%)	711 (3%)	122 (0)
Motorcycles >125cc	16,293 (56%)	758 (3%)	176 (0)
Total	*26,606 (91%)*	*2273 (8%)*	*357 (1%)*

The majority of accident-involved riders are in the 11–20 year bracket (see Jamson, 2003). However, proportionally, a rider is most likely to be accident-involved if they are riding a motorcycle over 125cc and are in the 21–40 age bracket, or in the younger age-group riding a low powered PTW (Table 29).

Table 29: Accident involvement by rider age (% of total sample)									
PTW type	**Age (years)**								
	0–10	**11–20**	**21–30**	**31–40**	**41–50**	**51–60**	**61–70**	**71–80**	**81–90**
Moped	0.1%	10.3%	2.1%	1.1%	0.6%	0.4%	0.2%	0.1%	0%
Motorcycles <125cc	0.2%	14.0%	6.1%	3.2%	1.4%	0.7%	0.3%	0.1%	0%
Motorcycles >125cc	0.1%	8.1%	24.0%	17.8%	6.6%	2.0%	0.3%	0.1%	0%
Total	*0.4%*	*32.4%*	*32.2%*	*22.1%*	*8.6%*	*3.1%*	*0.8%*	*0.3%*	*0%*

4.4   Accident severity

Whilst for each vehicle type the majority of accidents reported are slight, overall those riding machines over 125cc are more likely to be involved in fatal and serious accidents. It can be seen in Table 30 that fatal accidents peak in the age bracket 21–40 (for all types of machines).

Table 30: Accident involvement by rider age and severity (%)									
PTW type	**Age (years)**								
	0–10	**11–20**	**21–30**	**31–40**	**41–50**	**51–60**	**61–70**	**71–80**	**81–90**
Fatal Moped		0.0%	0.0%		0.0%		0.0%	0.0%	
Motorcycles <125cc		0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Motorcycles >125cc	0.0%	0.3%	0.9%	0.7%	0.2%	0.0%	0.0%	0.0%	
Serious Moped	0.0%	1.6%	3%	2%	1%	1%	0%	0%	
Motorcycles <125cc	0.1%	2.9%	1.3%	6%	3%	2%	1%	0%	0%
Motorcycles >125cc	0.0%	2.3%	6.5%	5.0%	2.1%	6%	1%	0%	
Slight Moped	0.1%	8.7%	1.8%	0.9%	0.5%	0.4%	0.2%	0.1%	
Motorcycles <125cc	0.1%	10.9%	4.8%	2.5%	1.1%	0.5%	0.2%	0.1%	0.0%
Motorcycles >125cc	0.0%	5.5%	16.6%	12.2%	4.3%	1.4%	0.2%	0.1%	0.0%

4.5 Accident location

A comparison was made between the age groups regarding the accident location (based on the speed limit of the road). For all vehicle types, most accidents are reported to be in urban areas (30mph speed limit). There is, however, a slight increase in reported accidents in higher speed limit areas for those machines over 125cc.

4.6 Postcode data

An analysis was then undertaken to discover both where the accidents were occurring (road type) and also how far this location was from the rider's recorded home address. This latter issue of the proximity of accident sites from home has been raised in a number of forums, particularly by representatives of police forces whose areas have a large rural content. Some of these forces, e.g. Devon and Cornwall, Lancashire and North Yorkshire, have suggested that riders target their counties in order to experience 'good riding routes' – which are being increasingly featured in bike magazines and Internet sites. These police forces suggest that it is these non-local riders that are increasing their accident statistics.

The analyses show that for all motorcycle categories, most accidents occur in urban areas (30mph speed limit). When analysed by accident severity, the highest proportion of fatal accidents occur in 60mph speed limit zones, presumably as a direct consequence of the speed at which they are travelling. A smaller proportion of fatal accidents occurred on motorways however, a result of the combination of higher design standards and possibly the number of miles travelled on these roads.

A simple analysis of the distance the rider was from home when the accident occurred found, unsurprisingly, that the larger the machine the further away the rider

was from home. Riders in the older age brackets (41–60) were more likely to be further from home if involved in a fatal accident. The less severe the accident, the closer to home they were. An analysis over time is necessary to see if this trend has changed, however the collection of postcode data is still in its infancy.

The recording of driver postcodes in the STATS19 database began in January 1999. However, even now, this is not a widespread practice – for the 2000 data, of the 429,945 vehicle records, complete postcode records were only available for just over half the records. The remaining data was either missing or incomplete (or erroneous) (see Table 31).

Table 31: Comparison of vehicle type and driver postcode matches		
Vehicle type	**Unmatched (%)**	**Matched (%)**
Pedal cycle	52.8%	47.2%
Moped	46.1%	53.9%
Motorcycle <125cc	48.5%	51.5%
Motorcycle >125cc	47.0%	53.0%
Taxi	45.2%	54.8%
Car	47.1%	52.9%
Minibus (8–16 passenger seats)	47.5%	52.5%
Bus or coach (17 or more passenger seats)	48.5%	51.5%
Other motor vehicle	63.8%	36.2%
Other non-motor vehicle	70.4%	29.6%
Ridden horse	57.6%	42.4%
Agricultural vehicle (includes diggers etc.)	46.1%	53.9%
Tram	51.7%	48.3%
Goods 3.5t mgw and under	51.3%	48.7%
Goods over 3.5t and under 7.5t	52.3%	47.7%
Goods 7.5t mgw and over	55.1%	44.9%
Total	*48.0%*	*52.0%*

It can be seen from Table 32 that, on average, the larger the machine the further from home the accident occurred.

Table 32: Distance from home when accident occurred (km)			
Vehicle type	**Mean**	**Max**	**Min**
Moped	5.44	364.27	0.02
Motorcycles <125cc	8.01	750.91	0.01
Motorcycles >125cc	20.43	1058.86	0.07

Riders in the older age brackets (41–60) are more likely to be further from home when involved in a fatal accident (on machines over 125cc). The less severe the accident, the closer to home they occur (see Table 33).

Table 33:	Distance from home (km) by age and accident severity								
	PTW type	**Age (years)**							
		0–10	**11–20**	**21–30**	**31–40**	**41–50**	**51–60**	**61–70**	**71–80**	**81–90**
Fatal	Moped		4.84	12.57		56.26		25.16		
	Motorcycles <125cc		3.52	4.23	45.90	1.41	1.04	60.72	4.44	
	Motorcycles >125cc	1.42	19.81	23.02	27.94	33.90	40.74	3.04		
Serious	Moped	0.61	6.37	6.07	11.69	3.35	2.95	4.41	2.56	
	Motorcycles <125cc	1.92	7.24	10.51	11.26	7.43	8.13	3.84	2.63	
	Motorcycles >125cc	5.37	17.61	21.53	26.81	35.61	26.11	18.56	2.53	
Slight	Moped	1.03	5.21	5.25	6.40	3.81	5.82	1.40	1.55	
	Motorcycles <125cc	32.6	6.27	9.32	10.53	10.24	4.44	12.20	1.77	0.54
	Motorcycles >125cc	1.74	12.46	19.24	19.96	20.04	18.23	28.33	6.53	

With regard to the data provided by the police forces, it is difficult to make comparisons due to the variable nature of the data provided. Whilst some police forces report a peak of fatal accidents in the summer months, this is not consistent. It was found, however, that a large majority of fatal accidents involve motorcycles over 500cc.

5   CONCLUSIONS

The results from the individual project reports provide quite distinct sets of findings and implications. However, the key information gathered across the analyses allows some general conclusions to be drawn regarding how best to target future campaigns.

5.1   Who to target?

Amalgamating the results from the surveys identified demographic and psychological characteristics common to those riders who are potentially at greater risk of an accident.

Given that the UK motorcycling population is overwhelmingly **male**, any intervention or successful campaign strategy must set its tone for this group. Our initial survey reported that males are statistically more likely to ride the larger motorcycles and STATS19 data suggest that the majority of accident-involved riders are males riding machines over 125cc.

Regression analysis of intentions to engage in risky riding behaviour suggested that **younger** riders are more to likely to intend to engage in speed-related behaviours. Age was a significant predictor of riders' intentions to exceed the speed limit on a motorway, 'really go for it' and ride faster than felt safe. Campaigns specifically aiming to reduce inappropriate speed could therefore be designed with this younger age-group in mind and could be actively publicised in places and at times where this sub-group are most likely to pay attention.

However, anecdotal evidence suggests that those motorcyclists riding the larger capacity machines tended to be involved in a higher proportion of accidents and our data would suggest that the types of riders owning these large capacity machines differ considerably from the younger rider. Regression analysis suggested that **leisure riders** tended to own these larger capacity machines. As this rider group comprises mainly long-term or returning riders, campaigns would benefit from targeting this older generation of motorcyclist.

The sub-group of **returning riders** should not be ignored; whilst they may be returning to the activity as an opportunity for engaging in risky behaviour, changes in testing procedures could require them to be re-trained or assessed. This has implications for introducing an 'expiry date' on a motorcycle licence if motorcycle ownership ceases for a certain period of time.

It should not be ignored that a large proportion of road crashes involving motorcyclists also involve **car drivers**. Motorcycling has increased in popularity over the last decade and car drivers do not perhaps have the requisite skills for

interacting with motorcyclists on a frequent basis. If the current trend for motorcycling is to continue, then steps should be taken to ensure that all road users are aware of the needs and possible actions of motorcyclists, e.g. checking blind-spots.

5.2 How to target?

With regard to interventions, an important analysis was that distinguishing between the beliefs of those who intend to engage in risky riding behaviours and those who do not. These provide targets for interventions which aim to change intentions and thereby behaviour in the case of these risky riding behaviours.

A detailed examination of the key beliefs for each scenario was provided in earlier sections; here a brief overview of common findings across scenarios is reported.

For behavioural beliefs, it is interesting to note that the vast majority of beliefs and evaluations assessed significantly distinguished intenders from non-intenders. This would suggest that we were generally successful in identifying the key outcomes that these beliefs focus on. It would also suggest that the vast majority of these beliefs could legitimately form the focus of interventions. The significant differences reported for each scenario suggest the way in which these beliefs would need to be changed in order to try to influence intentions and behaviour. Given the power of attitudes and behavioural beliefs to predict intentions in our analyses, tackling these beliefs should offer the best opportunity to change intentions and behaviour in relation to these risky riding behaviours.

A similar pattern also emerged for normative beliefs. Across scenarios, all four referent groups (police, other road users, family and other bikers) emerged as groups that were perceived differently by intenders and non-intenders. Those not intending to engage in risky riding behaviours tended to perceive more pressure from each of these groups not to engage in these behaviours compared to intenders. Similarly, those not intending to engage in risky riding behaviours tended to want to comply with the wishes of these groups compared to intenders. The significant differences reported for each scenario suggest the way in which these beliefs would need to be changed in order to try to influence intentions and behaviour.

A slightly different pattern emerged for control beliefs. Here there was more variation across beliefs in terms of how factors were perceived to facilitate or inhibit performing the behaviour by intenders and non-intenders. Where beliefs failed to discriminate between groups, these beliefs do not constitute a good focus of intervention. The significant differences reported for each scenario suggest the way in which these beliefs would need to be changed in order to try to influence intentions and behaviour. Generally speaking, we suspect that it may be easier to design interventions to change control beliefs (i.e. perceptions of the power of factors to facilitate or inhibit action) than frequency perceptions (i.e. perceptions of

the frequency with which these factors occur). This is despite the fact that there were more differences in perceptions of frequency than control beliefs. Given the power of perceived behavioural control (PBC) and control beliefs to predict intentions in our analyses, tackling these beliefs should offer another good opportunity to change intentions and behaviour in relation to these behaviours.

Fishbein and Ajzen (1975) provide a framework for understanding the way in which models like the Theory of Planned Behaviour (TPB) may be used to change behaviour. They emphasise the fact that beliefs are the basic determinants of any behaviour, and that any attempt to change behaviour must **target underlying beliefs**. They argue that successful behavioural change will only occur when intentions are changed through either attitudes or subjective norms. Within the TPB this may also be achieved by changing PBC. The causal model dictates that following (for example) behavioural belief change, attitudes will change and will influence behavioural intentions, which will ultimately change behaviour.

Changing behavioural beliefs involves changing individuals' beliefs about the consequences of their actions. More specifically, following a positively-valenced persuasive communication, positive outcomes should be seen as more likely to occur, and negative outcomes as less likely to occur. In addition, positive outcomes should be evaluated more positively, and negative outcomes evaluated more negatively. **So, for example, if we could increase the belief of riders who intend to speed that speeding would increase the risk of an accident and decrease their belief that speeding would lead to feelings of exhilaration, then their intentions to speed and actual speeding should decrease.** In addition, in order to produce behaviour change one might also wish to use persuasive messages to increase the value placed on being in an accident and to decrease the value placed on being exhilarated by speeding.

The normative route would change people's expectations regarding the approval or disapproval of referents, or would target their motivation to comply with such referents. So, for example, if we could **increase the belief of riders who intend to close follow that close following would be disapproved of by their family or friends then intentions and behaviour should change.** Congruent with this, PBC should increase when facilitating factors are seen as frequent and as exerting a powerful influence over behaviour, and inhibiting factors are perceived to be infrequent and to exert minimal influence over behaviour. So, for example, if we could increase the belief of riders who intend to drink-ride that drink-riding is something they have control over, then intentions and behaviour should change.

Fishbein and Ajzen (1975) explicate two strategies by which beliefs may be changed. The first involves **introducing new salient beliefs**. This approach would expose individuals to new positive salient outcomes associated with the behaviour in question, introduce them to new social referents with whom they were motivated to comply, or introduce new facilitating factors. Most typically this would be achieved

through **persuasive communications (e.g. leaflets, posters, videos)**, although more novel approaches might include **experiential or vicarious learning** where individuals gain more direct experience of the consequences of different risky riding behaviours. Whilst the efficacy of this approach remains an empirical question, the current research can make a useful contribution to such a strategy because it identifies the existing beliefs in this population. New beliefs that are thought likely to influence risky riding behaviours could then be checked for overlap against the set of modally salient beliefs generated here. Fishbein and Ajzen (1975) also highlight the fact that introducing new beliefs may influence a number of other existing beliefs by inference. However, there are also significant disadvantages associated with this approach. Most importantly, it may be difficult to generate new beliefs that were sufficiently powerful to generate behaviour change. The salient modal beliefs generated in the present research were specifically generated to be the ones individuals perceived to be the most important influence on their risky riding behaviours. Therefore, a focus on changing existing salient beliefs outlined in the second approach below may be a more fruitful route to behaviour change.

The second strategy of behaviour change focuses on **changing existing salient beliefs** of the target population. Here, Fishbein and Ajzen (1975) argue that the researcher must: (a) identify salient beliefs, (b) determine which salient beliefs are most predictive of intentions/behaviour, and (c) change the salient beliefs in the appropriate direction. The present research has achieved the first two aims in relation to various risky riding behaviours. The next stage is to design interventions to challenge negative salient beliefs or strengthen positive salient beliefs. This is usually achieved through persuasive communications (e.g. leaflets, posters, videos). For example, following Fishbein and Ajzen's (1975) approach, a persuasive communication might **stress the likelihood that speeding can make you feel anxious and be unlikely to allow you to beat the traffic**. The intervention should also target the value placed on these outcomes. For example, by placing emphasis on the value of not feeling anxious while riding and placing de-emphasis on being able to beat the traffic.

Such an approach was taken by Parker *et al.* (1996) who designed four videos targeted toward changing normative beliefs, behavioural beliefs, PBC and anticipated regret, with respect to speeding behaviour by car drivers. The normative beliefs and anticipated affect videos had a significant positive impact on attitudes and beliefs, although the PBC video actually decreased perceptions of control. This study contains a number of useful lessons about how to target salient beliefs.

Less traditional approaches to changing beliefs might use alternative approaches, focusing on experience with the different outcomes that form the focus of the identified salient beliefs. Such experience might take the form of **on road or simulator riding experiences** or may even get individuals to imagine different situations and outcomes (simulated experience). However, we are not aware of any

research testing the effectiveness of such approaches in changing beliefs and behaviour in this area.

5.3   When to target?

These data showed that all riders generally increased their usage in the summer months for commuting trips. This also held true for leisure trips, although the number of trips made by returning riders peaked more dramatically than the other groups in the months of June to August. Indeed, leisure riders reported dramatic increases in use in these **summer months**. Given the concomitant increase in accidents during the dry months, this would be, therefore, an ideal time to target any campaigns to improve driver/rider knowledge or awareness, when the proportion of fair weather, returning riders is at its highest on the road. Discouraging the use of public roads as a form of entertainment should become a focus for policy makers.

Since past behaviour was highlighted as a key predictor of intentions to engage in risky riding behaviour, it seems appropriate to ensure that good handling and safety practices are well established during a rider's initial training. In order to encourage **continual training** throughout a motorcyclist's riding career, schemes such as a free course offered at the point of sale would seem of benefit, especially given the dramatic rise in sales of larger capacity machines. This seems particularly relevant for those riders who are returning to the activity after a break, as the survey results indicate that not only do they increase the size of their motorcycle's engine with each progressive purchase but that they also do this with relative speed. Thus, the identification of these returning riders and legislative changes to ensure they undertake **compulsory refresher courses** are suggested.

5.4   Future directions

This research has identified which individuals to target in interventions (in terms of motorcycling characteristics) in order to reduce accident-related behaviours. It has also identified a number of key cognitions to target that might be expected to produce behavioural change. Future research should test whether such targeted interventions are successful in producing behavioural change which has a significant impact on accident statistics.

6 REFERENCES

Ajzen, I. (1985). From intentions to action: A theory of planned behaviour. In Kuhl, J. & Beckman, J. (eds), *Action control: From cognitions to behaviors*. New York: Springer. pp. 11–39.

Arnett, J.J. (1996). Sensation seeking, aggressiveness and adolescent reckless behaviour. *Personality and Individual Differences*, 20, pp. 693–702.

Bandura, A. (1986). Fearful expectations and avoidant actions as coeffects of perceived self-inefficacy. *American Psychologist*, 41(12), pp. 1389–1391.

Broughton, J. (1988). *The relationship between motorcycle size and accident risk*. TRRL Research Report RR169. Crowthorne: Transport and Road Research Laboratory.

Carron, A.V. (1971). Effect of ability level upon retention of a balance skill after two years. *Perceptual & Motor Skills*, 33(2), pp. 527–529.

Clarke, D., Ward, P., Truman, W. & Bartle, C. (2003). Motorcycle accidents: preliminary results of an in-depth case-study using police accident files. Paper presented at the DfT Behavioural Research in Road Safety: Thirteenth Seminar, Nottingham.

Cooper, P.J. & Rothe, J.P. (1988). Motorcyclists: who they are and why they do what they do. *Transportation Research Record 1168*, pp. 78–85.

Department for Transport (2001). *Road Accidents in Great Britain 2001: The casualty report. Transport Statistics*. London: The Stationary Office.

Department for Transport (2002). *Road Accidents in Great Britain 2002: The casualty report. Transport Statistics*. London: The Stationary Office.

Elliot, M., Baughan, C., Broughton, J., Chinn, G., Grayson, G., Knowles, J., Smith, L. & Simpson, H. (2003a). *Motorcycle safety: a scoping study*. TRL Report TRL581. Crowthorne: Transport Research Laboratory.

Elliot, M. Sexton, B. & Keating, S. (2003b). Motorcyclists' behaviour and accidents. Paper presented at the DfT Behavioural Research in Road Safety: Thirteenth Seminar, Nottingham.

Fishbein, M. & Ajzen, I. (1975). *Belief, attitude, intention, and behaviour: An introduction to theory and research*. Reading, MA: Addison-Wesley.

Forsyth, E., Maycock, G. & Sexton, B.F. (1995). *Cohort study of learner and novice drivers, Part 3: Accidents, offences and driving experience in the first three years of driving*. Department of Transport, TRL Report PR 111. Crowthorne: Transport Research Laboratory.

Haworth, N.L. & Smith, R. (1998). Estimating risk factors for motorcycle crashes. *Road Safety Research, Policing, Education Conference*, 1998. Vol 1, pp. 156−160.

Haworth, N., Mulvihill C. & Symmons, M. (2002). *Motorcycling after 30*. Accident Research Centre Report No. 192. Monash University. Australia.

Hobbs, C., Galer, I. & Stroud, P. (1986). *The characteristics and attitudes of motorcyclists: a national survey.* TRL Research Report 51. Crowthorne: Transport Research Laboratory.

Horswill, M.S. & Helman, S. (2002). A behavioural comparison between motorcyclists and a matched group of non-motorcycling car drivers: factors influencing accident risk. *Accident Analysis and Prevention*, 873, pp. 1−9.

Hurt, H., Ouellet, J. & Thom, D. (1981). *Summary of findings reprinted from Motorcycle Accident Cause Factors and Identification of Countermeasures*, Volume 1, Technical Report. Traffic Safety Centre, University of Southern California, Los Angeles.

Jamson, S.L. (2003). *Accident analysis*. Deliverable four to the DfT Contract No. 9/31/64. Leeds: University of Leeds.

Jamson, S.L. & Chorlton, K. (2001). *International review.* Deliverable one to the DfT Contract No. 9/31/64. Leeds: University of Leeds.

Jonah, B.A. (1997). Sensation seeking and risky driving: a review and synthesis of the literature. *Accident Analysis and Prevention*, 29(5), pp. 651−665.

Lawton, R., Parker, D., Manstead, A.S.R., & Stradling, S.G. (1997). The role of affect in predicting social behaviours: The case of road traffic violations. *Journal of Applied Psychology*, 27, 1258−1276.

Lynam, D., Broughton, J., Minton, R. & Tunbridge, R.J. (2001). *An analysis of police reports of fatal accidents involving motorcyclists*. TRL Research Report RR169. Crowthorne: Transport Research Laboratory.

Maycock, G., Lockwood, C.R. & Lester, J. (1991). *The accident liability of car drivers*. Department of Transport, TRL Report RR 315. Crowthorne: Transport Research Laboratory.

Mortimer, R. (1984). Evaluation of the Motorcycling Riding Course. *Accident Analysis and Prevention*, 16(1), pp. 63−71.

National Statistics Socio-economic Classification: http://www.statistics.gov.uk/methods_quality/ns_sec

Naylor, J.C., Brigg, G.E. & Reed, W.G. (1968). Task coherence, training time, and retention interval effects on skill retention. *Journal of Applied Psychology*, 52(5), pp. 386−393.

Parker, D., Manstead, A.S.R., Stradling, S.G., Reason, J.T. & Baxter, J.S. (1992a). Intention to commit driving violations: An application of the theory of planned behaviour. *Journal of Applied Psychology*, 77, pp. 94−101.

Parker, D., Manstead, A.S.R., Stradling, S.G. & Reason, J.T. (1992b). Determinants of intention to commit driving violations. *Accident Analysis and Prevention*, 24, pp. 117–131.

Parker, D., Stradling, S.G. & Manstead, A.S.R. (1996). Modifying beliefs and attitudes to exceeding the speed limit: an intervention study based on the theory of planned behaviour. *Journal of Applied Social Psychology*, 26, pp. 1–19.

Rutter, D.R., Quine, L., & Albery, I.P. (1998). Perceptions of risk in motorcyclists: Unrealistic optimism, relative realism and predictions of behaviour. *British Journal of Psychology*, 89, pp. 681–696.

Sauer, J., Hockey, G.R.J. & Wastell, D.G. (2000). Effects of training on short- and long-term skill retention in a complex multiple-task environment. *Ergonomics*, Vol. 43(12), pp. 2043–2064.

Sexton, B., Baughan, C., Elliot, M. & Maycock, G. (2004). *The accident risk of motorcyclists*. Final Report for DfT. PR SE/800/03. Crowthorne: Transport Research Laboratory.

Shankar, U. (2001). *Recent trends in fatal motorcycle crashes*. (DOT HS 809 271.) Washington DC: National Highway Traffic Safety Administration.

Stead, M., Tagg, S., MacKintosh, A.M. & Eadie, D. (2002). Foolsspeed: evaluation of a national theory-based advertising campaign to reduce speeding. Paper presented at the DTLR Behavioural Research in Road Safety: Twelfth Seminar, Dublin, Ireland.

Taylor, M. & Lockwood, C. (1990). *Factors affecting the accident liability of motorcyclists – a multivariate analysis of survey data*. Research Report RR270. Crowthorne: Transport Research Laboratory.

US DOT & Motorcycle Safety Foundation (2000). *National agenda for motorcycle safety.* (DOT HS 809 156.) Washington, DC: Department of Transportation.

Acknowledgements

APPENDIX 1 – OWNERSHIP SURVEY

Sample source	DVLA driver database
Sample details	Scan was limited to motorcycles licensed in the last ten years and was stratified by engine capacity as follows: <50cc 900 50cc–150cc 1000 150cc–200cc 100 200cc–250cc 300 250cc–350cc 100 350cc–500cc 400 500cc+ 2500
Number of surveys posted	5300
Date posted	10 May 2002
Deadline for response	End June 2002
Number returned	1009
Response rate	20%

Section 1

Your motorcycle

1. What motorcycle do you currently use the most?
i) Make……………………………………………………..
ii) Model…………………………………………………
iii) Year of registration..………………………………
iv) Engine size (cc)………………………………………
v) Power (bhp)..………………………………(if known)
vi) Please describe any **performance** modifications made to this motorcycle
(this survey is anonymous and data will not be shared with insurers):

……...………………………………………………………..…
…………...……………………………………......................

2. How did you purchase this motorcycle? *(tick one box only)*
Privately ❏
Trade magazine ❏
Dealer ❏
Internet ❏
Other (please state)…………….....

3. When you purchased your motorcycle was it:
New ❏
Used ❏

Training

4. Have you completed Compulsory Basic Training (CBT)?
Yes ❏ *in what year?………*
No ❏

5. Have you ever completed any voluntary motorcycle training courses (e.g. Bikesafe, Police ride outs)?
No ❏ *please go to question 8*
Yes ❏ *please give details below*

Course title (including provider)
Year Duration
……………………………… ………
……………………………… ………
……………………………… ………

6. Think about the **most recent** course you attended, would you consider the training course was:
*(please place a tick in the appropriate box along **each** scale)*
Useful :__:__:__:__:__: Useless
Easy :__:__:__:__:__: Difficult
Informative :__:__:__:__:__: Non-informative
 1 2 3 4 5

7. What motivated you to attend this training course? *(tick one or more boxes)*
Purchase of an unfamiliar bike ❏
To refresh skills after a break ❏
Involvement in an accident ❏
Other…………………………………………… ❏

Purchasing decisions

8. In the following table please place in order of importance your five main reasons for buying your first motorcycle rather than any other vehicle (e.g. a car).

Write a '1' in the box beside the reason that was most important to you, a '2' in the box beside the second most important reason and so on until you have given 5 boxes in the 'first motorcycle' column a number. Do the same for your 'current motorcycle'.

I bought a motorcycle rather than any other vehicle (e.g. a car) because…	First motorcycle	Current motorcycle
cheaper to buy		
cheaper to run		
cheaper to insure		
image associated		
spare income		
enjoy motorcycle maintenance		
to avoid congestion		
insufficient car parking		
independence and freedom		
to engage in a leisure activity		
too young to drive a car		
love of motorcycles		

Leisure riding

The following section concentrates on leisure riding. A leisure trip is defined as a trip with no real purpose except for the pleasure of riding your motorcycle. Note these are not trips where you ride as part of a group of motorcyclists.
If you never leisure ride, please go to Question 28.

9. When you leisure ride, what proportion is on:
Urban roads ……….. % Motorways ……….. %
Rural roads……………% Race tracks…………%

(the percentages should add up to 100%)

10. When you leisure ride, how far do you usually travel?
0–25 miles ❏
26–50 miles ❏
51–75 miles ❏
76–100 miles ❏
Over 100 miles ❏

11. When leisure riding, do you tend to stay in the county or region (if Scotland) in which you live?
Yes ❏
No ❏

12. Generally, do these rides tend to be completed in a day, over one night, a weekend, a week or more?*(please tick one box only)*
Day ❏
One night stop over ❏
Weekend ❏
Week ❏
More than a week ❏

13. Within one year of you first riding a particular route, how many times are you likely to revisit this same route (from start to finish)?
………………………….……… times within a year.

14. What proportion of your leisure riding takes place during the week and weekend?
……% weekday rides   ……% weekend rides

15. The following table asks about the reasons why you enjoy leisure riding. Each statement asks you to rate your response on a scale of 'agree strongly' to 'disagree strongly'.

Carefully read each statement before **ticking** the appropriate response	Agree strongly	Agree	Neither agree nor disagree	Disagree	Disagree strongly
A good motorcycling route will have…					
wide sweeping roads					
fast downhill roads					
tight bends					
long straights					
'knee down' bends					
impressive views and scenery					
A leisure ride can only be enjoyed…					
on a fine and dry day					
on a road with little traffic					
I get a lot of enjoyment from…					
reaching high speeds					
the independence of motorcycling					
the exhilaration of motorcycling					
the image associated with motorcycling					
testing riding skills					
being closer to the environment					

Riding as a group

The following section concentrates specifically on those occasions where you ride with others, as part of a group. We are interested in those occasions where you set off on a prearranged ride with one or more fellow motorcyclists.
If you never group ride, please go to Question 28.

16. How often do you participate in 'group' rides?
…….. times a month

17. How important is it for you to take part in 'group' rides?
Not at all important:__:__:__:__:__: Very important
                                    1 2 3 4 5

18. On average, how many riders form your group?
…….

19. What is the **one** main factor that identifies your group?
Motorcycle make/model   ❑
Friends   ❑
Common meeting place   ❑
Other   ❑
If other, please state…………………………………

20. Typically, within how many miles of your home do you tend to ride with the group?

0–25 miles   ❑
26–50 miles   ❑
51–75 miles   ❑
76–100 miles   ❑
Over 100 miles   ❑

21. When you leisure ride, do you tend to stay within the county or region (if Scotland) in which you live?
Yes   ❑
No   ❑

22. Within one year of you first riding a particular route, how many times are you likely to revisit this same route (from start to finish)?
…………………………….……… times within a year

23. Do these rides tend to be completed in a day, over one night, a weekend, a week or more? *(please tick one box only)*
Day   ❑
One night stop over   ❑
Weekend   ❑
Week   ❑
More than a week   ❑

24. What proportion of your group riding takes place during the week and weekend?
…% weekday   …% weekend
(the percentages should add up to 100%)

25. How often are you the 'lead' rider in these group rides?
Frequently   ❑
Occasionally   ❑
Never   ❑

26. What is the purpose of the group rides you take part in? (*Please rank the following. Put a '1' in the box that is the most likely purpose, a '2' in the next most likely purpose and so on.*)
No purpose, purely for pleasure   ❑
Campaign rides   ❑
Charity rides   ❑
Organised visits to motorcycling events   ❑
Organised visits to non-motorcycling events ❑

27. What is your **one** main reason for taking part in group rides ?
Social interaction   ❑
Feeling part of a recognised group   ❑
Having routes chosen by those with knowledge ❑
Demonstrating your riding skills   ❑
Other (please specify)…………………………….

Seasonal and weather variations

28. Do you generally tax your motorcycle:
For 6 months of the year ❑…please go to Q29
All year round   ❑…please go to Q30

29. During which months do you tax your motorcycle?
from…………………….. to…………………………

30. The table below allows you to tell us how you use your motorcycle over the course of the year. First, choose the month during which you make most use of your motorcycle. Give this month 100 points.

Now evaluate all the other months of the year in relation to your '100 point' month. For example, if you use your motorcycle most in July (100 points) but only use it half as much in February, award February 50 points. The assigned values do not need to add up to 100. All values must simply be relative to the initial maximum usage '100 point' month.

In the example we have given you, this motorcyclist makes most use of their motorcycle in May and June (equally). In April and July they only use the motorcycle about half as much as in May and June. In August and September, they use it a little and in the rest of the months not at all.

Please now complete the table.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
e.g.	0	0	0	50	100	100	50	10
Your points								
Month	Sep	Oct	Nov	Dec				
e.g.	10	0	0	0				
Your points								

31. How confident are you that you can safely ride your motorcycle in the dark?
Not at all confident :__:__:__:__:__: Very confident
 1 2 3 4 5

32. How confident are you that you can safely ride your motorcycle in wet weather conditions?
Not at all confident :__:__:__:__:__: Very confident
 1 2 3 4 5

33. How confident are you that you can safely ride a motorcycle with which you have relatively little riding experience?
Not at all confident :__:__:__:__:__: Very confident
 1 2 3 4 5

34. For each month of the year please provide details (in the table opposite) of the number of single trips you make by motorcycle for:

- commuting/as part of your work;
- leisure riding (no purpose trips).
- other.

Note: a single trip does not include a return journey, e.g. a trip to work and back counts as 2 trips. Please complete the following table:

Month	Commuting/as part of work	Leisure (no purpose trips)	Other
January			
February			
March			
April			
May			
June			
July			
August			
September			
October			
November			
December			

Accident history

Please read the following definitions before answering questions 35 to 37.

Serious injury accident: where someone was detained in hospital or suffered from serious cuts, burns, fractures, internal injuries, severe shock.
Slight injury accident: such as sprain, bruise, cut and injuries not requiring medical attention.
Damage only accident: where a vehicle was damaged, but nobody was hurt.
Incident: where you came off your motorcycle due to lost tyre/foot grip, lost balance, setting off with wheel lock on, etc.

35. How many accidents have you been involved in over the last three years on your motorcycle?
…….. serious injury accidents
…….. slight injury accidents
…….. damage only accidents

36. How many incidents have you been involved in over the last three years on your motorcycle?
…………………………incidents

If you have been involved in any **accidents** over the last three years, please complete the table on the following pages (pages 14–15) as accurately as possible for each. If you have been involved in any **incidents** where you came off your bike over the last three years, please complete the table on pages 16–17 as accurately as possible for each. If you have been involved in more than five accidents or incidents, please tell us about the five **most recent** for each.

If you have not been involved in any accidents or incidents please go to Question 38.

	Accident 1	**Incident 1**
How severe was the accident?	Serious injury Slight injury Damage only	Serious injury Slight injury Damage only
On which class of road did the accident happen?	Urban Rural a Rural b Motorway	Urban Rural a Rural b Motorway
How many times in a typical month did you travel along this stretch of road?		
How many miles was the accident from your home?		
When did the accident happen?	Month ……… Year…... am ❑ / pm ❑ Weekday ❑ / w/end ❑	Month ……… Year…... am ❑ / pm ❑ Weekday ❑ / w/end ❑
What was the purpose of the trip?		
If you were group riding, were you the lead rider?		
What was the make, model & engine capacity of the motorcycle?		
How long had you been riding this motorcycle?		
Apart from the motorcycle, what else, if anything, was involved?	Stationary vehicle Moving vehicle Pedestrian Animal Object in the road Nothing else	Stationary vehicle Moving vehicle Pedestrian Animal Object in the road Nothing else
Who, if anyone, was mostly to blame?	Yourself Another road user A pedestrian Nobody	Yourself Another road user A pedestrian Nobody
Was the accident reported to the police?	Yes No Don't know	Yes No Don't know

About you

The following questions help to provide us with an idea of who makes up the motorcycling population. Responses will be treated in strictest confidence and all information is greatly appreciated. However if you do not wish to complete certain questions, please feel free to leave these blank.

37. Gender : Male ❑   Female ❑

38. Date of birth: __ __/__ __ /19__ __

39. Are you:
Married ❑
Separated ❑
Divorced ❑
Living with partner ❑
Single, never married ❑
Other ❑

40. What is your highest qualification?
Not applicable ❑
O-Level ❑
GCSE ❑
A-Level ❑
Degree ❑
Postgraduate study ❑
Other……………………………………………

41. Current employment:
Full time ❑
Part time ❑
Unemployed ❑
Retired ❑
Full-time education ❑
Not applicable ❑

42. Occupation:
………………………………………….……………

43. Please provide the **first** half of your postcode (e.g. LS2): ………..………

44. How many children (under 18 years) live at your address? ……………..

45. What is your **gross** (i.e. before tax) annual **personal** income:

Not applicable	❑	£30,000–£34,999	❑
£0–£4,999	❑	£35,000–£39,999	❑
£5,000–£9,999	❑	£40,000–£44,999	❑
£10,000–£14,999	❑	£45,000–£49,999	❑
£15,000–£19,999	❑	£50,000–£54,999	❑
£20,000–£24,999	❑	£55,000–£59,999	❑
£25,000–£29,999	❑	£60,000 +	❑

46. When you have paid for all necessary things that you don't have any choice about (e.g. rent/mortgage, food), how much money do you usually have left each **month** to spend on whatever you choose?

£0–£49	❑	£250–£299	❑
£50–£99	❑	£300–£349	❑
£100–£149	❑	£350–£399	❑
£150–£199	❑	£400 and over	❑
£200–£249	❑		

47. In a typical year, approximately how much do you spend on the following motorcycling items? (Please ignore the cost of petrol, insurance, servicing, tax.)
Motorcycle modifications…………………………
Motorcycle clothing
(e.g. leathers, including helmet) ……..................…
Motorcycle magazines……………………………
Motorcycle accessories ……………………………
Other (please state) ………………………………...

48. In what year did you get your first full **motorcycling** licence?………………….......……

49. Do you currently hold a **car driving** licence?
Yes, I hold a full car licence ❑
Yes, I hold a provisional licence to drive a car ❑
No, I do not hold a car licence ❑

50. In what year did you get this car licence?……………

51. How many motorcycles are registered in your name?
0 ❑
1 ❑
2 ❑
3 ❑
4 ❑
5 or more ❑

52. How many motorcycles are regularly available for you to use?
0 ❑
1 ❑
2 ❑
3 ❑
4 ❑
5 or more ❑

53. How many cars are registered in your name?
0 ❑
1 ❑
2 ❑
3 ❑
4 ❑
5 or more ❑

54. How many cars are regularly available for you to use?
0 ❑
1 ❑
2 ❑
3 ❑
4 ❑
5 or more ❑

Section 2
Your motorcycling history

55. We are interested in the motorcycle(s) you have owned throughout your life. The tables on the following pages lead you from your first motorcycle to your current motorcycle. For each motorcycle you have owned, please provide details of make, model, year of registration, engine size and power. Please also note the year in which you bought this motorcycle and the year in which you got rid of it. Using the key opposite, state the 3 main reasons for buying and the 3 main reasons for eventually getting rid of that motorcycle (most important first).

For example…

In the example, we see that the motorcyclist first bought a Lambretta because they were _restricted to buying a motorcycle of that engine size_. The motorcycle provided more _parking_ opportunities and was a better form of transport to manoeuvre through _congestion_. They got rid of this motorcycle however because they wanted a _larger_

engine with a *higher top speed* and better *styling*. This motorcycle was replaced with a Kawasaki because they had *spare income* and the motorcycle offered a *larger engine capacity* and *higher top speed*. *Raising a family*, *family pressure* and the *need for larger transport* made the motorcyclist get rid of their motorcycle in 1986. In 2000 they bought a Yamaha after a 14-year break because it provided a *leisure activity*, *independence* and they liked the *image* associated with motorcycling.

	Motorcycle details					Years of owner-ship		Reasons… (give 3, most important first)	
	Make	Model	Year of registration	Engine size	Power	From	To	For buying this motorcycle	For getting rid of this motorcycle
First bike	Lambretta	125	1958	125	20	1983	1984	9, 11, 10	11, 12, 13
Bike 2	Kawasaki	ZZR	1984	600	110	1984	1986	4, 5, 1	10, 6, 7
Bike 3	Yamaha	Fazer	2000	1000	143	2000	2002	15, 13, 6	

Reasons for getting rid of the motorcycle
1. Costly repairs
2. Beyond repair
3. Serious accident
4. Loss of thrill/interest
5. Financial reasons
6. Family/peer pressure
7. Need for larger transport
8. Personal age-related factors
9. Rise in insurance prices
10. Raising family
11. Need for larger engine motorcycle
12. Inadequate top speed
13. Poor styling

Reasons for buying the motorcycle
1. Top speed
2. Preferred manufacturer
3. Styling
4. Spare income
5. Engine capacity
6. Image
7. Extra transport
8. Lower running costs
9. Restricted cc for learner
10. To avoid congestion
11. Insufficient parking
12. Cheap to insure
13. Independence
14. Too young to drive car
15. Leisure activity/fun
16. Better handling
17. Touring capability
18. Carrying ability
19. Increased comfort

56. Looking back over your log of motorcycles on the previous pages, are there any points in your life when you gave up riding for a prolonged period (3 years or more)? If so please provide details below.

Between			I gave up riding because…	I started riding again because...
Bike….	and	Bike….		
Bike….	and	Bike….		
Bike….	and	Bike….		
Bike….	and	Bike….		

57. What would make you give up riding in the future? *(Please rank the following. Put a '1' in the box that is the most likely reason, a '2' in the next most likely reason and so on.)*

Serious accident ☐

☐

Rise in insurance prices

Loss of thrill gained from riding ☐

Need for suitable family transport ☐

Age/health-related factors ☐

Family/peer pressure ☐

Other, please state…………………………………

Thank you very much for completing this questionnaire.
Please use the Freepost envelope provided to send this questionnaire back to us.

If you have any additional and relevant comments you would like to make, please use the space provided below:
……………………………………………………………………
……………………………………………………………………
……………………………………………………………………
……………………………………………………………………
……………………………………………………………………
……………………………………………………………………
……………………………………………………………………
……………………………………………………………………
……………………………………………………………………
……………………………………………………………………
……………………………
……………………………………………………………………
……………………………………………………………………
……………………………………………………………………
……………………………………………………………………
……………………………………………………………………
……………………………………………………………………
……………………………………………………………………
……………………………
……………………………………………………………………
……………………………………………………………………
……………………………………………………………………
……………………………………………………………………

APPENDIX 2 – PSYCHOLOGICAL DETERMINANTS SURVEY

Sample source	DVLA driver database
Sample details	Scan was limited to motorcycles licensed in the last ten years and was stratified by engine capacity as follows: <50cc 5300 50cc–150cc 5900 150cc–200cc 500 200cc–250cc 1200 250cc–350cc 300 350cc–500cc 2200 500cc+ 14,900
Number of surveys posted	30,300
Date posted	1 May 2003 onwards in batches
Deadline for response	1 June onwards
Number returned	4929
Response rate	16%

SECTION A: You and your motorcycle

1. Do you currently ride a motorcycle?
   Yes ❑₁ ➔ Go to Q. 2
   No, I last rode ❑₂ ➔ Please complete the
   in: _ _ / _ _ _ _   following questions based
      month year   on the last motorcycle you rode

2. What type of motorcycle do you currently use the most? *(tick ONE box only)*
   Supersport ❑₁
   Sports/touring ❑₂
   Moped ❑₃
   Custom ❑₄
   Traditional ❑₅
   Enduro/track ❑₆
   Touring ❑₇
   Scooter ❑₈
   Other (please specify_____) ❑₉

3. What is the engine size of this motorcycle? _____ cc

4. What is the purpose of the majority of trips you make on this motorcycle? *(tick ONE box only)*
   Mainly commuting or trips as part of work ❑₁
   Mainly leisure trips (trips with no purpose) ❑₂
   Both leisure and commuting trips equally ❑₃
   Other trips only (e.g. errands) ❑₄

5. Have you ever given up riding for ten years or more?
   Yes ❑₁ ➔ Go to Q. 6
   No ❑₂ ➔ Go to Q. 7

6. When did you return to regular riding after this ten-year break?
   Before 1990 ❑₁
   1990 or after ❑₂
   I have not returned to riding ❑₃

7. On average, how many miles have you ridden in the last 12 months? (total mileage on all your motorcycles)
   _____ miles

8. In what year did you start riding? _ _ _ _

9. How many years in total have you been riding motorcycles? If you have ever given up for a prolonged period (more than 12 months) please do not include these breaks from riding. _____ years

10. How and in what **year** did you get your current motorcycling licence? *(tick ONE box only)*
    I ride under 'L' plates on a provisional licence _ _ _ _ year ❑₁
    I passed a practical test before 1981 _ _ _ _ year ❑₂

    I passed the 2 part test in the 80s _ _ _ _ year ❑₃
    I completed CBT, passed a practical test and am restricted to riding a moped _ _ _ _ year ❑₄
    I completed CBT, passed a practical test and am restricted to riding a 25kW/33bhp 'light' motorcycle _ _ _ _ year ❑₅
    I completed CBT, passed a practical test and am no longer restricted _ _ _ _ year ❑₆
    I passed a Direct Access course _ _ _ _ year ❑₇
    I passed an Accelerated Access course _ _ _ _ year ❑₈
    I do not hold a full licence, I passed my car driving test before Feb. 2001 and ride a moped on this licence under the category P entitlement ❑₉

11. Do you currently hold a **car** driving licence **and** in what **year** did you get this licence?
    Yes, I hold a full driving licence ❑₁ _ _ _ _ year
    Yes, I hold a provisional licence ❑₂ _ _ _ _ year
    No, I do not hold a driving licence ❑₃

12. Sex:
    Male ❑₁   Female ❑₂

13. What is your date of birth? _ _ / _ _ / 19_ _
       day month year

14. Please provide the first half of your postcode (e.g. LS2). This info helps us to look at the geographical distribution of UK motorcyclists _____

15. Are you: *(tick ONE box only)*
    Married ❑₁
    Separated ❑₂
    Living with partner ❑₃
    Divorced ❑₄
    Single, never married ❑₅
    Other ❑₆

16. How many children (under 18 years old) live at your address?
    0 ❑₁   3 ❑₄
    1 ❑₂   4 ❑₅
    2 ❑₃   5 or more ❑₆

17. What is your gross (before tax) annual **personal** income?

Not applicable	$\Box_1$	£30,000–£34,999 $\Box_8$
£0–£4,999	$\Box_2$	£35,000–£39,999 $\Box_9$
£5,000–£9,999	$\Box_3$	£40,000–£44,999 $\Box_{10}$
£10,000–£14,999	$\Box_4$	£45,000–£49,999 $\Box_{11}$
£15,000–£19,999	$\Box_5$	£50,000–£54,999 $\Box_{12}$
£20,000–£24,999	$\Box_6$	£55,000–£59,999 $\Box_{13}$
£25,000–£29,999	$\Box_7$	£60,000+ $\Box_{14}$

18. When you have paid for all necessary things that you don't have any choice about (rent/mortgage, food) how much money do you usually have left each **month** to spend on whatever you choose?

£0–£49	$\Box_1$	£250–£299 $\Box_6$
£50–£99	$\Box_2$	£300–£349 $\Box_7$
£100–£149	$\Box_3$	£350–£399 $\Box_8$
£150–£199	$\Box_4$	£400 and over $\Box_9$
£200–£249	$\Box_5$	

The following questions refer to your current main job (or, if you are not working, your last main job).

19. Are you? *(tick ONE box only)*

Employed	$\Box_1$	➔ Go to Q. 20
Retired	$\Box_2$	➔ Go to Q. 20
Unemployed	$\Box_3$	➔ Go to Q. 20
Student/never worked	$\Box_4$	➔ Go to Section B

20. Do (did) you work as an employee or are (were) you self-employed?

Employee	$\Box_1$	➔ Go to Q. 21
Self-employed with employees	$\Box_2$	➔ Go to Q. 21
Self-employed/freelance without employees	$\Box_3$	➔ Go to Q. 23

21. **For employees:** indicate below how many people work (worked) for your employer or where you work (worked).

    For self-employed: indicate below how many people you employ (employed). **Go to question 23** when you have completed this.

1 to 24	$\Box_1$
25 or more	$\Box_2$

22. Do (did) you supervise any other employees? (A supervisor or foreman is responsible for overseeing the work of other employees on a day-to-day basis.)

Yes	$\Box_1$
No	$\Box_2$

	Please tick the box to show which best describes the sort of work you do. (If you are not working now, please tick a box to show what you did in your last job.)	
	Modern professional occupations Such as teacher-nurse-physiotherapist-social worker-welfare officer-artist-musician-police officer (sergeant or above)-software designer	$\Box_1$
	Clerical and intermediate occupations Such as secretary-personal assistant-clerical worker-office clerk-call centre-agent-nursing auxiliary-nursery nurse	$\Box_2$
	Senior managers or administrators (usually responsible for planning, organising and co-ordinating work and for finance) Such as finance manager-chief executive	$\Box_3$
	Technical and craft occupations Such as motor mechanic-fitter-inspector-plumber-printer-tool maker-electrician-gardener-train driver	$\Box_4$
	Semi-routine manual and service occupations Such as postal worker-machine operative-security guard-caretaker-factory worker-catering assistant-receptionist-sales assistant	$\Box_5$
	Routine manual and service occupations Such as HGV driver-van driver-cleaner-porter-packer-sewing machinist-labourer-waiter/waitress-bar staff	$\Box_6$
	Middle or junior manager Such as office manager-retail manager-bank manager-restaurant manager-warehouse manager-publican	$\Box_7$
	Traditional professional occupation Such as accountant-solicitor-medical practitioner-scientist-civil/mechanical engineer	$\Box_8$

Many of the questions over the next pages follow the same format. They provide you with a statement and ask you to rate your response on a numbered scale from strongly disagree to strongly agree, unlikely to likely, very much to not very much etc. Carefully read both the statement and response before **circling the number** which best reflects your position on the scale (some questions require you to circle a number on several lines). **If you do not currently ride a motorcycle please go straight to question 5.**

1. How likely do you think you are to have a serious accident on your motorcycle needing hospital treatment in the next year <u>compared</u> with the following road users:

Other motorcyclists	**Much less likely**	1 2 3 4 5	**Much more likely**
Car drivers	**Much less likely**	1 2 3 4 5	**Much more likely**
Pedal cyclists	**Much less likely**	1 2 3 4 5	**Much more likely**
Pedestrians	**Much less likely**	1 2 3 4 5	**Much more likely**

2. What do you estimate is the risk that you will have a fatal accident on your motorcycle this year? *(Tick ONE box only) (note: risk of a car driver being involved in fatal accident is 1 in 20,000)*

1 in 100 ❑$_1$
1 in 500 ❑$_2$
1 in 1000 ❑$_3$
1 in 1500 ❑$_4$
1 in 2000 ❑$_5$
1 in 2500 ❑$_6$

3. What do you estimate is the risk that you will be seriously injured on your motorcycle this year? *(Tick ONE box only) (note: risk of a car driver being seriously injured is 1 in 2000)*

1 in 70 ❑$_1$
1 in 100 ❑$_2$
1 in 130 ❑$_3$
1 in 160 ❑$_4$
1 in 190 ❑$_5$
1 in 220 ❑$_6$

4. If you had an accident in the next year needing hospital treatment, how seriously do you think it would affect your:

Working life	**Very little**	1 2 3 4 5	**Very much**
Family life	**Very little**	1 2 3 4 5	**Very much**
Social life	**Very little**	1 2 3 4 5	**Very much**
Personal life	**Very little**	1 2 3 4 5	**Very much**

5. I see myself as a safe motorcyclist   **Strongly disagree**   1 2 3 4 5 6 7   **Strongly agree**

On the next few pages we have described three motorcycling scenarios. Each scenario is followed by a number of statements and responses relating to motorcyclists' thoughts and beliefs. Please circle the number which best reflect s your response. Although these statements appear repetitive, we would be grateful if you completed each response.

Imagine you are riding alone along a **motorway**. It is a fine, dry day and the traffic is fairly light. You move into the outside lane where you **exceed the 70mph speed limit**.

The following questions all relate to <u>riding in these circumstances and on this road type</u>. Please circle the number which best reflects your response.

Exceeding the 70mph speed limit would be… **(circle one number <u>per line</u>):**

	1	2	3	4	5	6	7	
Unsafe	1	2	3	4	5	6	7	**Safe**
Useful	1	2	3	4	5	6	7	**Useless**
Unsatisfying	1	2	3	4	5	6	7	**Satisfying**
Beneficial	1	2	3	4	5	6	7	**Harmful**
Not enjoyable	1	2	3	4	5	6	7	**Enjoyable**
Positive	1	2	3	4	5	6	7	**Negative**
Reckless	1	2	3	4	5	6	7	**Cautious**
Good	1	2	3	4	5	6	7	**Bad**

1.	Exceeding the 70mph speed limit would increase the risk of my being involved in an accident	**Unlikely**	1 2 3 4 5 6 7						**Likely**
2.	Increasing the risk of being involved in an accident would be...	**Good**	1 2 3 4 5 6 7						**Bad**
3.	Exceeding the 70mph speed limit would allow me to 'beat' the traffic	**Unlikely**	1 2 3 4 5 6 7						**Likely**
4.	'Beating' the traffic would be...	**Good**	1 2 3 4 5 6 7						**Bad**
5.	Exceeding the 70mph speed limit would increase the risk of my being caught by the police for speeding	**Unlikely**	1 2 3 4 5 6 7						**Likely**
6.	Being caught by the police for speeding would be...	**Good**	1 2 3 4 5 6 7						**Bad**
7.	Exceeding the 70mph speed limit would allow me to test the top speed of my motorcycle	**Unlikely**	1 2 3 4 5 6 7						**Likely**
8.	Testing the top speed of my motorcycle would be...	**Good**	1 2 3 4 5 6 7						**Bad**
9.	Exceeding the 70mph speed limit would make me feel exhilarated	**Unlikely**	1 2 3 4 5 6 7						**Likely**
10.	Feeling exhilarated would be...	**Good**	1 2 3 4 5 6 7						**Bad**
11.	Exceeding the 70mph speed limit would make me feel anxious	**Unlikely**	1 2 3 4 5 6 7						**Likely**
12.	Feeling anxious would be...	**Good**	1 2 3 4 5 6 7						**Bad**
13.	I would intend to exceed the 70mph speed limit	**Unlikely**	1 2 3 4 5 6 7						**Likely**
14.	I would want to exceed the 70mph speed limit	**Strongly disagree**	1 2 3 4 5 6 7						**Strongly agree**
15.	I would plan to exceed the 70mph speed limit	**Definitely would not**	1 2 3 4 5 6 7						**Definitely would**
16.	The police would disapprove of me exceeding the 70mph speed limit	**Strongly agree**	1 2 3 4 5 6 7						**Strongly disagree**
17.	Generally speaking, how much do you want to do what the police think you should do?	**Not at all**	1 2 3 4 5 6 7						**Very much**

18.	Other road users would disapprove of me exceeding the 70mph speed limit	**Strongly agree**	1	2	3	4	5	6	7	**Strongly disagree**
19.	Generally speaking, how much do you want to do what other road users think you should do?	**Not at all**	1	2	3	4	5	6	7	**Very much**
20.	My family would disapprove of me exceeding the 70mph speed limit	**Strongly agree**	1	2	3	4	5	6	7	**Strongly disagree**
21.	Generally speaking, how much do you want to do what your family think you should do?	**Not at all**	1	2	3	4	5	6	7	**Very much**
22.	Other bikers would disapprove of me exceeding the 70mph speed limit	**Strongly agree**	1	2	3	4	5	6	7	**Strongly disagree**
23.	Generally speaking, how much do you want to do what other bikers think you should do?	**Not at all**	1	2	3	4	5	6	7	**Very much**
24.	For me to exceed the 70mph speed limit would be…	**Easy**	1	2	3	4	5	6	7	**Difficult**
25.	If I wanted to, I could easily exceed the 70mph speed limit	**Strongly agree**	1	2	3	4	5	6	7	**Strongly disagree**
26.	How much control would you have over exceeding the 70mph speed limit?	**Complete control**	1	2	3	4	5	6	7	**No control**
27.	I would feel in complete control of whether I exceeded the 70mph speed limit	**Strongly agree**	1	2	3	4	5	6	7	**Strongly disagree**
28.	It would be entirely up to me whether I exceeded the 70mph speed limit	**Strongly agree**	1	2	3	4	5	6	7	**Strongly disagree**
29.	How confident are you that you would be able to exceed the 70mph speed limit?	**Not very confident**	1	2	3	4	5	6	7	**Very confident**
30.	I ride on the motorway when the weather is fine and dry	**Frequently**	1	2	3	4	5	6	7	**Never**
31.	Riding on a fine and dry day makes my exceeding the 70mph speed limit...	**Less likely**	1	2	3	4	5	6	7	**More likely**
32.	The motorway road surfaces I ride on are smooth and even	**Frequently**	1	2	3	4	5	6	7	**Never**
33.	Riding on motorways that are smooth and even makes my exceeding the 70mph speed limit...	**Less likely**	1	2	3	4	5	6	7	**More likely**
34.	I ride a powerful and reliable motorcycle on the motorway	**Frequently**	1	2	3	4	5	6	7	**Never**
35.	Riding a powerful and reliable motorcycle makes my exceeding the 70mph speed limit...	**Less likely**	1	2	3	4	5	6	7	**More likely**
36.	There is little traffic when I ride on the motorway	**Frequently**	1	2	3	4	5	6	7	**Never**
37.	Riding on a motorway with little traffic makes my exceeding the 70mph speed limit...	**Less likely**	1	2	3	4	5	6	7	**More likely**
38.	There is a high police presence when I ride on the motorway	**Frequently**	1	2	3	4	5	6	7	**Never**
39.	A high police presence on the motorway makes my exceeding the 70mph speed limit...	**Less likely**	1	2	3	4	5	6	7	**More likely**
40.	It would be quite wrong for me to exceed the 70mph speed limit	**Strongly agree**	1	2	3	4	5	6	7	**Strongly disagree**
41.	I would regret exceeding the 70mph speed limit	**Likely**	1	2	3	4	5	6	7	**Unlikely**
42.	If I exceeded the 70mph speed limit, I would feel sorry for doing so	**Likely**	1	2	3	4	5	6	7	**Unlikely**
43.	How often have you exceeded the 70mph speed limit?	**Never**	1	2	3	4	5	6	7	**Frequently**
44.	In the past I have frequently exceeded the 70mph speed limit	**Strongly disagree**	1	2	3	4	5	6	7	**Strongly agree**

45.	What is the risk of being involved in an accident if you exceed the 70mph speed limit?	**Very low risk**	1	2	3	4	5	6	7	**Very high risk**
46.	What is the risk of being involved in an accident if you <u>do not</u> exceed the 70mph speed limit?	**Very low risk**	1	2	3	4	5	6	7	**Very high risk**

Imagine you are riding along an **urban road** which you know has pedestrian crossings at various points along it. You are riding alone. It is a fine, dry day with good visibility but the road is relatively busy. You are paying attention to the main traffic and you **maintain a safe distance to the vehicle in front**.

The following questions all relate to <u>riding in these circumstances and on this road type.</u> Please circle the number which best reflects your response.

For me to maintain a safe distance to the vehicle in front would be… **(circle one number <u>per line</u>)**:

Unsafe	1	2	3	4	5	6	7	**Safe**
Useful	1	2	3	4	5	6	7	**Useless**
Unsatisfying	1	2	3	4	5	6	7	**Satisfying**
Beneficial	1	2	3	4	5	6	7	**Harmful**
Not enjoyable	1	2	3	4	5	6	7	**Enjoyable**
Positive	1	2	3	4	5	6	7	**Negative**
Reckless	1	2	3	4	5	6	7	**Cautious**
Good	1	2	3	4	5	6	7	**Bad**

47.	Maintaining a safe distance to the vehicle in front would reduce the risk of me hitting that vehicle	**Unlikely**	1	2	3	4	5	6	7	**Likely**
48.	Reducing the risk of hitting the vehicle in front would be...	**Good**	1	2	3	4	5	6	7	**Bad**
49.	Maintaining a safe distance to the vehicle in front would increase the likelihood of vehicles 'pressurising' me from behind	**Unlikely**	1	2	3	4	5	6	7	**Likely**
50.	Being 'pressurised' from behind would be...	**Good**	1	2	3	4	5	6	7	**Bad**
51.	Maintaining a safe distance to the vehicle in front would give me longer to brake if I needed to	**Unlikely**	1	2	3	4	5	6	7	**Likely**
52.	Having longer to brake would be...	**Good**	1	2	3	4	5	6	7	**Bad**
53.	Maintaining a safe distance to the vehicle in front would not allow me to keep up with the traffic	**Unlikely**	1	2	3	4	5	6	7	**Likely**
54.	Not keeping up with the traffic would be...	**Good**	1	2	3	4	5	6	7	**Bad**
55.	Maintaining a safe distance to the vehicle in front would make me feel safer	**Unlikely**	1	2	3	4	5	6	7	**Likely**
56.	Feeling safer would be...	**Good**	1	2	3	4	5	6	7	**Bad**
57.	Maintaining a safe distance to the vehicle in front would make me feel frustrated	**Unlikely**	1	2	3	4	5	6	7	**Likely**
58.	Feeling frustrated would be...	**Good**	1	2	3	4	5	6	7	**Bad**
59.	I would intend to maintain a safe distance to the vehicle in front	**Unlikely**	1	2	3	4	5	6	7	**Likely**
60.	I would want to maintain a safe distance to the vehicle in front	**Strongly disagree**	1	2	3	4	5	6	7	**Strongly agree**
61.	I would plan to maintain a safe distance to the vehicle in front	**Definitely would not**	1	2	3	4	5	6	7	**Definitely would**

No.	Question		1	2	3	4	5	6	7	
62.	The police would approve of me maintaining a safe distance to the vehicle in front	Strongly agree	1	2	3	4	5	6	7	Strongly disagree
63.	Other road users would approve of me maintaining a safe distance to the vehicle in front	Strongly agree	1	2	3	4	5	6	7	Strongly disagree
64.	My family would approve of me maintaining a safe distance to the vehicle in front	Strongly agree	1	2	3	4	5	6	7	Strongly disagree
65.	Other bikers would approve of me maintaining a safe distance to the vehicle in front	Strongly agree	1	2	3	4	5	6	7	Strongly disagree
66.	For me to maintain a safe distance to the vehicle in front would be…	Easy	1	2	3	4	5	6	7	Difficult
67.	If I wanted to, I could easily maintain a safe distance to the vehicle in front	Strongly agree	1	2	3	4	5	6	7	Strongly disagree
68.	How much control would you have over maintaining a safe distance to the vehicle in front?	Complete control	1	2	3	4	5	6	7	No control
69.	I would feel in complete control of whether I maintained a safe distance to the vehicle in front	Strongly agree	1	2	3	4	5	6	7	Strongly disagree
70.	It would be entirely up to me whether I maintained a safe distance to the vehicle in front	Strongly agree	1	2	3	4	5	6	7	Strongly disagree
71.	How confident are you that you would be able to maintain a safe distance to the vehicle in front?	Not very confident	1	2	3	4	5	6	7	Very confident
72.	I am in a rush on urban roads	Frequently	1	2	3	4	5	6	7	Never
73.	Being in a rush makes my maintaining a safe distance to the vehicle in front...	Less likely	1	2	3	4	5	6	7	More likely
74.	Drivers in front of me on urban roads move too slowly	Frequently	1	2	3	4	5	6	7	Never
75.	A slow driver in front of me on a urban road makes my maintaining a safe distance to the vehicle in front...	Less likely	1	2	3	4	5	6	7	More likely
76.	Vehicles usually travel behind me on urban roads	Frequently	1	2	3	4	5	6	7	Never
77.	A vehicle behind me on an urban road makes my maintaining a safe distance to the vehicle in front...	Less likely	1	2	3	4	5	6	7	More likely
78.	There is little traffic when I ride on urban roads	Frequently	1	2	3	4	5	6	7	Never
79.	Riding on urban roads with little traffic makes my maintaining a safe distance to the vehicle in front...	Less likely	1	2	3	4	5	6	7	More likely
80.	There is merging traffic when I ride on urban roads	Frequently	1	2	3	4	5	6	7	Never
81.	Merging traffic on urban roads makes my maintaining a safe distance to the vehicle in front...	Less likely	1	2	3	4	5	6	7	More likely
82.	It would be quite wrong for me not to maintain a safe distance to the vehicle in front	Strongly agree	1	2	3	4	5	6	7	Strongly disagree
83.	I would regret not maintaining a safe distance to the vehicle in front	Likely	1	2	3	4	5	6	7	Unlikely
84.	If I failed to maintain a safe distance to the vehicle in front, I would feel sorry for doing so	Likely	1	2	3	4	5	6	7	Unlikely
85.	How often have you maintained a safe distance to the vehicle in front?	Never	1	2	3	4	5	6	7	Frequently
86.	In the past I have frequently maintained a safe distance to the vehicle in front	Strongly disagree	1	2	3	4	5	6	7	Strongly agree
87.	What is the risk of being involved in an accident if you maintain a safe distance to the vehicle in front?	Very low risk	1	2	3	4	5	6	7	Very high risk

88.   What is the risk of being involved in an accident if you <u>do not</u> maintain a safe distance to the vehicle in front?   **Very low risk** 1 2 3 4 5 6 7 **Very high risk**

Imagine you are riding alone, along a broad, relatively straight **rural road**. It is a fine, dry day with good visibility and the road is almost empty. Ahead the road appears straight and clear. You decide to **really go for it**, open up the throttle and accelerate the bike up to high speed.

The following questions all relate to <u>riding in these circumstances and on this road type</u>. Please circle the number which best reflects your response.

1. For me to really go for it would be… **(circle one number <u>per line</u>):**

Unsafe	1	2	3	4	5	6	7	**Safe**
Useful	1	2	3	4	5	6	7	**Useless**
Unsatisfying	1	2	3	4	5	6	7	**Satisfying**
Beneficial	1	2	3	4	5	6	7	**Harmful**
Not enjoyable	1	2	3	4	5	6	7	**Enjoyable**
Positive	1	2	3	4	5	6	7	**Negative**
Reckless	1	2	3	4	5	6	7	**Cautious**
Good	1	2	3	4	5	6	7	**Bad**

2. Really going for it would test my riding skills — **Unlikely** 1 2 3 4 5 6 7 **Likely**

3. Testing my riding skills would be... — **Good** 1 2 3 4 5 6 7 **Bad**

4. Really going for it would increase the risk of my being involved in an accident — **Unlikely** 1 2 3 4 5 6 7 **Likely**

5. Being in an accident would be... — **Good** 1 2 3 4 5 6 7 **Bad**

6. Really going for it would damage my motorcycle — **Unlikely** 1 2 3 4 5 6 7 **Likely**

7. Damaging my motorcycle would be... — **Good** 1 2 3 4 5 6 7 **Bad**

8. Really going for it would test my motorcycle's top speed — **Unlikely** 1 2 3 4 5 6 7 **Likely**

9. Testing my motorcycle's top speed would be... — **Good** 1 2 3 4 5 6 7 **Bad**

10. Really going for it would make me feel exhilarated — **Unlikely** 1 2 3 4 5 6 7 **Likely**

11. Feeling exhilarated would be... — **Good** 1 2 3 4 5 6 7 **Bad**

12. Really going for it would make me feel anxious — **Unlikely** 1 2 3 4 5 6 7 **Likely**

13. Feeling anxious would be... — **Good** 1 2 3 4 5 6 7 **Bad**

14. I would intend to really go for it — **Unlikely** 1 2 3 4 5 6 7 **Likely**

15. I would want to really go for it — **Strongly disagree** 1 2 3 4 5 6 7 **Strongly agree**

16. I would plan to really go for it — **Definitely would not** 1 2 3 4 5 6 7 **Definitely would**

17. The police would disapprove of me really going for it — **Strongly agree** 1 2 3 4 5 6 7 **Strongly disagree**

18. Generally speaking, how much do you want to do what the police think you should do? — **Not at all** 1 2 3 4 5 6 7 **Very much**

19. Other road users would disapprove of me really going for it — **Strongly agree** 1 2 3 4 5 6 7 **Strongly disagree**

20.	Generally speaking, how much do you want to do what other road users think you should do?	Not at all	1	2	3	4	5	6	7	Very much
21.	My family would disapprove of me really going for it	Strongly agree	1	2	3	4	5	6	7	Strongly disagree
22.	Generally speaking, how much do you want to do what your family think you should do?	Not at all	1	2	3	4	5	6	7	Very much
23.	Other bikers would disapprove of me really going for it	Strongly agree	1	2	3	4	5	6	7	Strongly disagree
24.	Generally speaking, how much do you want to do what other bikers think you should do?	Not at all	1	2	3	4	5	6	7	Very much
25.	For me to really go for it would be…	Easy	1	2	3	4	5	6	7	Difficult
26.	If I wanted to, I could easily really go for it	Strongly agree	1	2	3	4	5	6	7	Strongly disagree
27.	How much control would you have over really going for it?	Complete control	1	2	3	4	5	6	7	No control
28.	I would feel in complete control of whether I went for it	Strongly agree	1	2	3	4	5	6	7	Strongly disagree
29.	It would be entirely up to me whether I went for it	Strongly agree	1	2	3	4	5	6	7	Strongly disagree
30.	How confident are you that you would be able to really go for it?	Not very confident	1	2	3	4	5	6	7	Very confident
31.	I ride on rural roads when the weather is fine and dry	Frequently	1	2	3	4	5	6	7	Never
32.	Riding on a fine and dry day makes my really going for it...	Less likely	1	2	3	4	5	6	7	More likely
33.	The rural roads I ride on are smooth and even	Frequently	1	2	3	4	5	6	7	Never
34.	Riding on rural roads that are smooth and even makes my really going for it...	Less likely	1	2	3	4	5	6	7	More likely
35.	I ride a powerful and reliable motorcycle on rural roads	Frequently	1	2	3	4	5	6	7	Never
36.	Riding a powerful and reliable motorcycle on rural roads makes my really going for it...	Less likely	1	2	3	4	5	6	7	More likely
37.	The rural roads I ride on have little traffic	Frequently	1	2	3	4	5	6	7	Never
38.	Riding on rural roads with little traffic makes my really going for it...	Less likely	1	2	3	4	5	6	7	More likely
39.	I ride on rural roads that are familiar to me	Frequently	1	2	3	4	5	6	7	Never
40.	Riding on familiar rural roads makes my really going for it...	Less likely	1	2	3	4	5	6	7	More likely
41.	It would be quite wrong for me to really go for it	Strongly agree	1	2	3	4	5	6	7	Strongly disagree
42.	I would regret really going for it	Likely	1	2	3	4	5	6	7	Unlikely
43.	If I had really gone for it, I would feel sorry for doing so	Likely	1	2	3	4	5	6	7	Unlikely
44.	How often have you really gone for it?	Never	1	2	3	4	5	6	7	Frequently
45.	In the past I have frequently really gone for it	Strongly disagree	1	2	3	4	5	6	7	Strongly agree
46.	What is the risk of being involved in an accident if you really go for it?	Very low risk	1	2	3	4	5	6	7	Very high risk
47.	What is the risk of being involved in an accident if you do not really go for it?	Very low risk	1	2	3	4	5	6	7	Very high risk

Imagine you are riding along a **residential road** with cars parked either side and connecting side roads at various points. You are riding alone. Because of the parked cars it is difficult to see any vehicles emerging from the side roads or for them to see you. You try to **pay attention to these emerging vehicles**.

The following questions all relate to <u>riding in these circumstances and on this road type</u>. Please circle the number which best reflects your response.

48. For me to pay attention to emerging vehicles would be… **(circle one number <u>per line</u>):**

Unsafe	1	2	3	4	5	6	7	**Safe**
Useful	1	2	3	4	5	6	7	**Useless**
Unsatisfying	1	2	3	4	5	6	7	**Satisfying**
Beneficial	1	2	3	4	5	6	7	**Harmful**
Not enjoyable	1	2	3	4	5	6	7	**Enjoyable**
Positive	1	2	3	4	5	6	7	**Negative**
Reckless	1	2	3	4	5	6	7	**Cautious**
Good	1	2	3	4	5	6	7	**Bad**

49. Paying attention to emerging vehicles would reduce the risk of my being involved in an accident — **Unlikely** 1 2 3 4 5 6 7 **Likely**

50. Reducing the risk of being in an accident would be... — **Good** 1 2 3 4 5 6 7 **Bad**

51. Paying attention to emerging vehicles would distract me from concentrating on the road ahead — **Unlikely** 1 2 3 4 5 6 7 **Likely**

52. Being distracted from concentrating on the road ahead would be... — **Good** 1 2 3 4 5 6 7 **Bad**

53. Paying attention to emerging vehicles would reduce the severity of any accident I was involved in — **Unlikely** 1 2 3 4 5 6 7 **Likely**

54. Reducing the severity of an accident would be... — **Good** 1 2 3 4 5 6 7 **Bad**

55. Paying attention to emerging vehicles would mean I have to work harder — **Unlikely** 1 2 3 4 5 6 7 **Likely**

56. Working harder would be... — **Good** 1 2 3 4 5 6 7 **Bad**

57. Paying attention to emerging vehicles would make me feel safer — **Unlikely** 1 2 3 4 5 6 7 **Likely**

58. Feeling safer would be... — **Good** 1 2 3 4 5 6 7 **Bad**

59. Paying attention to emerging vehicles would make me feel frustrated — **Unlikely** 1 2 3 4 5 6 7 **Likely**

60. Feeling frustrated would be... — **Good** 1 2 3 4 5 6 7 **Bad**

61. I would intend to pay attention to emerging vehicles — **Unlikely** 1 2 3 4 5 6 7 **Likely**

62. I would want to pay attention to emerging vehicles — **Strongly disagree** 1 2 3 4 5 6 7 **Strongly agree**

63. I would plan to pay attention to emerging vehicles — **Definitely would not** 1 2 3 4 5 6 7 **Definitely would**

64. The police would approve of me paying attention to emerging vehicles — **Strongly agree** 1 2 3 4 5 6 7 **Strongly disagree**

65. Other road users would approve of me paying attention to emerging vehicles — **Strongly agree** 1 2 3 4 5 6 7 **Strongly disagree**

#	Statement	Left anchor	1	2	3	4	5	6	7	Right anchor
66.	My family would approve of me paying attention to emerging vehicles	Strongly agree	1	2	3	4	5	6	7	Strongly disagree
67.	Other bikers would approve of me paying attention to emerging vehicles	Strongly agree	1	2	3	4	5	6	7	Strongly disagree
68.	For me to pay attention to emerging vehicles would be…	Easy	1	2	3	4	5	6	7	Difficult
69.	If I wanted to, I could easily pay attention to emerging vehicles	Strongly agree	1	2	3	4	5	6	7	Strongly disagree
70.	How much control would you have over paying attention to emerging vehicles?	Complete control	1	2	3	4	5	6	7	No control
71.	I would feel in complete control of whether I paid attention to emerging vehicles	Strongly agree	1	2	3	4	5	6	7	Strongly disagree
72.	It would be entirely up to me whether I paid attention to emerging vehicles	Strongly agree	1	2	3	4	5	6	7	Strongly disagree
73.	How confident are you that you would be able to pay attention to emerging vehicles?	Not very confident	1	2	3	4	5	6	7	Very confident
74.	Residential roads I ride on have little traffic	Frequently	1	2	3	4	5	6	7	Never
75.	Little traffic on residential roads makes my paying attention to emerging vehicles...	Less likely	1	2	3	4	5	6	7	More likely
76.	I am in a rush when riding on residential roads	Frequently	1	2	3	4	5	6	7	Never
77.	Being in a rush makes paying attention to emerging vehicles...	Less likely	1	2	3	4	5	6	7	More likely
78.	I ride on residential roads during the day	Frequently	1	2	3	4	5	6	7	Never
79.	Riding in the day makes my paying attention to emerging vehicles...	Less likely	1	2	3	4	5	6	7	More likely
80.	I am tired when riding on residential roads	Frequently	1	2	3	4	5	6	7	Never
81.	Being tired makes my paying attention to emerging vehicles...	Less likely	1	2	3	4	5	6	7	More likely
82.	There are a lot of parked vehicles on residential roads	Frequently	1	2	3	4	5	6	7	Never
83.	The parked vehicles on residential roads make my paying attention to emerging vehicles...	Less likely	1	2	3	4	5	6	7	More likely
84.	It would be quite wrong for me not to pay attention to emerging vehicles	Strongly agree	1	2	3	4	5	6	7	Strongly disagree
85.	I would regret not paying attention to emerging vehicles	Likely	1	2	3	4	5	6	7	Unlikely
86.	If I had not paid attention to emerging vehicles, I would feel sorry for not doing so	Likely	1	2	3	4	5	6	7	Unlikely
87.	How often have you paid attention to emerging vehicles?	Never	1	2	3	4	5	6	7	Frequently
88.	In the past I have frequently paid attention to emerging vehicles	Strongly disagree	1	2	3	4	5	6	7	Strongly agree
89.	What is the risk of being involved in an accident if you pay attention to emerging vehicles?	Very low risk	1	2	3	4	5	6	7	Very high risk
90.	What is the risk of being involved in an accident if you do not pay attention to emerging vehicles?	Very low risk	1	2	3	4	5	6	7	Very high risk

You are riding along an open **rural road**. You are riding alone. It is a fine, dry day with good visibility and the road is relatively clear. Ahead a road sign indicates the road bends to the left. You cannot see how sharp the bend is but up to now the road has been good with relatively gentle bends. You decide to proceed, believing you know the nature of the road and **not brake as you approach the bend**.

The following questions all relate to <u>riding in these circumstances and on this road type</u>. Please circle the number which best reflects your response.

1. For me not to brake as I approach the bend would be… **(circle one number <u>per line</u>)**:

Unsafe	1	2	3	4	5	6	7	**Safe**
Useful	1	2	3	4	5	6	7	**Useless**
Unsatisfying	1	2	3	4	5	6	7	**Satisfying**
Beneficial	1	2	3	4	5	6	7	**Harmful**
Not enjoyable	1	2	3	4	5	6	7	**Enjoyable**
Positive	1	2	3	4	5	6	7	**Negative**
Reckless	1	2	3	4	5	6	7	**Cautious**
Good	1	2	3	4	5	6	7	**Bad**

2. Not braking as I approach the bend would increase the chance of me coming off my motorcycle — **Unlikely** 1 2 3 4 5 6 7 **Likely**

3. Coming off my motorcycle would be... — **Good** 1 2 3 4 5 6 7 **Bad**

4. Not braking as I approach the bend would allow me to test the performance of my motorcycle — **Unlikely** 1 2 3 4 5 6 7 **Likely**

5. Testing the performance of my motorcycle would be... — **Good** 1 2 3 4 5 6 7 **Bad**

6. Not braking as I approach the bend would increase the risk of me suffering an injury — **Unlikely** 1 2 3 4 5 6 7 **Likely**

7. Suffering an injury would be... — **Good** 1 2 3 4 5 6 7 **Bad**

8. Not braking as I approach the bend would allow me to test my riding skills — **Unlikely** 1 2 3 4 5 6 7 **Likely**

9. Testing my riding skills would be... — **Good** 1 2 3 4 5 6 7 **Bad**

10. Not braking as I approach the bend would make me feel exhilarated — **Unlikely** 1 2 3 4 5 6 7 **Likely**

11. Feeling exhilarated would be... — **Good** 1 2 3 4 5 6 7 **Bad**

12. Not braking as I approach the bend would make me feel anxious — **Unlikely** 1 2 3 4 5 6 7 **Likely**

13. Feeling anxious would be... — **Good** 1 2 3 4 5 6 7 **Bad**

14. I would intend not to brake as I approach the bend — **Unlikely** 1 2 3 4 5 6 7 **Likely**

15. I would want to not brake as I approach the bend — **Strongly disagree** 1 2 3 4 5 6 7 **Strongly agree**

16. I would plan not to brake as I approach the bend — **Definitely would not** 1 2 3 4 5 6 7 **Definitely would**

17. The police would disapprove of me not braking as I approach the bend — **Strongly agree** 1 2 3 4 5 6 7 **Strongly disagree**

18. Generally speaking, how much do you want to do what the police think you should do? — **Not at all** 1 2 3 4 5 6 7 **Very much**

19. Other road users would disapprove of me not braking as I approach the bend — **Strongly agree** 1 2 3 4 5 6 7 **Strongly disagree**

20.	Generally speaking, how much do you want to do what other road users think you should do?	**Not at all**	1	2	3	4	5	6	7	**Very much**
21.	My family would disapprove of me not braking as I approach the bend	**Strongly agree**	1	2	3	4	5	6	7	**Strongly disagree**
22.	Generally speaking, how much do you want to do what your family think you should do?	**Not at all**	1	2	3	4	5	6	7	**Very much**
23.	Other bikers would disapprove of me not braking as I approach the bend	**Strongly agree**	1	2	3	4	5	6	7	**Strongly disagree**
24.	Generally speaking, how much do you want to do what other bikers think you should do?	**Not at all**	1	2	3	4	5	6	7	**Very much**
25.	For me not to brake as I approach the bend would be…	**Easy**	1	2	3	4	5	6	7	**Difficult**
26.	If I wanted to, I could easily not brake as I approach the bend	**Strongly agree**	1	2	3	4	5	6	7	**Strongly disagree**
27.	How much control would you have over not braking as you approach the bend?	**Complete control**	1	2	3	4	5	6	7	**No control**
28.	I would feel in complete control of whether I braked as I approach the bend	**Strongly agree**	1	2	3	4	5	6	7	**Strongly disagree**
29.	It would be entirely up to me whether I braked as I approach the bend	**Strongly agree**	1	2	3	4	5	6	7	**Strongly disagree**
30.	How confident are you that you would be able not to brake as you approach the bend?	**Not very confident**	1	2	3	4	5	6	7	**Very confident**
31.	I ride on rural roads when the weather is fine and dry	**Frequently**	1	2	3	4	5	6	7	**Never**
32.	Riding on a fine and dry day makes my not braking as I approach the bend...	**Less likely**	1	2	3	4	5	6	7	**More likely**
33.	The rural road surfaces I ride on are smooth and even	**Frequently**	1	2	3	4	5	6	7	**Never**
34.	Riding on rural roads that are smooth and even makes my not braking as I approach the bend...	**Less likely**	1	2	3	4	5	6	7	**More likely**
35.	I ride a powerful and reliable motorcycle on rural roads	**Frequently**	1	2	3	4	5	6	7	**Never**
36.	Riding a powerful and reliable motorcycle on rural roads makes my not braking as I approach the bend...	**Less likely**	1	2	3	4	5	6	7	**More likely**
37.	There is little traffic when I ride on rural roads	**Frequently**	1	2	3	4	5	6	7	**Never**
38.	Riding on rural roads with little traffic makes my not braking as I approach the bend...	**Less likely**	1	2	3	4	5	6	7	**More likely**
39.	I have good motorcycle handling skills	**Frequently**	1	2	3	4	5	6	7	**Never**
40.	Having good motorcycle handling skills makes my not braking as I approach the bend...	**Less likely**	1	2	3	4	5	6	7	**More likely**
41.	It would be quite wrong for me not to brake as I approach the bend	**Strongly agree**	1	2	3	4	5	6	7	**Strongly disagree**
42.	I would regret not braking as I approach the bend	**Likely**	1	2	3	4	5	6	7	**Unlikely**
43.	If I had not braked as I approached the bend, I would feel sorry for not doing so	**Likely**	1	2	3	4	5	6	7	**Unlikely**
44.	How often have you not braked as you approached such a bend?	**Never**	1	2	3	4	5	6	7	**Frequently**
45.	In the past I frequently did not brake as I approached such a bend	**Strongly disagree**	1	2	3	4	5	6	7	**Strongly agree**
46.	What is the risk of being involved in an accident if you do not brake as you approach the bend?	**Very low risk**	1	2	3	4	5	6	7	**Very high risk**
47.	What is the risk of being involved in an accident if you do brake as you approach the bend?	**Very low risk**	1	2	3	4	5	6	7	**Very high risk**

You have been out for a few drinks. It is a relatively easy ride home on an **urban road** and so you decide to **ride even though you suspect you may be over the legal limit for alcohol**.

Although we understand that this section may not be relevant to you, we would appreciate your response.

The following questions all relate to <u>riding in these circumstances</u>. Please circle the number which best reflects your response.

48. For me to ride even though I suspect I may be over the legal limit would be….. **(circle one number <u>per line</u>):**

Unsafe	1	2	3	4	5	6	7	**Safe**
Useful	1	2	3	4	5	6	7	**Useless**
Unsatisfying	1	2	3	4	5	6	7	**Satisfying**
Beneficial	1	2	3	4	5	6	7	**Harmful**
Not enjoyable	1	2	3	4	5	6	7	**Enjoyable**
Positive	1	2	3	4	5	6	7	**Negative**
Reckless	1	2	3	4	5	6	7	**Cautious**
Good	1	2	3	4	5	6	7	**Bad**

49. Riding, even though I suspect I may be over the legal limit, would lead to my being caught for drink-riding — **Unlikely** 1 2 3 4 5 6 7 **Likely**

50. Being caught for drink-riding would be... — **Good** 1 2 3 4 5 6 7 **Bad**

51. Riding, even though I suspect I may be over the legal limit, would mean I could get home quickly — **Unlikely** 1 2 3 4 5 6 7 **Likely**

52. Getting home quickly would be... — **Good** 1 2 3 4 5 6 7 **Bad**

53. Riding, even though I suspect I may be over the legal limit, would increase the risk of my being involved in an accident — **Unlikely** 1 2 3 4 5 6 7 **Likely**

54. Being involved in an accident would be... — **Good** 1 2 3 4 5 6 7 **Bad**

55. Riding, even though I suspect I may be over the legal limit, would be more convenient than finding alternative transport — **Unlikely** 1 2 3 4 5 6 7 **Likely**

56. The convenience of riding even thought I suspect I may be over the limit would be... — **Good** 1 2 3 4 5 6 7 **Bad**

57. Riding, even though I suspect I may be over the legal limit, would make me feel exhilarated — **Unlikely** 1 2 3 4 5 6 7 **Likely**

58. Feeling exhilarated would be... — **Good** 1 2 3 4 5 6 7 **Bad**

59. Riding, even though I suspect I may be over the legal limit, would make me feel anxious — **Unlikely** 1 2 3 4 5 6 7 **Likely**

60. Feeling anxious would be... — **Good** 1 2 3 4 5 6 7 **Bad**

61. I would intend to ride, even though I suspect I may be over the legal limit — **Unlikely** 1 2 3 4 5 6 7 **Likely**

62. I would want to ride, even though I suspect I may be over the legal limit — **Strongly disagree** 1 2 3 4 5 6 7 **Strongly agree**

63. I would plan to ride, even though I suspect I may be over the legal limit — **Definitely would not** 1 2 3 4 5 6 7 **Definitely would**

64. The police would disapprove of me riding, even though I suspect I may be over the legal limit — **Strongly agree** 1 2 3 4 5 6 7 **Strongly disagree**

			1	2	3	4	5	6	7	
65.	Other road users would disapprove of me riding, even though I suspect I may be over the legal limit	**Strongly agree**	1	2	3	4	5	6	7	**Strongly disagree**
66.	My family would disapprove of me riding, even though I suspect I may be over the legal limit	**Strongly agree**	1	2	3	4	5	6	7	**Strongly disagree**
67.	Other bikers would disapprove of me riding, even though I suspect I may be over the legal limit	**Strongly agree**	1	2	3	4	5	6	7	**Strongly disagree**
68.	For me to ride, even though I suspect I may be over the legal limit would be…	**Easy**	1	2	3	4	5	6	7	**Difficult**
69.	If I wanted to, I could easily ride, even though I suspect I may be over the legal limit	**Strongly agree**	1	2	3	4	5	6	7	**Strongly disagree**
70.	How much control would you have over riding, even though you suspect you may be over the legal limit?	**Complete control**	1	2	3	4	5	6	7	**No control**
71.	I would feel in complete control of whether I rode, even though I suspect I may be over the legal limit	**Strongly agree**	1	2	3	4	5	6	7	**Strongly disagree**
72.	It would be entirely up to me whether I rode, even though I suspect I may be over the legal limit	**Strongly agree**	1	2	3	4	5	6	7	**Strongly disagree**
73.	How confident are you that you would be able to ride, even though you suspect you may be over the legal limit?	**Not very confident**	1	2	3	4	5	6	7	**Very confident**
74.	The police are around when I ride home after a few drinks	**Frequently**	1	2	3	4	5	6	7	**Never**
75.	The presence of the police makes my riding, even though I suspect I may be over the legal limit...	**Less likely**	1	2	3	4	5	6	7	**More likely**
76.	I drink in places that are a short distance from my home	**Frequently**	1	2	3	4	5	6	7	**Never**
77.	The short distance between where I drink and my home makes riding, even though I suspect I may be over the legal limit...	**Less likely**	1	2	3	4	5	6	7	**More likely**
78.	The road I take home after a few drinks is an 'easy' one	**Frequently**	1	2	3	4	5	6	7	**Never**
79.	The easy road home makes my riding, even though I suspect I may be over the legal limit...	**Less likely**	1	2	3	4	5	6	7	**More likely**
80.	There is little traffic on the road I take home after a few drinks	**Frequently**	1	2	3	4	5	6	7	**Never**
81.	Riding on roads with little traffic makes my riding, even though I suspect I may be over the legal limit...	**Less likely**	1	2	3	4	5	6	7	**More likely**
82.	There are other people about when I make my way home after a few drinks	**Frequently**	1	2	3	4	5	6	7	**Never**
83.	Other people seeing me leave after a few drinks, makes my riding home, even though I suspect I may be over the legal limit...	**Less likely**	1	2	3	4	5	6	7	**More likely**
84.	It would be quite wrong for me to ride even though I suspect I may be over the legal limit	**Strongly agree**	1	2	3	4	5	6	7	**Strongly disagree**
85.	I would regret riding, even though I suspected I may be over the legal limit	**Likely**	1	2	3	4	5	6	7	**Unlikely**
86.	If I had ridden home, even though I suspected I may be over the legal limit, I would feel sorry for doing so	**Likely**	1	2	3	4	5	6	7	**Unlikely**
87.	How often have you ridden, even though you suspected you may be over the legal limit?	**Never**	1	2	3	4	5	6	7	**Frequently**
88.	In the past I have frequently ridden, even though I suspected I may be over the legal limit	**Strongly disagree**	1	2	3	4	5	6	7	**Strongly agree**
89.	What is the risk of being involved in an accident if you ride, even though you suspect you may be over the legal limit?	**Very low risk**	1	2	3	4	5	6	7	**Very high risk**
90.	What is the risk of being involved in an accident if you <u>do not</u> ride when you suspect you may be over the legal limit?	**Very low risk**	1	2	3	4	5	6	7	**Very high risk**

The following questions relate to group riding (i.e. where you leisure ride with other motorcyclists, as part of a group). If you do not take part in group rides please do not complete this section, but go straight to Section C.

Imagine you are riding along a **rural road**. You are riding with a group of other motorcyclists you know. It is a fine, dry day with good visibility and the road is relatively clear. The other motorcyclists in the group start to accelerate, even though the road has a number of bends marked. Because you don't know the road as well as some of the other riders you are forced to **go faster than you feel safe in order to keep up**, relying on their judgement.

The following questions all relate to <u>riding in these circumstances and on this road type.</u> Please circle the number which best reflects your response.

91. For me to ride faster than I feel safe in order to keep up with the group would be….. **(circle one number per line):**

Unsafe	1	2	3	4	5	6	7	**Safe**
Useful	1	2	3	4	5	6	7	**Useless**
Unsatisfying	1	2	3	4	5	6	7	**Satisfying**
Beneficial	1	2	3	4	5	6	7	**Harmful**
Not enjoyable	1	2	3	4	5	6	7	**Enjoyable**
Positive	1	2	3	4	5	6	7	**Negative**
Reckless	1	2	3	4	5	6	7	**Cautious**
Good	1	2	3	4	5	6	7	**Bad**

92. Riding faster than I feel safe, in order to keep up with the group, would cause me to lose control of my motorcycle

    Unlikely 1 2 3 4 5 6 7 **Likely**

93. Losing control of my motorcycle would be...

    Good 1 2 3 4 5 6 7 **Bad**

94. Riding faster than I feel safe, in order to keep up with the group, would increase the risk of my being involved in an accident

    Unlikely 1 2 3 4 5 6 7 **Likely**

95. Being in an accident would be...

    Good 1 2 3 4 5 6 7 **Bad**

96. Riding faster than I feel safe, in order to keep up with the group, would make me feel part of the group

    Unlikely 1 2 3 4 5 6 7 **Likely**

97. Feeling part of the group would be...

    Good 1 2 3 4 5 6 7 **Bad**

98. Riding faster than I feel safe, in order to keep up with the group, would test my riding skills

    Unlikely 1 2 3 4 5 6 7 **Likely**

99. Testing my riding skills would be...

    Good 1 2 3 4 5 6 7 **Bad**

100. Riding faster than I feel safe, in order to keep up with the group, would make me feel exhilarated

    Unlikely 1 2 3 4 5 6 7 **Likely**

101. Feeling exhilarated would be...

    Good 1 2 3 4 5 6 7 **Bad**

102. Riding faster than I feel safe, in order to keep up with the group, would make me feel anxious

    Unlikely 1 2 3 4 5 6 7 **Likely**

103. Feeling anxious would be...

    Good 1 2 3 4 5 6 7 **Bad**

104. I would intend to ride faster than I felt safe, in order to keep up with the group

    Unlikely 1 2 3 4 5 6 7 **Likely**

105. I would want to ride faster than I felt safe, in order to keep up with the group

    Strongly disagree 1 2 3 4 5 6 7 **Strongly agree**

#	Question	Left anchor	1	2	3	4	5	6	7	Right anchor
106.	I would plan to ride faster than I felt safe, in order to keep up with the group	Definitely would not	1	2	3	4	5	6	7	Definitely would
107.	The police would disapprove of me riding faster than I feel safe, in order to keep up with the group	Strongly agree	1	2	3	4	5	6	7	Strongly disagree
108.	Other road users would disapprove of me riding faster than I feel safe, in order to keep up with the group	Strongly agree	1	2	3	4	5	6	7	Strongly disagree
109.	My family would disapprove of me riding faster than I feel safe, in order to keep up with the group	Strongly agree	1	2	3	4	5	6	7	Strongly disagree
110.	Other bikers would disapprove of me riding faster than I feel safe, in order to keep up with the group	Strongly agree	1	2	3	4	5	6	7	Strongly disagree
111.	For me to ride faster than I feel safe, in order to keep up with the group would be…	Easy	1	2	3	4	5	6	7	Difficult
112.	If I wanted to, I could easily ride faster than I feel safe, in order to keep up with the group	Strongly agree	1	2	3	4	5	6	7	Strongly disagree
113.	How much control would you have over riding faster than you feel safe, in order to keep up with the group?	Complete control	1	2	3	4	5	6	7	No control
114.	I would feel in complete control of whether I rode faster than I felt safe, in order to keep up with the group	Strongly agree	1	2	3	4	5	6	7	Strongly disagree
115.	It would be entirely up to me whether I rode faster than I felt safe, in order to keep up with the group	Strongly agree	1	2	3	4	5	6	7	Strongly disagree
116.	How confident are you that you would be able to ride faster than you feel safe, in order to keep up with the group?	Not very confident	1	2	3	4	5	6	7	Very confident
117.	I ride in a group when the weather is fine and dry	Frequently	1	2	3	4	5	6	7	Never
118.	Riding on a fine and dry day makes my riding faster than I feel safe, in order to keep up with the group,...	Less likely	1	2	3	4	5	6	7	More likely
119.	I ride in a group on rural road surfaces that are smooth and even	Frequently	1	2	3	4	5	6	7	Never
120.	Riding on rural roads that are smooth and even makes my riding faster than I feel safe, in order to keep up with the group,...	Less likely	1	2	3	4	5	6	7	More likely
121.	I ride a powerful and reliable motorcycle when I ride in a group	Frequently	1	2	3	4	5	6	7	Never
122.	Riding a powerful and reliable motorcycle makes my riding faster than I feel safe, in order to keep up with the group,...	Less likely	1	2	3	4	5	6	7	More likely
123.	There is little traffic on rural roads when I ride in a group	Frequently	1	2	3	4	5	6	7	Never
124.	Riding on rural roads with little traffic makes my riding faster than I feel safe, in order to keep up with the group,...	Less likely	1	2	3	4	5	6	7	More likely
125.	There are other slow riders in the group I ride with	Frequently	1	2	3	4	5	6	7	Never
126.	Other slow riders in the group make my riding faster than I feel safe, in order to keep up with the group,...	Less likely	1	2	3	4	5	6	7	More likely
127.	It would be quite wrong for me to ride faster than I feel safe, in order to keep up with the group	Strongly agree	1	2	3	4	5	6	7	Strongly disagree
128.	I would regret riding faster than I felt safe, in order to keep up with the group	Likely	1	2	3	4	5	6	7	Unlikely
129.	If I rode faster than I felt safe, in order to keep up with the group, I would feel sorry for doing so	Likely	1	2	3	4	5	6	7	Unlikely
130.	How often have you ridden faster than you felt safe, in order to keep up with the group?	Never	1	2	3	4	5	6	7	Frequently
131.	In the past I have frequently ridden faster than I felt safe, in order to keep up with the group	Strongly disagree	1	2	3	4	5	6	7	Strongly agree
132.	What is the risk of being involved in an accident if you ride faster than you feel safe, in order to keep up with the group?	Very low risk	1	2	3	4	5	6	7	Very high risk

133. What is the risk of being involved in an accident if you <u>do not</u> ride faster than you feel safe, in order to keep up with the group?

Very low risk 1 2 3 4 5 6 7 **Very high risk**

SECTION C: Accidents – this section will help us to identify ways in which accidents involving motorcycles could be reduced

---

1. How many road accidents (including minor spills) have you been involved in while riding a motorcycle on a public road in the last 12 months? *(Tick ONE box)*

None, I have not ridden a motorcycle in the last 12 months	$\square_1$	If 'none', please go to Section D
None	$\square_2$	If 'none', please go to Section D
One	$\square_3$	
Two	$\square_4$	
Three	$\square_5$	
More than three	$\square_6$	

2. In what month and year did your most recent accident(s) occur? (e.g. Dec/2001)

Most recent accident   _ _ _ / _ _ _ _

Next most recent   _ _ _ / _ _ _ _

One before that   _ _ _ / _ _ _ _

3.	We are interested in the types of road accidents you have been involved in while riding a motorcycle on a public road over the last 12 months (including minor spills). Please answer each of the following questions by ticking the appropriate boxes.	Most recent accident	Next most recent	One before that
(a)	What happened first in the accident(s)?			
	(Tick ONE box for EACH accident involved in)			
	Another vehicle hit your motorcycle while it was parked	$\square_1$	$\square_1$	$\square_1$
	Your motorcycle hit a pedestrian	$\square_2$	$\square_2$	$\square_2$
	Your motorcycle hit a cyclist	$\square_3$	$\square_3$	$\square_3$
	Your motorcycle hit the rear or side of another vehicle	$\square_4$	$\square_4$	$\square_4$
	Another vehicle hit the rear or side of your motorcycle	$\square_5$	$\square_5$	$\square_5$
	There was a collision between your motorcycle and another oncoming vehicle	$\square_6$	$\square_6$	$\square_6$
	Your motorcycle hit a roadside object	$\square_7$	$\square_7$	$\square_7$
	Your motorcycle left the road without hitting any other object	$\square_8$	$\square_8$	$\square_8$
	The accident was a minor spill	$\square_9$	$\square_9$	$\square_9$
	The accident was a low speed manoeuvring accident	$\square_{10}$	$\square_{10}$	$\square_{10}$
	Other (please specify_____)	$\square_{11}$	$\square_{11}$	$\square_{11}$
(b)	On what type of road did the accident(s) occur?			
	(Tick ONE box for EACH accident involved in)			
	On a road in a built-up area	$\square_1$	$\square_1$	$\square_1$
	On a country/rural road	$\square_2$	$\square_2$	$\square_2$
	On dual carriageway with a 70mph speed limit	$\square_3$	$\square_3$	$\square_3$
(c)	What were the conditions like at the time of the accident(s)?			
	(Tick ONE box for EACH accident involved in)			
	Fine and dry	$\square_1$	$\square_1$	$\square_1$
	Rain or wet roads	$\square_2$	$\square_2$	$\square_2$
	Snow or ice	$\square_3$	$\square_3$	$\square_3$
	Fog	$\square_4$	$\square_4$	$\square_4$
(d)	What were the road conditions like at the time of the accident(s)?			
	No diesel on the road	$\square_1$	$\square_1$	$\square_1$
	Diesel on the road	$\square_2$	$\square_2$	$\square_2$
(e)	What injuries did YOU sustain as a result of the accident(s)?			
	(Tick ONE box for EACH accident involved in)			
	None	$\square_1$	$\square_1$	$\square_1$
	Slight injuries (e.g. cuts and bruises)	$\square_2$	$\square_2$	$\square_2$
	Serious injuries (e.g. needing hospital care)	$\square_3$	$\square_3$	$\square_3$
(f)	What injuries did other people sustain as a result of the accident(s)?			
	(Tick ONE box for EACH accident involved in)			
	None	$\square_1$	$\square_1$	$\square_1$
	Slight injuries (e.g. cuts and bruises)	$\square_2$	$\square_2$	$\square_2$

		Most recent accident	Next most recent	One before that
	Serious injuries (e.g. needing hospital care)	□3	□3	□3
	Fatal injuries	□4	□4	□4

(g)	What damage was done to the motorbike you were riding?			
	(Tick ONE box for EACH accident involved in)			
	None	□1	□1	□1
	Slight damage (e.g. dents and scratches)	□2	□2	□2
	Serious damage	□3	□3	□3

(h)	What damage was done to other vehicles?			
	(Tick ONE box for EACH accident involved in)			
	None	□1	□1	□1
	Slight damage (e.g. dents and scratches)	□2	□2	□2
	Serious damage	□3	□3	□3

(i)	What was the purpose of your journey?			
	(Tick one box for EACH accident)			
	I was riding for pleasure purposes	□1	□1	□1
	I was commuting to/from work	□2	□2	□2
	I was riding during the course of my work	□3	□3	□3
	Other (please specify _____)	□4	□4	□4

(j)	What type of motorcycle were you riding when the accident(s) happened?			
	(Tick ONE box for EACH accident involved in)			
	Supersport motorcycle	□1	□1	□1
	Sport/Touring motorcycle	□2	□2	□2
	Moped	□3	□3	□3
	Custom motorcycle	□4	□4	□4
	Traditional motorcycle	□5	□5	□5
	Enduro/track motorcycle	□6	□6	□6
	Touring motorcycle	□7	□7	□7
	Scooter	□8	□8	□8
	Other (please specify _____)	□9	□9	□9

(k)	Did the accident(s) occur during:			
	(Tick ONE box for EACH accident involved in)			
	Daylight	□1	□1	□1
	Dawn or dusk	□2	□2	□2
	Hours of darkness	□3	□3	□3

(l)	To what extent do you think you were to blame for the accident(s)?			
	Not at all	□1	□1	□1
	A little	□2	□2	□2
	Quite a lot	□3	□3	□3
	Entirely	□4	□4	□4

(m)	If you would like to give us any further details of the accident(s), please do so in the box below

4.	Many riders have had the impression of only just avoiding an accident (i.e. of having a near miss). How many times has this happened to you in the last 12 months while riding a motorcycle on a public road?	
	(Tick ONE box)	
	Never	□1
	On 1 or 2 occasions	□2
	On 3 to 5 occasions	□3
	On 6 to 10 occasions	□4
	On more than 10 occasions	□5

SECTION D: Attitudes to life – this section will help us to identify your general attitudes to life

---

Below there are phrases describing a variety of behaviours. Please use the rating scale opposite each phrase to describe how accurately each statement describes **you**. Whilst these questions may seem irrelevant to motorcycling, they provide us with an overview of your 'attitudes to life' in general.

Please read each statement carefully, and then circle the appropriate response that describes you.

		Describes me very well	Describes me somewhat	Does not describe me very well	Does not describe me at all
1.	I can see how it would be interesting to marry someone from a foreign country	1	2	3	4
2.	When the water is very cold, I prefer not to swim even if it is a hot day	1	2	3	4
3.	If I have to wait in a long queue, I'm usually patient about it	1	2	3	4
4.	When I listen to music, I like it to be loud	1	2	3	4
5.	When taking a trip, I think it is best to make as few plans as possible and just take it as it comes	1	2	3	4
6.	I stay away from films that are said to be frightening or full of suspense	1	2	3	4
7.	I think it's fun and exciting to perform or speak before a group	1	2	3	4
8.	If I were to go to an amusement park, I would prefer to ride the roller coaster or other fast rides	1	2	3	4
9.	I would like to travel to places that are strange and far away	1	2	3	4
10.	I would never like to gamble with money, even if I could afford it	1	2	3	4
11.	I would have enjoyed being one of the first explorers of an unknown land	1	2	3	4
12.	I like films where there are a lot of explosions and car chases	1	2	3	4
13.	I don't like extremely hot and spicy foods	1	2	3	4
14.	In general, I work better when I'm under pressure	1	2	3	4
15.	I often like to have the radio or TV on while I'm doing something else, such as reading or doing the housework	1	2	3	4
16.	It would be interesting to see a car accident happen	1	2	3	4
17.	I think it's best to order something familiar when eating in a restaurant	1	2	3	4
18.	I like the feeling of standing next to the edge on a high place and looking down	1	2	3	4
19.	If it were possible to visit another planet or the moon for free, I would be among the first to sign up	1	2	3	4
20.	I can see how it must be exciting to be in a battle during a war	1	2	3	4

APPENDIX 3 – MOTORCYCLING DBQ BEHAVIOURS AND ACCIDENT INVOLVEMENT

Behaviour	N		Mean		T statistic	P value
	Non. acc.inv	acc. inv.	Non. acc.inv.	acc. inv.		
When riding, queuing, you pay close attention to main traffic and nearly hit vehicle in front	8039	965	1.41	1.47	-2.34	.020
Fail to notice pedestrians crossing, when turning into side street	8038	964	1.39	1.39	-0.03	.976
Exceed speed limit on residential road	8018	962	2.55	2.71	-3.89	.000
Miss 'Give Way' signs, narrowly avoid colliding with right of way traffic	8035	965	1.20	1.20	-0.23	.822
Attempt to overtake someone you hadn't notice signalling right	8030	965	1.36	1.44	-3.96	.000
Race away from lights with intention of beating driver next to you	8034	964	2.02	2.29	-6.31	.000
Ride close to vehicle in front so it would be difficult to stop in emergency	8040	966	1.50	1.70	-6.84	.000
Exceed speed limit on motorway	7906	954	2.77	3.03	-5.05	.000
Ride between two lanes of fast moving traffic	8009	962	1.63	1.87	-6.07	.000
Ride so fast into corner that you scare yourself	8025	965	1.81	1.91	-3.77	.000
Exceed speed limit on country/rural road	7998	962	2.83	2.96	-2.80	.000
Ride when you suspect you're over legal limit for alcohol	8022	926	1.05	1.07	-1.70	.089
Riding at same speed as traffic, difficult to stop in time at traffic light which has turned	8043	966	1.49	1.52	-1.60	.110
Distracted you belatedly realise that the vehicle in front has slowed and you brake hard to avoid a collision	8038	967	1.74	1.82	-3.59	.000
Pull out on main road in front of vehicle you hadn't noticed or misjudged his speed	8037	967	1.44	1.46	-1.17	.240
Disregard speed limit late at night or early hours of morning	7993	954	2.25	2.54	-6.66	.000
Not notice pedestrian waiting at zebra crossing, or pelican crossing turned red	8034	966	1.37	1.45	-3.55	.000
Not notice someone stepping out behind parked vehicle, until nearly too late	8034	966	1.56	1.62	-2.80	.005
Fail to notice or anticipate another vehicle pull out and have difficulty stopping	8011	964	1.66	1.77	-4.60	.000
Get involved in unofficial 'races' with other riders/drivers	8007	967	1.36	1.50	-5.06	.000
Attempt to do, or actually do, a wheelie	8032	967	1.22	1.30	-3.05	.002
Unintentionally do a wheel spin	8022	964	1.28	1.32	-1.76	.080
Intentionally do a wheel spin	8009	963	1.11	1.17	-3.06	.002
Pull away too quickly and front wheel comes off the road	8028	967	1.35	1.43	-3.14	.002
Open up throttle and 'go for it' on country roads	8013	963	1.88	2.06	-4.47	.000
Driver deliberately annoys you or puts you at risk	7998	962	2.48	2.72	-6.36	.000
Ride so fast into a corner you might lose control	8055	970	1.73	1.82	-3.81	.000
Change gear when going round a corner	7997	958	1.84	1.91	-2.06	.039
Skid on a wet road or manhole cover	8051	970	2.25	2.48	-7.27	.000
Run wide when going round a corner	8047	965	1.93	2.05	-4.86	.000
Find you have difficulty controlling the bike at speed	8044	965	1.33	1.38	-2.79	.005
Brake or throttle back when going round a bend	8047	967	2.17	2.24	-1.94	.053