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Passion, performance, practicality: motorcyclists' motivations and attitudes to safety – motorcycle safety research project

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Transport Research Laboratory

PUBLISHED PROJECT REPORT PPR442

Passion, performance, practicality: motorcyclists' motivations and attitudes to safety

Motorcycle safety research project

by S Christmas, D Young, R Cookson and R Cuerden (TRL)

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Client: **Department for Transport, Road User Safety**
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Executive summary

From the mid 1990s, motorcycling became increasingly popular in Great Britain, with motorcycle traffic increasing by approximately 50% between 1996 and 2003, although this has levelled off between 2004 and 2006, increasing slightly in 2007. Comparing different road users' accident rates by kilometre travelled highlights that motorcyclists are at a much greater risk of being killed or seriously injured (KSI), more than 50 times that for car drivers.

Motorcyclists constituted 20% of all road traffic deaths in Great Britain in 2006 and, as a result, motorcycle safety is one of the key areas of concern of the Department for Transport and others responsible for road safety.

This study was commissioned to provide a better understanding of the needs, motivations and perspectives of motorcyclists with respect to road safety. Specifically the research programme set out:

'To gain an understanding of motorcyclists' attitudes to safety and the reasons behind the decisions that impact on their safety.'

Achieving this aim required three core questions to be addressed:

- how do motorcyclists make decisions about issues that impact on their safety?
- how do these decision making strategies which motorcyclists use relate to the actual risk associated with their choice? and
- what are the opportunities which would influence the decision making process of motorcyclists in a positive way?

Specifically, for different groups of riders, such as leisure, functional and professional riders, the project explored:

- how riders choose their bikes;
- how riders choose their protective clothing and helmets (including knowledge of and attitudes to SHARP);
- how riders plan/prepare for their journeys;
- whether rider fatigue is perceived as an issue and if so in what circumstances;
- what riders feel are contributors and countermeasures to rider fatigue; and
- where riders get their safety information from (websites, magazines, peers etc).

The work was a collaborative effort between SHM (who were responsible for the qualitative work), Future Featuring Ltd (who undertook quantitative study design and interpretation) and GFK (who carried out the quantitative surveys), with TRL providing technical background material and training for interviewers so that the research team could talk more knowledgeably to motorcyclists. TRL also acted as overall project coordinator.

The project comprised both qualitative and quantitative components. The qualitative phase was designed to yield an understanding of the motivations behind the decisions that have an impact on riders' safety. The insights gained in this phase were then used to design and interpret a quantitative study, using structured questionnaires, which helped give definition to the various user and attitudinal groups.

The primary function of the qualitative component was to develop questions testing the motivation of riders, which were subsequently used as the basis of the segmentation exercise. Thematic analysis of riders' descriptions of 'ideal rides' delivered a bank of thirty descriptions of 'things that riders get out of riding a motorcycle, scooter or moped', couched in the language used by riders themselves. The second function of the

qualitative work in the research design was to provide an evidence base for the interpretation of statistical analysis of quantitative results.

A total sample of 1,019 riders was recruited and interviewed for the quantitative component and this forms the basis of the core of the report's findings. The quantitative section of the report outlines their characteristics and provides insight through analysis of their responses to questions regarding choices of bike, helmets, gear and their experiences of fatigue whilst riding.

Thirty 'motivations to ride' statements from the questionnaire were categorised into eight groups using a statistical technique that examined correlations between the statements. The qualitative evidence was critical in the selection of factors and segmentation solutions, and in the interpretation of segment profiles. The critical test here was whether constructs that made mathematical sense also made sense as a way of describing and differentiating the riders who had been engaged directly, and the many things they had said about their motivations and perceptions of risk.

There were 1,019 respondents, and 999 were allocated to a seven segment solution. The seven segments were described as:

- Riding hobbyists (segment 1). These are older, summer-only riders who enjoy the social interaction with other riders almost as much as the riding itself – and who like to look the part.
- Performance disciples (segment 2). These are committed, all-year riders with a total focus on high performance riding – and a strong dislike for anything that gets in the way of it.
- Performance hobbyists (segment 3). These are solitary, summer-only riders, for whom riding is all about individual experiences and sensations – and who are not concerned about what other riders are doing.
- Look-at-me enthusiasts (segment 4). These are young (or never-grew-up) riders with limited experience but limitless enthusiasm, for whom riding is all about self-expression and looking cool.
- Riding disciples (segment 5). These are passionate riders for whom riding is a way of life, built on a strong relationship with the bike itself and membership of the wider fraternity of riders.
- Car aspirants (segment 6). These are young people looking forward to getting their first car when age/finances allow – but for the time being just happy to have got their own wheels.
- Car rejecters (segment 7). These are escapees (a higher proportion of women than in any other segment) from traffic jams, parking tickets, fuel costs and other problems of car use – who don't care for motorcycles, but do care for low-cost mobility.

The different segments' demographics, attitudes and perceptions of risk are highlighted. A conceptual model was developed for the seven segments and the riders' **passion** for motorcycling and their relationship to **performance** were measured. This process was used to describe and quantify their riding behaviour.

It was recognised that a seven segment solution may prove unwieldy and difficult to use. However, it does reflect the real diversity of riders, and through the construction and explanation of the relationship between the segments, it is possible to link them where appropriate, to form larger groups depending on the application (policy development, communications etc).

Scores for accident propensity were calculated and some clear patterns were identified:

- On either measure (accidents-per-year or accidents-per-mile), Riding Disciples and Riding Hobbyists have a relatively low accident propensity. Both have mean accident propensity scores significantly lower than the overall mean.
- Performance Disciples have a higher accident propensity, although in part this is because of a higher annual mileage.
- At the other end of the spectrum, Car Aspirants and Look-at-me Enthusiasts have the highest accident propensity on either measure. Both have mean accident propensity scores significantly higher than the overall mean.
- While not as risky, Car Rejecters and Performance Hobbyists also have somewhat higher accident propensities – although lower annual mileages mean they may not have accidents as often as Performance Disciples

This research has concentrated on the riders' motivations and **risk perception**, and self reported decisions with respect to **choice of bike, helmet, safety gear** and avoiding **fatigue**.

With respect to rider motivation and risk perception associated with the **choice of bike,** Car Aspirants, Car Rejecters and Riding Hobbyists are the segments most open to considering safety features in their selection of a bike.

The real challenge in promoting **safer helmets and gear** is not to sell the importance of safety, but to influence perceptions of what is safe enough. Car Aspirants pose particular challenges in respect of their judgements of what is safe enough, not least because they are a transitory riding population with limited budgets and, we believe, a tendency not to think about the risks of riding.

Look-at-me Enthusiasts, which represent nearly a quarter of the riding population, create unique challenges for the promotion of any safety messages. Although they do place great importance on safety in the selection of a helmet and safety gear, it is striking that looks rank highly in both choices as well. The particular risk attitudes apparent in Look-at-me Enthusiasts also might lead to concern about whether they set the bar high enough when deciding what is safe enough: they remain the segment least likely to hesitate about riding in jeans and a T-shirt. An approach to the promotion of safety which is not purely factual and utilitarian but instead taps into the motivations and interests of this group may help break through to this critical segment of riders.

The project identified **fatigue** as an issue facing Performance Disciples, who are more likely to experience both fatigue by and fatigue before riding. Also affected are Performance Hobbyists and Look-at-me Enthusiasts, both of which appear to mirror the patterns of fatiguing behaviour found in Performance Disciples but in a less extreme (and therefore not statistically significant with respect to the mean) way. (With regard to riding after too many drinks the night before, Look-at-me Enthusiasts set the extreme and the other two segments follow close behind). When combined, these three segments account for 14 of the 18 reported accidents or near accidents due to fatigue.

The debate about whether using strong coffee or caffeine drinks to wake up is a good idea or not seems currently to be a debate between those who need to use such stimulants and those who don't. Given the relationship between fatigue and segments with a high interest in performance, the best way to disseminate best practices in fatigue management is almost certainly through training-based routes, which emphasise enhancing personal performance as much as increased safety.

The project has delivered a significant dataset, which has been interrogated successfully to describe motorcycle riders' characteristics, attitudes and self reported decisions with respect to choice of **bike**, **helmet** and **safety gear**, and avoiding **fatigue**. The dataset contains significant amounts of other information which is available to future research projects if required.

1 Introduction

1.1 Background: Why Motorcyclists?

From the mid 1990s, motorcycling became increasingly popular in Great Britain, with motorcycle traffic increasing by approximately 50% between 1996 and 2003, although this has levelled off in more recent years (Figure 1).

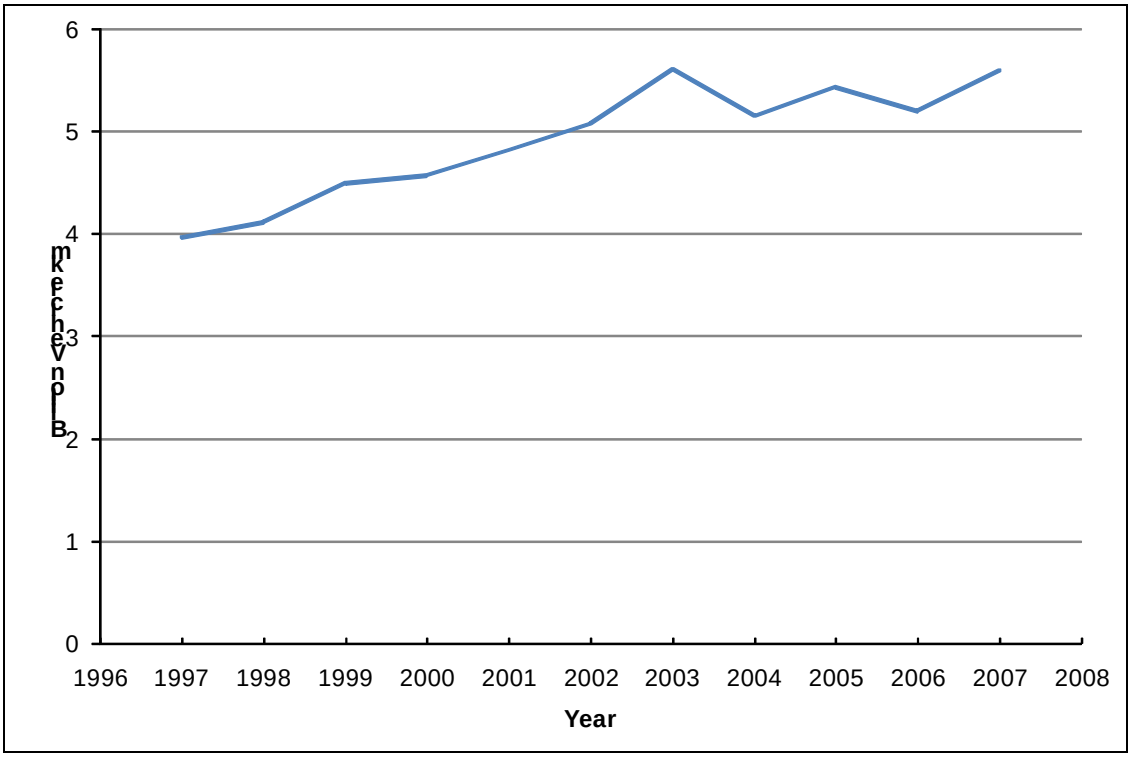


Figure 1 – Motorcycle traffic in Great Britain from 1996-2007 (Department for Transport, 2008)

The Government has recognised this increase and, in response, the Department for Transport (DfT) has issued a *Motorcycling Strategy* (http://www.dft.gov.uk/pgr/roads/vehicles/motorcycling/overnmentsmotorcyclingst4550.pdf). This states, *inter alia*:

"Motorcycling is becoming increasingly popular. Some people are using motorbikes to beat congestion, others for leisure activity. We recognise this choice and believe that motorcycling has a role to play within the transport system. The theme of this strategy therefore is to facilitate motorcycling as a choice of travel within a safe and sustainable transport framework."

"Our aim is to make motorcycling a safe, enjoyable experience for those who choose this mode. This means taking account of the needs of motorcyclists, promoting safety measures and mainstreaming motorcycling, so that its needs are considered as fully as any other transport mode, in the development of transport policy."

However, comparing different road users' accident rates by kilometre travelled highlights that motorcyclists are at a much greater risk of serious injury (Department for Transport, 2008). Figure 2 shows how the relative risk of being killed or seriously injured (KSI) per kilometre travelled is more than twice that for pedal cycles (the next highest group) and more than 50 times that for car drivers.

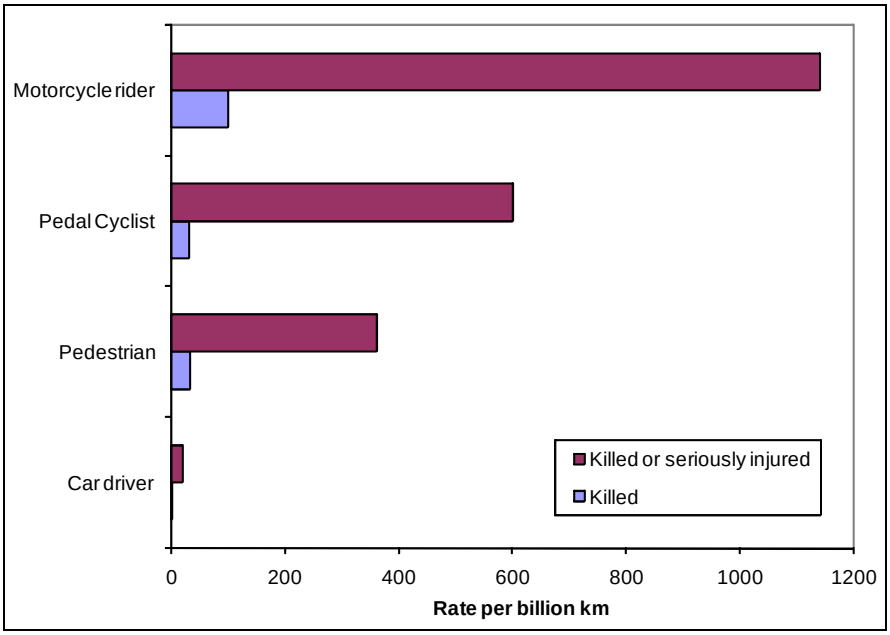


Figure 2 - Rate of accidents by vehicle type per billion km (Department for Transport, 2008)

Motorcyclists constituted 20% of all road traffic deaths in 2006 (Department for Transport, 2007) and, as a result, motorcycle safety is one of the key areas of concern of the DfT and others responsible for road safety.

1.2 The Policy Dimension

The current study was commissioned to provide a better understanding of the needs, motivations and perspectives of motorcyclists themselves with respect to road safety. However, it must be borne in mind that this research programme was designed to address only part of the overall safety problem.

First, the current study looks only at riders and not at the many other factors which contribute to high accident statistics, most obviously the behaviour of other road users. There is no presumption in this that motorcyclists are 'to blame' for the high rate of casualties. Indeed, some studies have shown that other vehicle drivers are more often to blame than motorcyclists. For example, the Association des Contructeurs Européens de Motocycles (ACEM) investigated 921 accidents in detail from five sampling areas (France, Germany, the Netherlands, Spain and Italy) (ACEM 2004a). The Motorcycle Accident In-Depth Study (MAIDS) report (ACEM, 2004b) found the main primary contributory factors were the Powered Two Wheeler (PTW) riders (37.1%) and the other vehicle driver (50.4%) as can be seen in Table 1.

Table 1 - Prime causes of accidents involving motorcycles (ACEM, 2004b)

	Frequency	Percent
Human – PTW driver	341	37.1
Human – Other Vehicle driver	464	50.4
Vehicle	6	0.7
Environmental	72	7.7
Other Failure	37	4.1
Total	921	100.0

Excess speed of the motorcycle was only found to be related to accident causation in relatively few cases, as travelling and impact speeds were found to be low, often below 50kph. The cause of most of the motorcycling accidents was found to be human error. Most frequently, the human error was failure by motorists to see the motorcycle in the traffic environment due to lack of driver attention, temporary view obstructions or the low conspicuity of the motorcycle. In our survey, motorcyclists themselves recognised the importance of these factors, with 41% selecting "Behaviour of other non-motorcycle road users" as the main reason for the greater fatality rate among motorcyclists, and 24% selecting "Motorcycles not being seen by other road users (visibility)". (The next most popular answer, "Irresponsible riding", was selected by 18% of the sample.)

The DfT have commissioned work in this area (McCarthy et al, 2007) and have incorporated these issues within the *Motorcycling Strategy*. Specifically, the department state:

"… we have given a greater focus in the driving test to the requirement for drivers to recognize the need to look out for motorcyclists, and will monitor and review the need for further refinements".

Secondly, the study is focused on a number of key issues relating to the ways in which riders can make themselves less vulnerable on the road. There is no presumption that tackling choice of helmet, gear and bike, and avoiding fatigue are the best ways to reduce casualties. Good gear may save a rider's life in an accident, but it would obviously be preferable to prevent the accident in the first place.

The issues do, however, reflect a number of current policy initiatives. Again quoting from the *Motorcycling Strategy*:

"Action (xvii): we support collaborative initiatives by user groups, trainers and retailers promoting the correct fitting of helmets and encourage them to develop these for all sellers of motorcycles and rider safety equipment. We will encourage new initiatives by trainers and motorcycle retailers to raise awareness on the importance of the right clothing to reduce the seriousness of injury and improve conspicuity."

Motorcycle helmets are known to be very effective at mitigating serious injury. Encouragingly, a survey carried out by the DfT (Clarke et al., 2004) found 79% of respondents wore 'approved' type A helmets, which are those which offer the most protection in an accident. However, over 80% of motorcycling fatalities receive a strike to the head and in 80% of these cases the head injury is the most severe injury sustained (Chinn, et al., 2001). The DfT therefore invested in specific research into a better understanding of how a helmet can offer greater protection (Halewood, 2008). The DfT believe that providing clear and objective advice so that the consumer can make an informed choice will promote an overall greater level of protection for powered two wheeler users by encouraging helmet manufacturers to improve the safety protection levels of their products. The DfT launched the Safety Helmet Assessment Rating Programme (SHARP) in November 2007. SHARP is a helmet rating scheme that was introduced into the marketplace in June 2008 with ratings for the most popular current motorcycling helmets.

In the case of fatigue, the issue was also included in the *Motorcycling Strategy* in response to requests from motorcyclists themselves. Fatigue is an important issue in all areas of road user safety and was identified as an area which required thought in this project, not least because of the current paucity of evidence with respect to riders. When referring to fatigue it is important to distinguish between the different types. Definitions of the types of fatigue as given by Horberry et al (2007) are as follows:

- Fatigue - An umbrella term covering internal states and performance decrements associated with a need for sleep, tasks/environments that are mentally or physically demanding, and tasks/environments that are insufficiently stimulating. Fatigue may involve subjective states of sleepiness/drowsiness,

weariness/exhaustion or boredom. However, performance decrements caused by fatigue are not necessarily accompanied by such subjective states.

- Sleepiness/drowsiness - A propensity to fall asleep, have microsleeps or make related task errors, caused by a need for sleep/lack of sleep, circadian effects, a sleep disorder or other medical condition, or drugs/medicines; and possibly permitted or exacerbated by a low level of task or environmental stimulation. There will generally be a subjective state of sleepiness or drowsiness, but the driver/rider will not necessarily be aware of how close they are to falling asleep, and task errors may occur before the subjective state becomes apparent.
- Excessive task demand (ETD) - A propensity for reduced performance caused by continued mental or physical effort at a demanding or prolonged task, or in an uncomfortable or hostile environment. This may be accompanied by a subjective state of exhaustion, weariness or physical discomfort, but performance decrements may occur before such states become apparent.

Rider fatigue was found by Horberry et al (2007) to be an area in which there has been very little research in the past. However, it was found that some of the causes of rider fatigue are shared with those of driver fatigue and fatigue in general. It should be borne in mind that motorcycle riding tasks make different demands of people compared to car driving tasks, with riders being exposed to a much more hostile environment than car drivers. This has important consequences for the way fatigue develops and affects motorcyclists. This review also shows that, in a questionnaire study, riders commonly reported insufficient breaks, long riding hours and monotonous roads as possible causes of rider fatigue. However, it also states that fatigue can be caused by stress from heat, cold, noise, vibration or posture/discomfort as well as night-time riding.

Horberry et al also declare that few countermeasures or campaign strategies with a firm scientific basis have been developed specifically to help riders to avoid riding when fatigued, or to combat the effects of fatigue on riders. Measures suggested specifically for minimising rider fatigue focus on reducing the physical and mental demands of the (riding) task and include: having a windshield on the motorbike; correct configuration of the motorcycle; and using hearing protection.

Analysis of accident databases discussed in Horberry et al identified fatigue as a factor in only a small proportion of motorcycle accidents, which meant that it was not possible to draw conclusions about any associations with other factors. This low number is reported to be due, at least in part, to the difficulty of gathering information about the fatigue state of the rider either at the scene or retrospectively.

Moreover, although only part of a solution, these are things over which a rider has complete control (unlike, say, the behaviour of other road users).

From a road safety point of view, helping riders to make themselves less vulnerable on the road has to be an important part of an overall strategy to reduce serious and fatal motorcycling accidents, alongside measures to change the behaviour of other road users, improve the skills of riders, and so forth.

1.3 The current project

From a technical research point of view, matters over which the rider has complete control, such as the type of bike purchased, the helmet and clothing worn and the rider's mental state before and during riding provide a good opportunity to understand whether there are connections between motivations to ride and safety needs. Accordingly, the objective of the research was:

'To gain an understanding of motorcyclists' attitudes to safety and the reasons behind the decisions that impact on their safety.'

Achieving this objective required us to address three core aims:

- understand how motorcyclists make decisions about issues that impact on their safety;
- determine how the decision making strategies which motorcyclists use relate to the actual risk associated with their choice; and
- identify opportunities to influence the decision making process of motorcyclists in a positive way.

Specifically, for different groups of riders, such as leisure, functional and professional, the project explored:

- how riders choose their bikes;
- how riders choose their protective clothing and helmets (including knowledge of and attitudes to SHARP);
- how riders plan/prepare for their journeys;
- whether rider fatigue is perceived as an issue and if so in what circumstances;
- what riders feel are contributors and countermeasures to rider fatigue; and
- where riders get their safety information from (websites, magazines, peers etc).

The project comprised both qualitative and quantitative components. The qualitative phase was designed to yield an understanding of the motivations behind the decisions that have an impact on riders' safety. The insights gained in this phase were then validated by a quantitative study, using structured questionnaires, which helped give definition to the various user and attitudinal groups.

The work was a collaborative effort between SHM (who were responsible for the qualitative work), Future Featuring Ltd (who undertook quantitative study design and interpretation) and GFK (who actually carried out the quantitative surveys), with TRL providing technical background material and training for interviewers so that they could talk more knowledgeably to motorcyclists. TRL also acted as overall project coordinator.

The findings can be used to inform the dissemination of information on rider fatigue, on new technologies such as ABS, on protective clothing, and on the marketing of SHARP. It can also provide key insights to policy and enforcement stakeholders.

1.4 Motivation and segmentation

Riding a motorcycle remains a minority activity in the UK: there are nearly 23 times as many cars on the road as motorcycles, scooters or mopeds, compared to only 8 times as many in Germany and just under 5 times as many in Spain. For most of those who do ride, the choice is an active one (compared to what has become, for much of the population, the 'default option' of driving a car). The choice is made, moreover, with full awareness of the greater objective risks faced by riders on UK roads. Research undertaken in Scotland, for instance, found that most riders were aware of, or willing to believe, objective estimates of motorcycling risk, and that they did not base their behaviour on grossly under-estimating the risks of motorcycling as an activity. So – a non-rider might well ask – why *do* they do it?

"Most people ask the question, why would you want to go out on a bike on modern day roads and things like that? Well, you have to make that decision." [M, 30, 1000cc]

Riders reading this report will probably be ready with an answer to the question that 'most people' ask. Participants in our qualitative interviews and workshops certainly were:

One day the bus just didn't turn up and it was taking me longer and longer to get home because I moved from working in Leeds to working in Bradford. [M, 53, 125cc]

Freedom, being on your own, no distractions – no radio, no CD's, no phone, no nothing – not even an alarm system to distract me. [M, 55, 1050cc]

It's just a way of getting the cobwebs out of your system, if you like, from the day in the office. [M, 40, 600cc]

It's more of a sense of freedom, being out there and doing it and seeing it, rather than being in a car. [F, 25, 600cc]

It's just the adrenaline rush. It's the same whether you're a sky diver, parachutist skier, you want that adrenaline. There is a little bit of fear but there shouldn't be a lot of fear. [M, 39, 750cc]

I wouldn't ride on a proper banged up bike. I got a Vesper, that retro look, so it's cool. [F, 18, 125cc]

We have a camaraderie that car drivers can't even think about, because car drivers, all they do is shout at each other and flick fingers up at each other all the time. [M, 44, 1000cc]

The best thing is getting from point A to B in a short period of time, considering that I do take a lot care, and being very cautious when I drive. [M, 45, 125cc]

I think it's unnatural to be on a bike at an angle, and the thrill is being over at an angle. [M, 48, 1000cc]

I've done that in work recently where you do a role profile or a person profile and you have obviously got the wife and kids, and… It's definitely part of you, the bike. [M, 35, 1000cc]

The selection of responses above illustrates a point that has been noted by previous researchers: riders have very different motivations for riding. (For a summary of previous research on rider motivations, see Section 5.4 of Motorcycle safety: A scoping study (Elliot et al, 2003). These differences in motivation lie at the heart of this research study.

It is worth noting that many riders are themselves quick to point out these differences in motivations. The riding population, one might say, is self-segmenting. Unfortunately, one reason why some riders are conscious of differing motivations is that they feel they are too often stereotyped by non-riders in ways that show a lack of understanding of, or respect for the diversity of, rider motivations.

"I always feel that every time I have a conversation with someone about bikes who doesn't know anything about bikes they steer it towards how fast you go and how quickly you can get from nought to 60." [M, 50, 1100cc]

"I think the difference in perception is, if people see a young lad in a car with his baseball cap on the wrong way and his big loud exhausts and stereo blaring, wheel spinning away from the lights, they think he is an idiot. He's an idiot, because they all drive cars and they know all car drivers aren't idiots. If they see a biker popping a wheelie down the high street, they think all bikers are idiots, because they don't all ride bikes. The general public doesn't ride bikes. That's the problem." [M, 45, 600cc]

Undertaking a segmentation exercise as a way to avoid stereotyping is a strategy fraught with problems. One could argue that segmentation is just stereotyping in statistical garb. We recognise that some riders may take exception to our efforts in this report to offer an evidence-based segmentation of the riding universe, just as the first of

the riders quoted above was expressing concerns that the researcher was trying to steer the conversation in just the way he was describing. We are aware of this here: so – a non-researcher might well ask – why *are* we doing it?

The answer, put very simply, is this: a division of the riding universe into seven evidence-based motivational 'stereotypes' (or 'segments', as we will refer to them) is an imperfect simplification of the real world, but it is a considerably better simplification than a single, anecdotally based stereotype of those who ride. In order to frame and implement policies that will work for riders, policy-makers need some way of getting a handle on what riding and its associated risks mean to them. Moreover, the bewildering diversity of outlooks expressed in the quotations at the beginning of this section should stand as a reminder that this is as true for policy-makers who are riders as it is for those who are non-riders, since riders must overcome the additional risk of assuming that their own outlook is that shared by riders in general.

2 Methodology

The work programme was designed to encompass three sequential phases, which were managed by TRL:

Phase 1 of the project aimed to identify the scope of the problem associated with the accident risk of different motorcycle rider groups and the overall characteristics of these riders. This phase consisted of literature reviews, accident data analysis and exploratory interviews with key professionals and the public.

Qualitative research was carried out in phase 2 of the project where workshops were held involving the same members of the public as were interviewed in phase 1.

In phase 3, the findings of phases 1 and 2 were quantified. A questionnaire survey was designed and undertaken to capture the motorcyclists' responses. Analysis of this data was then performed to measure the causal contexts, behaviours and motivations regarding motorcycling.

2.1 Qualitative phase

2.1.1 Role of the qualitative work in the research design

2.1.1.1 Evidence base for survey design

Evidence from direct engagement with a wide diversity of riders was important in framing both the content and language of a number of items in the questionnaire, including factors in purchase decisions and (given the lack of existing research) fatigue-related scenarios in which a rider might 'think twice' about riding.

The most important design implication, however, was for questions testing the motivation of riders, which were subsequently used as the basis of the segmentation exercise. Thematic analysis of riders' descriptions of 'ideal rides' delivered a bank of thirty descriptions of 'things that riders get out of riding a motorcycle/scooter/moped', couched in the language used by riders themselves.

In creating this list of statements, we resisted the temptation to reduce the number of motivational statements by combining ones that seemed similar *to us*, or to 'rationalise' the list by the application of pre-existing frameworks or motivational theories. The aim here was not to test any existing framework, but to look for one in the real motivations of riders. Essentially, the approach allowed us to combine, in a crucial research question, the benefits of an open-field question (unconstrained responses from respondents) with the analytical merits of a closed-field question (readily comparable responses across participants).

Overall, it is important to stress that the qualitative phase of work was NOT used to develop hypotheses for quantitative testing. Instead, analysis of interviews and workshops was used to tease out potential points of differentiation (and appropriate ways of expressing them) which could be explored further in the questionnaire. For example, a question about riders' level of passion for riding was included in response to riders' clear tendency to 'self-segment' on this basis. This question, which was not used in the segmentation analysis, did prove fundamental in understanding the results (see 3.2.2).

2.1.1.2 Evidence base for data analysis

The second function of the qualitative work in the research design was to provide an evidence base for the interpretation of statistical analysis of quantitative results.

In particular, qualitative evidence was critical in the selection of factor and segmentation solutions, and in the interpretation of segment profiles. The critical test here was whether constructs that made mathematical sense also made sense as a way of describing and differentiating the riders we had engaged directly, and the many things they had said about their motivations and perceptions of risk.

2.1.2 Sample and approach

A total of 66 riders took part in the qualitative phase of work, recruited to ensure diversity across a number of key variables:

- Age
- Some representation of women
- Bike size
- Riding purposes (commuting, leisure, both)
- Riding patterns (all-year, summer only)
- Location (urban, rural)

45 of the 66 riders took part in workshops, with each group of riders taking part in two two-hour workshops three weeks apart. The repeat-workshop format enabled us to test and develop findings from the first round of workshops in the second round. Workshops were designed to explore motivations, attitudes to risk, and the implications of these attitudes for key decisions around e.g. purchasing gear or managing fatigue.

The five series of workshops were recruited around the following broad behavioural groupings, defined in light of previous work by TRL (Sexton el al. 2004):

- All-year leisure riders (York)
- Summer-only leisure riders (Nottingham)
- Riders for work (Birmingham)
- Young riders (16-21) with smaller bikes (London)
- Commuters over 21 (Bristol)

It is worth noting here that retrospective allocation of participants to segments has confirmed a level of motivational diversity within these broad behavioural categories.

The remaining 21 of the 66 riders took part in semi-structured telephone interviews lasting 30-40 minutes, and exploring motivations, attitudes to risk, and the implications of these attitudes for key decisions around e.g. purchasing gear or managing fatigue. The interviews were undertaken prior to the workshops, and provided important clues regarding workshops' design. They were also important as a way of broadening the diversity of our sample: for example, this is a better way of engaging riders based in remote rural areas.

All interviews and workshops were recorded and transcribed. Following completion of the workshops and interviews, a single record was created for *each participant*, drawing together quotations from that participant relating to motivation, risk and decision-making. No effort was made in these records to analyse or interpret the comments made by the participants, beyond a high-level thematic grouping under headings such as 'motivation' or 'choosing a bike'. These records proved to be critical in future stages of the project, providing the best mechanism available to test emerging statistical patterns

against what individual riders had *actually* said (as opposed to what we thought they had said).

2.2 Quantitative Phase

2.2.1 Questionnaire Design

The objectives behind the chosen design were five-fold:

1 To determine how prepared a rider is to:

- Avoid accidents
- Reduce the consequences of accidents

With particular focus on:

- Bikes
- Helmets
- Protective clothing
- Fatigue
- New bike safety technologies

2. To capture the rider profile by which to analyse these results, specifically:

- Demographics
- Riding career
- Size and type of bike (ridden most often)
- Bike/car ownership and annual mileage
- Training
- Purpose of riding
- Riding experiences (in last 3 years) i.e. accidents, fines

3. To include questions used in past research by TRL (Sexton el al. 2004): so that the statistical model of Accident Propensity, developed in that study, could be applied to the new data base.

4. To use standard questions re:

- Training
- Helmet safety standards

used in ongoing DfT motorcycling tracking studies

5. To explore how and whether the riders can be segmented based on their motivations to ride, in ways that will help us to understand key aspects of decision making and behaviour which affect their vulnerability as road users.

All this had to be done in a questionnaire that would take no longer than 30 minutes to administer. A copy of the questionnaire can be found in the Appendix.

2.2.2 Sample

The motorcycling universe in Great Britain is small. Only 4% of GB adults claim to ride a motorbike (BMRB, 2006 and Mintel, 2006) but a large sample was required to represent it and facilitate statistically significant segmentation.

The target sample of 1000 riders was achieved by recruiting against quota controls based upon:

- Dft/DVLA registrations by engine capacity (Dec 05)
- TGI/BMRB survey information on rider demography/regionality and engine capacity (Quarter 1 2006)

In fact, 1,019 riders were interviewed in the final sample, 999 of which (98%) were capable of being allocated within the 7-cluster/segment solution subsequently derived. The 20 riders outside this solution either had not provided the full information required or allocation would have required the creation of such small groups that results of analysis would have been statistically insignificant. The following table gives a breakdown of the 1,019 riders who were interviewed by gender and the size of bike which they typically ride:

Table 2 - Interview respondents, by gender and age

	Total	50cc and under	51-125cc	126-500cc	501-700cc	701-1000cc	1000c+
Gender							
Male	897	75	144	144	183	194	156
Female	122	19	25	23	33	14	8
Age							
15-24	171	69	60	15	17	6	4
25-34	404	18	70	62	115	88	51
35-44							
45-54	441	6	39	89	84	114	108
55-64							
65+							

Base size: All respondents = 1019 (figures may not add to 1019 due to those who refused to answer particular questions)

2.2.3 Interviewing Logistics

The motorcycling universe may be small but it is highly visible. It was decided to employ interviewers who would recruit for themselves against a strict quota of interviews by size of bike and demography of riders.

70 interviewers were employed covering 100 locations across Great Britain to reflect the sizes of the motorcycling universe in each region.

Qualifying motorcyclists were recruited on the street and the interview took place there and then. If inconvenient, it was arranged to take place at the respondent's home.

This face-to-face interviewing methodology was chosen so that individuals who are difficult to research, for example by being reluctant to participate in indirect methods such as postal surveys, would be covered and the full questionnaire completed.

2.2.4 Fieldwork Dates

The survey was conducted between July 24th and September 14th, 2008.

It was important to conduct the fieldwork in the summer, since this is the peak season for motorcycle riding, and some riders only ride in the summer. If the fieldwork had been conducted outside this period we may have missed contact with this group estimated by Motorcycle Industry Association to represent as much as 36% of the total motorcycling universe (MINTEL, 2006).

2.2.5 Data Entry and Logistics

On completion, the interviews were hand-edited for completeness, coded, data entered with a 10% validity back check and then put through a detailed edit check.

Computer tables of the results have been forwarded to TRL with an SPSS programme to enable the database to be re-analysed and answer any future enquiries.

2.2.6 Constructed Measures

In this report there are a number of calculations made to measure the impact of certain variables. They were:

2.2.6.1 Segmentation

Firstly, the 30 'motivations to ride' statements (Q18B) were factor analysed into highly correlated groups. 4 to 10 groupings were reviewed and an 8-factor solution selected. It best described the key motivations identified in the qualitative research.

This 8-factor solution was then clustered and 4 to 10 clusters derived. Finally a 7-cluster/segment solution was formed. Seven was chosen due to 4 possibly grouping too many different types of motorcyclist together therefore certain characteristics may not be represented, whereas 10 would make the clusters too small for statistical analysis. The 7-cluster/ segment solution was selected on the basis of:

a) statistically robust numbers in each cluster/segment, and
b) their discrimination on key questions relating to commissioned policy issues, particularly:
    - fatigue (Q25)
    - choice of helmets (Q33)
    - protective clothing worn (Q38)

2.2.6.2 Accident Liability

This was not a study focussed on accident liability. However, a statistical model has previously been developed by TRL based on its survey of motorcyclists (Sexton el al. 2004). This took accidents defined as 'public road accidents' (including minor spills) in

the previous 12 months and correlated these with a range of variables, the most significant of which were:

- age of rider
- annual mileage
- years riding
- training (simply CBT/No CBT)
- size of bike (simply <125cc/>125cc)
- all year round vs. summer only riding

These significant variables were computed into an algorithm and applied to the data from the present study to produce an accident propensity for each rider. In this report, this is expressed as:

Level 1 – an accident once every 10 years plus (55.2% of total)

Level 2 – an accident every 5 to 10 years (26.5%)

Level 3 – an accident every 3 to 5 years (8.7%)

Level 4 – an accident every 3 years or less (9.6%)

Full technical notes are supplied in the Appendix.

2.2.6.3 Exposure to Safety Agencies

This was a simple measure of awarding one point for each of the following:

Q26 - Regularly visit motorcycle dealers

- Have a membership of a motorcycle club/organisation
- Regularly read motorcycle magazines
- Regularly visit specialist motorcycle websites
- Attend motorcycle events e.g. shows, races, track days etc.
- Have motorcycle regularly serviced

Q19/20 - Purchased bike new or 2nd hand from a dealer

Q28/31 - Purchased helmet new, within last 3 years, from a specialist motorcycle shop

Q34 - Aware of SHARP helmet safety rating

Q40 - Would purchase protective clothing from specialist motorcycle shop

The results were expressed as:

	Points	**% of total**
Very low	3 or less	22.3%
Low	4 to 5	34.3%
Medium	6 to 7	29.5%
High	8 points plus	13.2%

2.2.6.4 Preparedness to Ride

In Q45 the rider was asked how their riding habits may change according to 15 different situations from 'wearing only a T-shirt and trainers' to 'having seen a serious accident involving a motorcyclist'. These situations also included 6 specific situations involving fatigue.

Response was a 5 point scale between 'no impact' (+1) and 'definitely would not ride' (+5). If the rider was unwilling to ride under any circumstance he achieved an overall score of 75 (5x15). If he or she was willing to ride in any situation specified, the rider would achieve a score of 15 (1x15).

We allocated these scores to four levels:

- Ride under any circumstance (Score 15-30) – (8.4% of total)
- Think twice (Score 31-45) – (34.0%)
- Seriously consider not riding (Score 46-60) – (47.0%)
- Definitely would not ride (Score 61-75) – (10.6%)

3 Findings and interpretation

3.1 Findings about the riding universe

This section summarises the findings on the policy issues the research addressed. All quoted figures are based on the total sample of 1019 riders interviewed. If there were any significant differences by demographic or rider profile, they are also noted.

3.1.1 Safety Helmets

1. Type worn most often (Q27)

Full face is the helmet of choice for almost three quarters (74%) of motorcyclists. This is particularly true of under 45s (80%) and riders of sports bikes (89%).

Flip front helmets (14%) and open face (12%) make up the remainder.

Older motorcyclists (aged 45+) account for almost two thirds (64%) of open face wearers.

2. Age of helmet (Q28)

72% of helmets worn are less than two years old. In fact the mean age of all helmets is only 2.28 years.

Older helmets are more likely to be worn by the over 45s (2.84 mean age) and those riding less than 4K miles per annum (2.51).

3. Willing to continue wearing helmet if fallen on hard ground? (Q29)

One in six riders (17%) said they would continue wearing and a further 12% were unsure.

Young riders (under 24) are the most likely to continue wearing (25%).

4. Frequency of wearing (Q29)

Almost every rider (97%) claims they wear a helmet every time they ride.

The lowest level of wearing (93%) is found amongst riders with very low exposure to agencies promoting safety e.g. specialist motorcycle shops.

5. Where purchased (Q31)

Almost all helmet purchases are made from specialist motorcycle retailers (86%).

A small minority of young riders (under 24s) and moped riders acquired their helmet either 2nd hand or it came with the bike (12% and 15% respectively).

6. Main factor in the purchase other than price (Q32)

The main factors, mentioned spontaneously, are Comfort (30%) and Good Fit (21%).This is particularly true of over 45s (37% and 24% respectively).

Safety Features and Safety Certification are at the next level (20% and 16% respectively).

Young riders (under 24) and riders of mopeds are more likely to mention Looks more than any of the above (28% and 30% respectively).

7. SHARP Helmet Rating (Q34, 35)

22% of all riders spontaneously mentioned SHARP as a helmet safety standard they were aware of.

6% claimed to own a SHARP rated helmet. It should also be noted that at the time of fieldwork only new helmets would have this SHARP rating; eventually all helmets will have a rating and whether motorcyclists chose a high or low rating should be analysed.

SHARP awareness is higher amongst riders of 500cc+ bikes than 125cc or less (27% versus 14%) and riders with full licence than provisional (24% versus 14%).

Given that the scheme was announced in November 2007, and the first ratings posted in June 2008, just before the fieldwork for this study was conducted, the relatively high level of awareness among those who do not have a rated helmet is positive.

3.1.2 Bike Choice

1. Main factor considered when buying a new motorcycle other than price (Q22, 23)

Only 5% of riders mentioned safety or safety features spontaneously as a main consideration in the purchase of their next bike.

When prompted, 49% placed "great importance" on safety features (e.g. ABS, anti dive braking, traction control); which was higher than engine size/power (45%) and fuel consumption (39%) but lower than "looks" (61%).

2. Source of Bike Purchase (Q19, 20)

Almost two thirds (65%) of bikes ridden in the UK have been purchased second hand. Only 38% of these were bought from a dealer.

It is calculated that 40% of the UK Bike Population has been acquired without any professional advice at time of purchase. In fact, 29% of all second hand bikes are bought from small ads or eBay and 26% from friends or family. This is particularly true of under 24s; 37% acquire their second hand bike from a friend or family.

3.1.3 Protective Clothing

1. Incidence of wearing (Q37, 39)

94% claim to wear protective clothing, excluding clothing for weather protection only.

77% claim to wear it every time they ride.

Young riders (under 24) are the least likely to wear (86%) or wear it on every riding occasion (68%).

This is particularly true of scooter and moped riders. 17% of the former and 20% of the latter wear no form of protective clothing.

2. Protective clothing worn (Q38)

- 90% claim to wear a protective jacket
- 81% claim to wear protective trousers
- 79% claim to wear protective boots
- 90% claim to wear protective gloves
- 30% claim to wear back armour

Under 24s are the least likely to wear protective clothing, particularly protective trousers or back armour.

3. Factors of 'great importance' in next purchase of protective clothing (Q28)

Comfort is the main factor of great importance to riders (92%), followed by safety protection/ certification (80%).

"Looks" are of great importance to just over one third (36%).

Clothing is a distinctive feature amongst the segments. The type of clothing worn (leather, textile, armoured) as indeed helmet style worn, correlates with type of bike ridden. Also 'looks' are much more a feature of importance in some segments than suggested above. These differences are highlighted in the Segment Profile section.

4. High Visibility Clothing (Q43, 44)

When asked to give their main reason for the high fatality rate amongst motorcyclists (at Q46), 'not being seen by other road users' was the second most quoted (24%). A further 26% gave it as their second reason.

Despite this, the wearing of high visibility clothing is low. Only 39% of riders claim to wear and only 48% of these wear every time they ride.

There are no significant differences by individual cross breaks.

5. Fatigue (Q25)

In the last 3 years:

- 25% have ridden when tired
- 6% have ridden when too tired to ride safely
- 2% have been involved in an accident/near-accident due to fatigue

Young riders (under 24) and riders who ride as part of their job are more likely to have ridden when tired (36% and 44% respectively).

3.1.4 Training

1. Training/tests undertaken (Q15a)

The figures presented with respect to training are not mutually exclusive unless stated, therefore the percentages do not add up to 100.

- 59% have undertaken CBT training
- 30% have only had CBT training
- 25% have taken training for a test
- 22% have had no training at all
- 8% have undertaken specified post test training
- 15% have undertaken unspecified training (i.e. in the Army or in other employment)
- Over two thirds of under 24s have only taken CBT training (68%)
- 40% of over 45s have had no training whatsoever.

2. Training/tests actively being considered in next 12 months (Q15b)

- 10% Advanced Rider training (IAM, ROSPA, BikeSafe)
- 7% Larger Bike training (Direct Access - DAS)

Riders over 25 years old and riders of large bikes (>500cc) are more likely to be considering advanced rider training (11% and 15% respectively), whereas younger riders, and riders of 51-125cc machines, are more likely to consider larger bike training (21% and 28% respectively).

Only 29% of Provisional Licence holders are planning to take larger bike (Direct Access or DAS) training in the next 12 months, suggesting that the other 71% are either happy with the size of bike they currently ride, are under 21 so unable to take the training, or are considering giving up motorcycling. It is worth nothing that in fact only 55% of these

provisional licence holders claim that they would 'definitely' be riding a motorcycle in 3 years time.

3.1.5 Riding experiences in last 3 years (Q25)

Ten possible riding experiences were shown to respondents:

Riding experiences in last 3 years (Q25)	Total percentage (1019 total sample size)
Known somebody who had a motorcycle accident involving serious injury *or death	37%
Fallen off your motorcycle	32%
Ridden when tired	25%
Overestimated your abilities when riding	16%
Had an accident requiring medical treatment	11%
Taken a risk when riding to impress others	7%
Fined for speeding on your motorcycle	6%
Ridden when too tired to ride safely	6%
Convicted for any other riding offence	3%
Been involved in an accident/near accident due to fatigue	2%
None	28%
Did not answer	4%

* Please note that in STATS19, a serious injury is defined as admitted to hospital or died 30 or more days after the accident, or one of the following: a fracture; internal injury, severe cuts, crushing, burns (excluding friction burns), concussion or severe general shock requiring hospital treatment, whereas no definition of serious was provided for this question.

Under 24's are more likely to have fallen off the bike (52%), taken a risk to impress others (19%) and been convicted for a riding offence (7%).

Those riding as part of their job are more likely to have ridden when tired (44%) and known somebody who had a motorcycle accident involving serious injury or death (48%).

Otherwise there were no significant differences across the sample except to say that high mileage riders, riding over 4,000 miles a year and all year round riders are more likely to have experienced all of the above. Interestingly, these are two of the components in the TRL Accident Propensity measure.

3.1.6 Key Findings

1. It is early days for SHARP (launched in October 07) but it is less likely to reach young riders if it is solely promoted in specialist motorcycle stores.
2. One in six riders would continue to wear their helmet if they dropped it on hard ground, with young riders (under 24) being the most likely to do so.
3. Amongst the young, 'looks' of the helmet are a more important factor in purchase than safety features or safety ratings.
4. Safety features such as ABS are not a main 'top of mind' factor when buying a bike, although almost 50% will say it is of 'great importance' when prompted.

5. Young riders and riders of scooters and mopeds are the least likely to wear protective clothing or wear it every time they ride.
6. The low incidence of wearing High Visibility clothing is interesting, particularly in light of the large proportion giving 'not being seen by other road users' as the reason for high motorcycle fatality rates.
7. Fatigue is experienced by a quarter of all riders, particularly amongst those who ride as part of their job.
8. 3 out of 10 riders have only received CBT training.
9. Only 55% of provisional licence holders claim they would be 'definitely' riding a motorcycle in 3 years time.
10. Many (86%) helmet purchases are made from specialist motorcycle retailers. However, there was variation between the different groups of motorcyclists.

3.2 Making sense of the segmentation

The selection of a segmentation solution always involves an element of judgement. In this study, a seven segment solution was chosen, on the grounds that:

- It offered the highest degree of discrimination in the areas on which this study was focused, e.g. decisions around purchase, and fatigue.
- It provided the best fit with and most illumination of the qualitative findings – our interpretative proxy for the segmentation being a good reflection of real differences 'in the world'.

In choosing a seven segment solution, however, we were also aware of some potential challenges connected with opting for a relatively large number of segments.

The first is that a larger number of segments means fewer respondents in each segment, and as a result fewer statistically significant differences. The table below sets out the sizes of the seven segments; it will be seen that the smallest, Segment 2, has only 83 members.

Nevertheless, thanks to the overall size of the sample, we were encouraged to find a large number of statistically significant results in our preferred solution – more, indeed, than in some of the potential solutions with fewer segments. As the detailed profiles of each segment in Section 3.2.5 demonstrate, the size of the segments has in no way proved a barrier to characterising them.

Table 3 – Segment sizes

	Number of riders*	% of total
Segment 1	145	14.5%
Segment 2	83	8.3%
Segment 3	147	14.7%
Segment 4	248	24.8%
Segment 5	163	16.3%
Segment 6	112	11.2%
Segment 7	101	10.1%

* Note that 999 of the total 1019 respondents were allocated to one of the seven segments.

The second potential challenge is that a large number of segments, while perhaps a better reflection of real diversity, may prove unwieldy for practical applications to e.g. policy development or communications planning, especially when the universe being segmented is already relatively small.

This is a legitimate concern. It is our belief, however, that the segmentation we are offering remains highly pragmatic because it has an *underlying structure*, a network of similarities and differences linking the segments together. This structure means that it is possible, for specific purposes, to group segments together – although the power of the underlying segmentation remains in that segments may be grouped in different ways for different practical purposes.

Therefore, this section provides an analysis of the underlying structure of the segmentation, before offering detailed profiles of the individual segments.

3.2.1 Overview of motivational factors

In Q18b, respondents were asked which of a list of 30 statements identified during the qualitative work described the things that were important to them about riding a motorbike/scooter/moped (on a five-point scale running from very important to not important at all). Eight 'motivational factors' were identified from analysis of responses to these statements, which were used as the basis for the segmentation exercise.

The eight factors, which are therefore important in the underlying structure of the segmentation, are presented below, together with the statements making the largest contributions to each, and the scale of that contribution. (Note that some statements contribute to more than one factor).

F1 Power of the bike

S8	Having much more power than in a car the same price	0.8
S9	The feeling of acceleration	0.8
S7	Going really fast	0.8
S11	Being able to get away faster than people in cars	0.7
S6	The feeling of exhilaration	0.4
S12	The feeling of keeping the motorcycle balanced	0.3
S14	Feedback from the motorcycle, including noise and vibration	0.3
S24	Pitting myself against others	0.3
S10	The sense of achievement after a good ride	0.3

"I've heard someone say the differences between cars and bikes, to get a car to do 0 to 60 in 3 seconds you've got to spend £50,000, £60,000. I spent £4,500 on my bike and it will do it. That is the main difference, is the torque between the two is massive. You can easily get from 30 to 100 and you can do that in a couple of seconds, really easily." [M, 39, 700cc]

"There is definitely the element of speed. When you get into the 150 mark and it's light as a feather and everything is a bit of a blur." [M, 35, 1000cc]

F2 Belonging

S30	A sense of belonging and camaraderie	0.8
S29	A sense of heritage or tradition	0.7
S27	Riding is part of my identity	0.7
S28	Feeling at one with the machine	0.6
S25	The social interaction with others who ride	0.6
S26	The fact I look good on the motorcycle	0.3
S10	The sense of achievement after a good ride	0.3

"When you go out in a car, you go out in a car. When we go out and there's a group of us, we have a laugh and you meet up with other bikers and you have a laugh. When you're at race tracks, there's always jokes going about and stories." [M, 47, 900cc]

"It's just in my blood. I don't think I could ever live without having a bike." [M, 40, 1000cc]

F3 Relationship with the bike

S20	Heightened awareness of everything around me	0.7
S22	Understanding the motorcycle and taking care of it	0.7
S21	Feeling totally relaxed on the motorcycle	0.6
S19	Learning new things and getting better	0.6
S12	The feeling of keeping the motorcycle balanced	0.4
S28	Feeling at one with the machine	0.4
S15	The chance to enjoy the weather and the scenery	0.4
S25	The social interaction with others who ride	0.3
S10	The sense of achievement after a good ride	0.3

"I think when you're on a bike you don't have that enclosed feeling of a car. You're not enclosed on a bike. You tend to move around freely, every movement you make has an effect on the bike's handling and things like that." [M, 30, 1000cc]

"So, when the wheel's out, invariably you take your own wheel out, take it down, get it fixed, but while that's out you've got the callipers off, so you're looking at your brake pads, you're looking to see if things are clean in there. If anything was wrong straight away you'd know that." [M, 62, 1000cc]

F4 Self-sufficiency

S2	Not having to rely on others/public transport to get around	0.8
S3	Being able to get to places quicker	0.8
S1	Saving on fuel and parking	0.7
S4	Not having to bother about anyone else	0.7

"You can get everywhere probably in half or two thirds of the time by any other form of transport. I like the independence of being able to just door-to-door and actually getting on a bike and not having to wait for a bus, or train, or whatever." [M, 26, 1000cc]

"There's no-one on the back of your bike […] so the feeling of being by yourself, you're making your own decisions, and I think that… no… I don't know, being by yourself, I think it's just the fact that you are like a performance rider, and people see you as a single person." [M, 24, 125cc]

F5 Sensations

S13	Being exposed to sounds and smells when on the motorcycle	0.8
S16	Feeling the wind rushing past you	0.6
S14	Feedback from the motorcycle, including noise and vibration	0.6
S15	The chance to enjoy the weather and the scenery	0.5
S12	The feeling of keeping the motorcycle balanced	0.3

"Appreciating the environment really: the sense of it, the smell that you get that you don't get in cars, the feeling of the sun on you. I haven't said that with great clarity, have I? That sense of freedom and that you're pioneering as well. It's just a good feeling." [M, 55, 1200cc]

"I like my body being open to the elements. I think that's important to me, physically. When you feel the wind and stuff on your chest, it actually is quite a nice feeling, if you're wearing the right clothes I guess." [M, 32, 125cc]

F6 Challenge of riding

S17	Never knowing what is going to happen next	0.7
S18	The challenge of testing myself and my abilities	0.7
S19	Learning new things and getting better	0.5
S12	The feeling of keeping the motorcycle balanced	0.3
S24	Pitting myself against others	0.3

"I like to enjoy riding in built-up areas because you're constantly thinking and being kept on your toes and being aware of other drivers. You always keep looking out and there is never a quiet moment." [M, 17, 50cc]

"You've got three dimensions: you've got to get your speed right for the corner, your braking right, your lean right, and be in the right gear. Overall challenges that you try and meet and make it sort of right." [M, 26, 1000cc]

F7 Showing off

S23	Demonstrating my skills to others	0.7
S24	Pitting myself against others	0.7
S26	The fact I look good on the motorcycle	0.6

"Sometimes a bit of common rivalry if you go out with others." [M, 42, 600cc]

"They've all got 125s as well, but I'm just like faster than them. It's not like a competition, but I'm always trying to go faster than them." [M, 18, 125cc]

"You've got to look good on your bike. If someone doesn't look good on their bike, you'll tell them. The colour of it, patterns matching helmet and outfit, and stuff like that. [M, 18, 50cc]

F8 Release

S5	Getting away from everyday life	0.8
S6	The feeling of exhilaration	0.7
S10	The sense of achievement after a good ride	0.4
S15	The chance to enjoy the weather and the scenery	0.4
S16	Feeling the wind rushing past you	0.4
S3	Being able to get to places quicker	0.3

"It's that feeling of getting away from a built up area and being isolated and being somewhere that is quiet. It is either just you or maybe a mate on another bike, and the feeling of achievement when you get there and you get there safely." [M, 50, 1100cc]

"Most people I know just associate it with a feeling of freedom that we all do. They don't want to be taking the wife and kids on the back and have the kids screaming in the rear. It's just something that they go out and do, maybe on a Sunday morning with their mates, and be something for them." [M, 44, 1000cc]

3.2.2 The passion dimension

The first structural dimension of the segmentation is in fact not one of the eight motivational factors above – which distinguish different *qualities* of motivation – but a more straightforward measure of what might be seen as *quantity* of motivation: passion.

The importance of passion as a differentiator in the riding population was already clear after the qualitative phase of research. Many participants in that first phase of work described riding as an activity with intrinsic value – an activity to be pursued purely for its own sake, with which one feels a strong emotional connection.

"Even if you don't sit on one for ten years, the passion's still there." [M, 45, 750cc]

"If you went on one, honestly, I think a lot of people would come back and say: God, that was fantastic. I would say 80%, 90% of people would say that." [M, 47, 900cc]

"It's not just a way of getting from A to B." [M, 42, 100cc]

[Pre-driver rider anticipating driving after riding] "It will just be a lot more boring in a car. All you do is turn the steering wheel to go round the bends." [M, 18, 50cc]

By contrast, some other riders found little intrinsic value in riding, and choose it as a means of transport purely because it is the most convenient, economical, or perhaps the only means accessible to them.

"I'm not a lover of bikes, I must say. This is out of necessity rather than pleasure. […] I live in [area], and it's a parking scheme, so the car is parked elsewhere, and it's just financially better for me to use the bike to get to work and back. I can bring it indoors rather than pay to have it outside. […]" [M, 44, 250cc]

"A bike is a thing to get you from A to B. It's a functional item." [M, 53, 125cc]

The element of 'passion' here was easier to pick up as an interviewer or workshop facilitator than to trace in relatively unemotional transcripts. Walking into a room full of passionate riders, keen to describe – even to sell – the experience of riding was very different from walking into a room of bike-users for whom the topic was about as engaging as catching a bus. Given this, we were keen to include a question in the quantitative survey on the topic of passion:

> Q18a: How passionate are you about riding a motorbike/scooter/moped?

Responses to this simple question across the segments reveal a clear and powerful structure (which also mirrors our hypothesis after the qualitative work that we would find a clear distinction between high and low passion groups of riders).

- Two HIGH PASSION segments, segments 2 and 5, have significantly higher mean passion scores than four of the other segments (1, 3, 6 and 7) and than riders in general.
- Two MEDIUM PASSION segments, segments 1 & 3, have significantly higher mean passion scores than two of the other segments (6 & 7) – but significantly lower mean scores than the high passion segments.
- Two LOW PASSION segments, segments 6 & 7, have significantly lower mean passion scores than all the other segments and than riders in general.

An identical pattern of significant differences between segments is found in responses to a second question which looked at the commitment of riders to riding:

> Q21. On a scale of 1-5, where 1 equals 'definitely not' and 5 equals 'definitely', how likely are you to still be riding a motorcycle in 3 years' time?

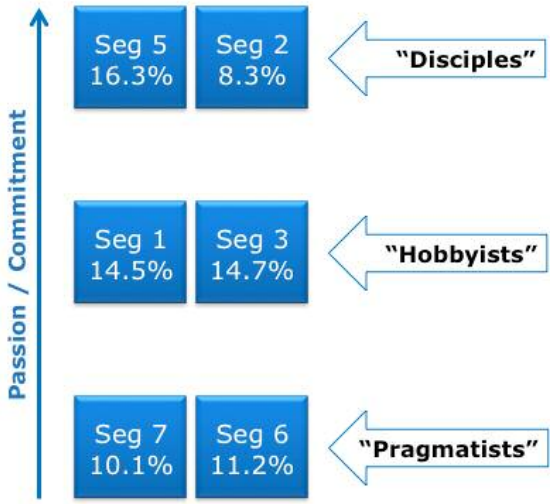
That is, the more passionate a segment, the stronger its stated commitment to riding.

"I didn't really think about it, but when the ambulance took me, and my wife who was heavily pregnant and my mum turned up, I said: yes, that's it, I won't ride again. And that lasted for all of about three minutes. Somebody took my bike and – is the bike secure? And stuff like that, and you're concerned about that. I don't think there was ever any doubt." [M, 35, 1000cc]

This clear, statistically significant structuring of six of the seven segments into three pairs on two separate questions is all the more striking because neither of the questions was used in creating the segmentation. Put simply, there appears to be a strong relationship between quality of motivation (the patterns revealed by the segmentation) and quantity of motivation (passion/commitment).

The figure below shows how passion/commitment can be used as a 'vertical axis' to map six of the seven segments, and shows the labels – 'Disciples', 'Hobbyists' and 'Functionalists' – which we suggest for the three passion levels.

Figure 3 - Segments organised by passion



These segments account for just over three quarters of our sample. The remaining quarter falls into Segment 4, which is not shown on the chart above.

Segment 4's mean scores on passion and commitment break the clear pattern shown by the scores for the remaining six segments. On passion, the mean score for Segment 4 is almost as high as the High Passion segments, though it is not significantly higher than the mean of Segment 1, one of the two Medium passion Segments. On commitment, by contrast, the mean score for Segment 4 places it with the Medium Passion segments.

Since Segment 4 accounts for nearly a quarter of the riders in our sample, this might seem like a fairly strong argument against the simple three-level pattern suggested in the diagram above. In fact, however, we shall see that there are good reasons why Segment 4 breaks not just this pattern but many other patterns that exist in the other six segments.

We discuss Segment 4 further in Section 3.2.4.4. Until then, the discussion will focus on the underlying structure of the other six segments.

3.2.3 The performance dimension

The passion dimension clearly organises six of the seven segments into three pairs: the disciples, the hobbyists and the functionalists. But if passion provides a 'vertical axis', what is the 'horizontal axis' that distinguishes segments within these pairs.

No one motivational factor shows statistically significant differences in all three pairings. Nevertheless, a clear pattern does emerge across two of the factors and the eight motivation statements contributing most to them (see list below). We have called this dimension 'performance', as the factors that underpin it relate to the performance of the bike and the rider:

Factor 1	Power of the bike
Factor 6	Challenge of riding
S7	Going really fast
S8	Having much more power than in a car the same price
S9	The feeling of acceleration
S11	Being able to get away faster than people in cars
S12	The feeling of keeping the motorcycle balanced
S17	Never knowing what is going to happen next

S18 The challenge of testing myself and my abilities

S19 Learning new things and getting better

A keen interest in the power of the bike was apparent in a number of those we spoke to during the qualitative phase of work. For many, this interest in the bike's capabilities was clearly linked to the performance challenges created for the rider.

"Whatever you do that keeps that thing standing up. If you're off it, it falls over. You are controlling what it's going to do: not only the speed of it, but the fact that if you go too slow it could fall over, and whatever speed you're doing and whatever manoeuvre you make, you're on that point of balance, and it's like a trapeze artist almost." [M, 46, 600cc]

"You need to be able to feel that you can benefit from the corners and not feel like you're fighting the bike. So yes, it is the handling – that's what makes most motorcyclists do it. I think it's the buzz of getting round the corners." [M, 42, 600cc]

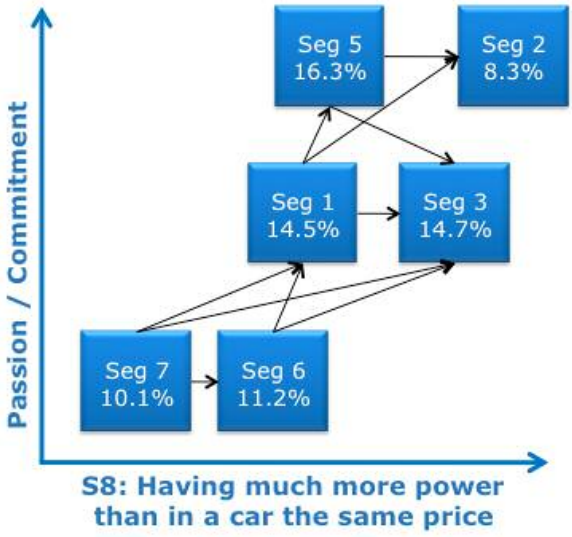
Just as with passion, however, there were other participants for whom performance – bike's or rider's – was either not of interest, or even in a few cases actively off-putting.

"What I can't get my head round is the chap – I think yourself – spoke a little bit about… you mentioned 1200 or something. I imagine there are bigger. But I just can't get my head around the fact of putting that size capacity of engine on a chassis of that size. I can't get my head round it." [M, 44, 250cc]

Unlike passion, we did not identify performance as a key structural dimension for segmentation during the qualitative work. This was because it seemed to us that the interest in performance broadly increased with the passion of the rider. As we shall see, the quantitative findings show that this is true up to a point, but not the whole story.

As mentioned above, neither of the two factors in the list above shows statistically significant differences across all three pairings. The same applies for the statements – with one exception: S8 Having more power than in a car the same price. The figure below shows the significant differences between the six segments in responses to this statement as arrows, with the arrow pointing from the lower to the higher mean score, and the segments placed horizontally roughly in line with their mean scores.

Figure 4 – Significant differences on S8



What is striking – and supports the use of a general performance dimension rather than a narrow 'powerful bike' dimension – is that this broad pattern is consistently repeated

and amplified across both factors and the other seven statements supporting them. (With a larger sample, we believe that both the factors and the statements would begin to show this pattern individually).

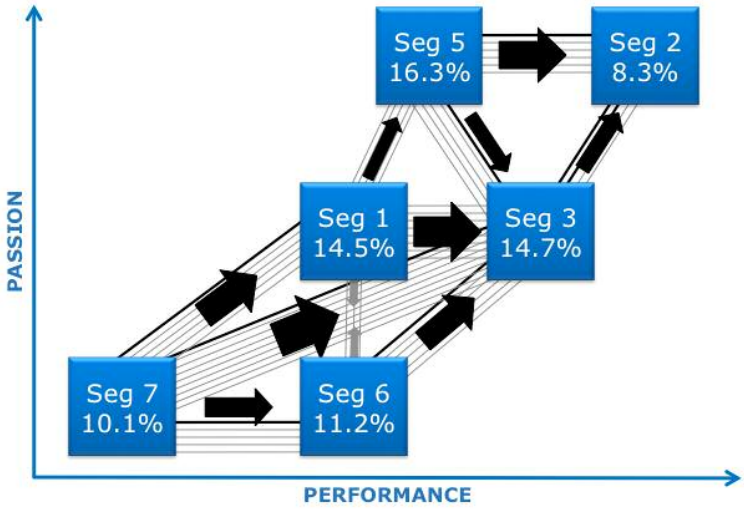
The table below shows, for each possible pairing of segments, the number of factors (out of 2) and statements (out of 8) on which a statistically significant difference exists. (The first number in each case is the number of factors on which a significant difference exists; the second the number of statements).

Table 4 – Number of significant differences between segments on performance related factors and statements (excluding Segment 4)

		Lower segment					
		2	**3**	**5**	**6**	**1**	**7**
Higher segment	**2**		2 – 2	1 – 5	1 – 5	2 – 7	2 – 7
	3	0 – 0		1 – 4	1 – 5	0 – 8	1 – 8
	5	0 – 0	0 – 0		0 – 5	0 – 6	1 – 8
	6	0 – 0	0 – 0	0 – 0		1 – 3	1 – 4
	1	0 – 0	0 – 0	0 – 0	0 – 3		0 – 5
	7	0 – 0	0 – 0	0 – 0	0 – 0	0 – 0	

In this table, the segments have been ordered to illustrate the clear pattern in the numbers: with one sole exception (between segments 1 and 6), the direction of difference is consistently in one direction. The same point can be made graphically by overlaying plots like the one for S8 above for both factors and all eight statements. The figure below shows this plot – with the horizontal positioning of the segments being in this case a qualitative one, based on the overall number and alignment of differences. (Differences between the two High Passion segments, 5 and 2, and the two Low Passion segments, 6 and 7, have not been shown, to aid the legibility of the diagram.

Figure 5 – Performance dimension

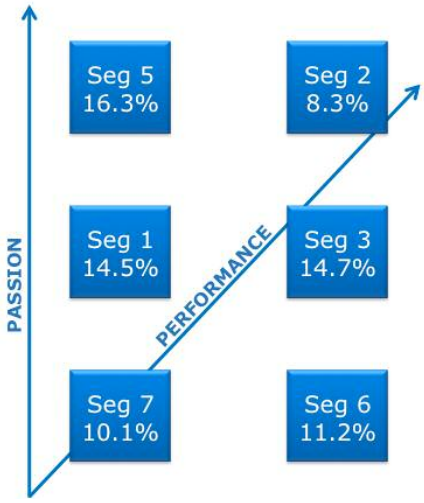


This graphic makes it clear why, during the qualitative phase of work, we did not identify performance as a key structural dimension. As the rightward skew of the plot shows, an

interest in performance is not independent of levels of passion. At each level of passion, however, it is performance which is the key differentiation between segments – even if, for the Low Passion segments, this is to say there is a difference between a segment that is not very interested in performance (Segment 6) and one that is not interested in it at all (Segment 7).

For ease of presentation, we will skew the six segments hereafter to create a simple 2x3 matrix, as in the graphic below. As this indicates, this is equivalent to rotating the performance axis towards the passion axis.

Figure 6 – skewed segment structure



3.2.4 Introducing the segments

The performance dimension overlays two of the eight motivational factors identified (Factor 1, Power of the bike; and Factor 6, Challenge of riding). This leaves six motivational factors still to be accounted for, however. Of these, five operate within the structure already outlined to characterise the six segments further, and map how varying combinations of passion and performance translate into recognisable patterns of rider motivation.

In this section, we briefly introduce the six segments using these five motivational factors. (The final factor is discussed, along with the remaining segment, in Section 3.2.4.4.) Full profiles of the segments are provided in Section 4.

The factors in question are:

F2 Belonging

F3 Relationship with the bike

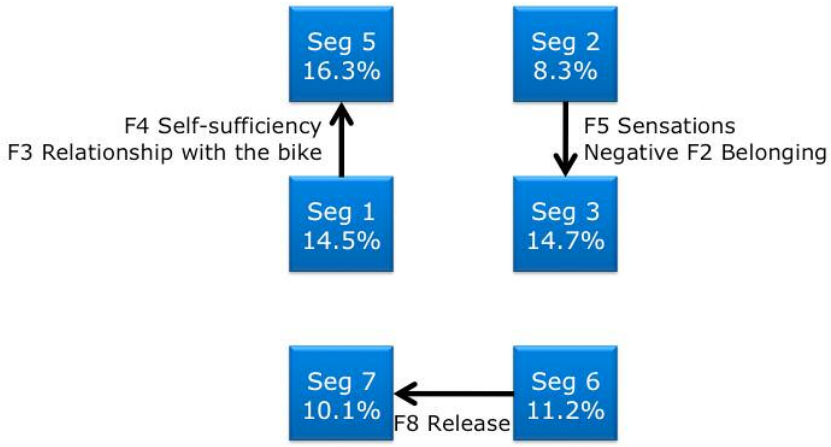
F4 Self-sufficiency

F5 Sensations

F8 Release

While different combinations of these factors play out in each of the segments, a useful simplification is to see each of the five factors as characterising a statistically significant (and substantial) contrast between two 'adjacent' segments which score significantly higher and lower on this factor. The figure below illustrates these contrasts, with the arrow pointing in each direction from the segment which is lower on the factor to the one that is significantly higher. (The Belonging factor has been made 'negative' to ease presentation: Segment 3 is very low on Belonging, Segment 2 very high.)

Figure 7 – Factors 2, 3, 4, 5, and 8 mapped onto segment structure



The sections that follow expand on this graphic, introducing the segments in the pairs indicated – starting with Segments 5 and 1.

3.2.4.1 Passionate low-performance segments (5 & 1)

Segments 5 and 1 are both significantly skewed to the 45+ age range, with a fondness for big non-sports bikes (including bikes bigger than 1000cc), a liking for leather gear, and a higher than average ownership of open-face helmets (although in line with all other segments, the majority use full-face helmets). Both segments are also high on the belonging factor, placing a major emphasis on being part of a community of riders.

Alongside these similarities, however, are some important differences between the two segments. For Segment 5, the high passion segment, riding is a whole way of life. In particular, riding is pivotal in making them self-sufficient (Factor 4). For them, the relationship with the bike (Factor 3) is a critical part of their identity, and the basis of the sense of fraternity they feel with other riders. The segment shows a strong skew towards riding for pleasure all year round.

We have called Segment 5 "**Riding Disciples**". These are passionate riders for whom riding is a way of life, built on a strong relationship with the bike itself and membership of the wider fraternity of riders.

"I think the biggest difference between a biker, someone who rides bikes regularly and somebody who just drives cars is the amount of thinking that we do about our riding." [M, 45, 600cc]

"I think the camaraderie as well with other bikers. Just talking like this." [M, 45, 750cc]

"I started riding a motorbike as soon as I could ride a two-wheel pushbike really. I used to ride motocross, did a bit of road racing, and it's just always been in my mind. I have never been without a bike." [M, 50, 400cc]

By contrast, for Segment 1, the medium passion segment, riding is just a nice part of life. They lack the need for a strong relationship with the bike, and have no interest in using it to achieve greater self-sufficiency – perhaps because 1 in 5 of them are company owners or directors. Like Segment 5, they are more likely than the average to ride for pleasure – but only in the summer.

We have called Segment 1 "**Riding Hobbyists**". These are older summer-only riders who enjoy the social interaction with other riders almost as much as the riding itself – and who like to look the part.

"My sister-in-law is a biker and her fiancé is a biker, so if we can get a few of us to ride together, then we will, we'll all go for a ride somewhere and pull in somewhere, have something to eat or something. […] If you are going out with the lads and you go out for a ride, you leather up. If I got out commuting, like I am now, I don't." [M, 33, 600cc]

"I'm not into these four cylinder, computer controlled things. I like the older feel of a bike, the older bikes. […] You can't really wear rain gear on a Harley. You've got to look the part. It has to be the leather jacket and to fit the image a bit. All bikers are actors really, we're all posers." [M, 57, 1200cc]

3.2.4.2 Passionate high-performance segments (2 & 3)

Segments 2 and 3 are both skewed to the 25-44 age range, with a fondness for sports bikes of 500cc and up, and an above average preference for full-face helmets. Both place a major emphasis on the performance of the bike in particular.

Alongside these similarities, however, are some important differences between the two segments. For Segment 2, the high passion segment, performance is an end in itself – including their own performance, as well as that of the bike. They are keen to avoid anything that gets in the way of this high performance, such as the various sensations that go with riding (Factor 5): for instance, 8% of this segment (significantly more than the mean and than Segment 3) identified 'noise reduction' without prompting as the main factor other than price that would affect their choice of safety helmet. This obsession with performance creates a strong sense of identity with like-minded riders (Factor 2). The segment shows a strong skew to riding for both pleasure and commuting, all year round.

We have called Segment 2 "**Performance Disciples**". These are committed all-year riders with a total focus on high performance riding – and a strong dislike for anything that gets in the way of it.

"Any muppet can go fast in a straight line, simple as that. Why do you feel most people who ride bikes don't go on a motorway? It's the bends, isn't it, that's the skill. It literally is you and the bike. The bike is always going to be better because it's engineered to do that. A car, the input that the driver has is taken away; on a motorcycle it's not." [M, 38, 650cc]

"There's actually videos of cameras on bikes doing the Isle of Man laps, and I sit there and my heart's going like just watching the video. […] It is absolutely awesome. They have different brains, they must have. I've been down roads at 130 that they go down at 190, and you can't stop on the road. It's bumpy and you're banging round corners. And things are just going round flat out." [M, 52, 1000cc]

"[Sports bikes] are more dynamic bikes to ride than a standard motorcycle. You're involved in every single little thing. In much the same way that you are in a sports car, where you feel through the seat of your pants. It's very much like that on a sports motorbike. You're aware of every little thing you do making an effect to the way the bike handles. It's more like a race bike, if you like. And that's what makes us excited about bikes." [M, 42, 600cc]

By contrast, for Segment 3, the medium passion segment, performance is a means to pleasure. They love the sensations that go with riding – such as noise and vibration. The pleasure of riding is for them a solitary one, and they have a very low interest in bonding with other riders. Like Segment 2, they are more likely than the average to ride for pleasure and commuting – but only in the summer.

We have called Segment 3 "**Performance Hobbyists**". These are solitary, summer-only riders, for whom riding is all about individual experiences and sensations – and who couldn't care less about what other riders are doing.

"[Describing a fantasy trip to Africa] You just get that closeness. You haven't got that protection. You've got you. You haven't got anybody else driving you, you've got to rely on yourself. I think it's the challenge: you're pushing yourself, you're not just pushing the machine. Well, you are pushing the machine, but you've got your own abilities. Anybody can drive a jeep, anybody can drive a car, but to get to environments like that on a bike, it's different. And I think that will be absolutely amazing. You're going to be dirty. […] You'll just be red by the time you get off, because that's what the colour of the soil is, so you'll just be washing it off your skin for a week. But that's just part and parcel of doing it. And it is an amazing place. Everywhere is different. You go over a hump and you find tropical plants. You drop into a bit of a canyon or something. It just changes every two miles or so." [M, 38, 600cc]

3.2.4.3 Pragmatist (low passion) segments (6 & 7)

Segments 6 and 7 are characterised by a shared lack of passion for or commitment to riding. These are riders for whom the bike is a pragmatic alternative to the car, valued primarily for its economy or increased mobility. The segments include higher than average numbers of novice riders and provisional license-holders, and have very low exposure to informal sources of safety information such as dealers, specialist press or websites, and so forth. Low mileage riders, with a strong skew to all-year commuting on urban roads, they show an above average preference for scooters and mopeds, flip-front helmets (though the majority wear full-front helmets) and textile jackets.

Alongside these similarities, however, are some important differences between the two segments. For Segment 6, the bike is a stepping stone to a car. This segment is heavily skewed towards the 15-24 age group, and is the least likely of any segment to have a full driving licence (i.e. to drive a car).

We have called Segment 6 "**Car Aspirants**". These are young people looking forward to getting their first car when age/finances allow – but for the time being just happy to have got their own wheels.

"When university's over, then I'll get a car." [M, 19, 125cc]

"I was going to get a scooter when I was 16 but then they introduced free bus travel so I didn't get one. When I hit 18, I had to pay so I thought I'll get a scooter." [M, 18, 120cc]

By contrast, for Segment 7, the bike is a way of escaping the car (Factor 8). Unlike Segment 6, this segment has an average age profile. It also has a strikingly high representation of women (28% against 12% of the total sample): in fact, 23% of the women in our sample were in this cluster. Two thirds of the segment also drive a car, with average driving mileage (c. 10k miles pa). Increased mobility gives this group not just a better way of commuting, but also increased access to fun – especially in the summer.

We have called Segment 7 "**Car Rejecters**". These are escapees (a higher proportion of women than in any other segment) from traffic jams, parking tickets, fuel costs and other horrors of the car – who don't care for motorcycles, but do care for low-cost mobility.

"I have been riding just over a year last month. I learned to ride a bike because I work over the road and commuting in the car I had at the time was too much for me on fuel and parking combined, so it was free to park, where we work, with bikes. So it was quite a money save thing." [F, 25, 600cc]

"When I first started my business, I used to use public transport and I just got so fed up with public transport, that I decided to get myself a scooter to get from point A to B in a much quicker time" [M, 45, 125cc]

"Because I got a job that was eight miles away and I knew that driving… I didn't want to drive something that was environmentally unfriendly. And it seemed like a very practical way to get to work." [F, 41, 125cc]

3.2.4.4 Segment 4

The discussion so far has focused on the six segments which are clearly structured into three pairs by the passion dimension.

The remaining segment, Segment 4, is defined primarily by the single remaining motivational factor, Factor 7 – Showing off. In fact, this segment displays a kind of undifferentiated passion for riding, scoring significantly higher mean scores than riders in general on an astonishing 28 of the 30 motivational statements. (The only items for which it does not score higher than riders in general are S20 - Heightened awareness of everything around me – and S22 – Understanding the motorcycle and taking care of it.) But it is on Factor 7 that the difference from the other segments is focused, with the mean score for the segment being significantly higher than the mean for riders in general and for all six other segments.

The demographic profile of the segment provides more illumination. The group is heavily skewed toward young people – indeed 40% of the 15-24 age group in our sample were allocated to this segment – and is high on novices and provisional licences. While the statistical evidence cannot provide support for hypotheses about change over time, we believe that many riders in this segment may mature into members of the other high passion segments, with a more settled motivational profile. It is striking how many of the older participants in our qualitative phase of work, who now clearly belong to other Segments, described having started out in ways that sound very much like Segment 4:

"I've been riding for 22 years and basically started because all my mates were, so you could just jump on and taz around the streets, illegally at first obviously. […] You'd just buy any rubbish, don't you. It's not MOT-ed or anything like that. Like the Mini Motos are today, all the kids on the Mini Motos round the roads. We all did it, didn't we?" [M, 42, 750cc]

"Everybody did it. I mean my mates had bikes. Oh, do you want a go on it? And I tried a 404 and I loved it. I were only 17. I thought, Gordon Bennett, brilliant, out of this world, I want one." [M, 47, 900cc]

Of course, caution is needed here: while the segment is heavily skewed towards young riders and novices, it also contains some older and more experienced riders.

We have called Segment 4 "**Look-at-me Enthusiasts**". These are young (or never-grew-up) riders with limited experience but limitless enthusiasm, for whom riding is all about self-expression and looking cool.

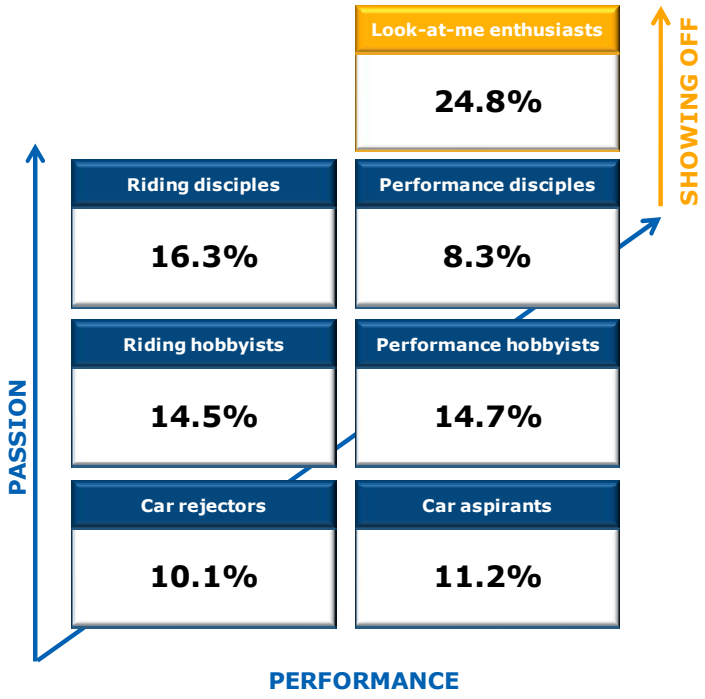
"I've never really had a role model. I don't know that I would look up to riders. If I see a guy on the internet on a dirt bike doing some of those mad stunts, I would think that they're good – I would look up to them. When I see things, people doing some mad wheelies, standing up, I think to myself: I wish I could do that. I'd like to be like them." [M, 16, 50cc]

"I've always thought that people on motorbikes are super cool." [M, 24, 125cc]

"I think his motivation to have a bike is to try and go out with his mates and to be the first one to get from A to B. […] Rather than tell us to slow down, he wants to try and beat us, rather than just say: just go a bit slower for me. It's the type of person, not so much the type of training. But then, when he was going to wheelie school…" [M, 39, 650cc, describing mate]

The inclusion of Segment 4 – fairly high on passion and commitment, high on performance, but primarily defined by showing off - completes the underlying structure of the segmentation, as illustrated in the graphic below.

Figure 8 – Complete seven segment structure

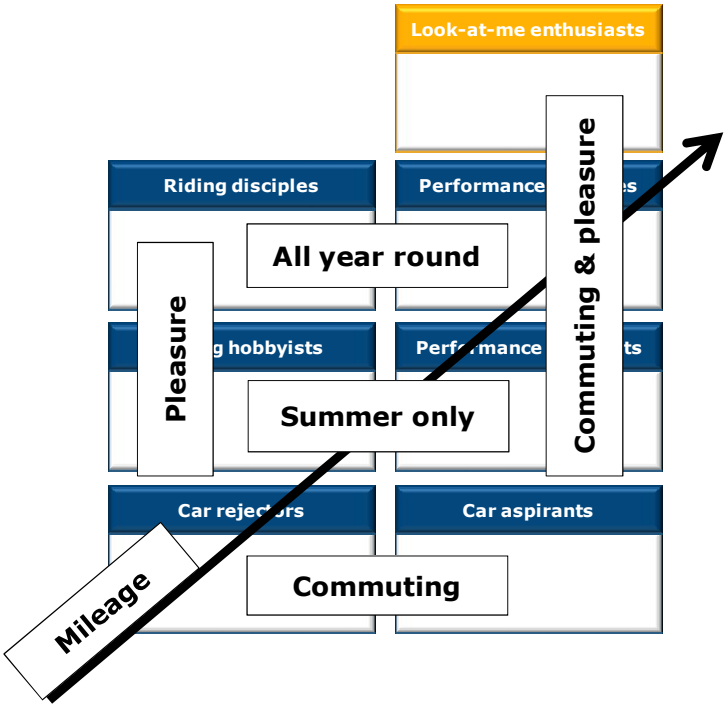


3.2.5 Grouping segments: a pragmatic approach

At the beginning of Section 3.2, we noted the potential challenge that a large number of segments, while perhaps a better reflection of real diversity, may prove unwieldy for practical applications to e.g. policy development or communications planning, especially when the universe being segmented is already relatively small.

In response to this legitimate concern, the underlying structure set out above allows us to see how, for specific purposes, segments may be grouped together in different ways. Take for example, the distinctions between all-year and summer-only riders, or between those who ride solely for pleasure or for pleasure and commuting. These distinctions map well onto the segmentation, but combining them differently: so, for example, Riding Disciples are paired with Riding Hobbyists as riders for pleasure, but with Performance Disciples as all-year riders. The graphic below illustrates further some of the groupings that exist on just this one topic – riding patterns – including a trend toward increased riding mileage running from bottom left (Car Rejecters) to top right (Performance Disciples). Similar patterns and structure can be identified across a range of different variables.

Figure 9 – Patterns in riding behaviour



The pattern-breaker in many cases remains Segment 4, the Look-at-me enthusiasts. The positioning of this segment at 'top right' of the structure marks the fact that it shares with Segment 2 a relatively high level of passion and high interest in performance. But the defining feature of Segment 4, Showing-off, also distinguishes it very strikingly from Segment 2.

Segment 4 is the one segment that cannot sensibly be paired with any other. However, as it constitutes a quarter (24.8%) of the riding population, this is not a problem.

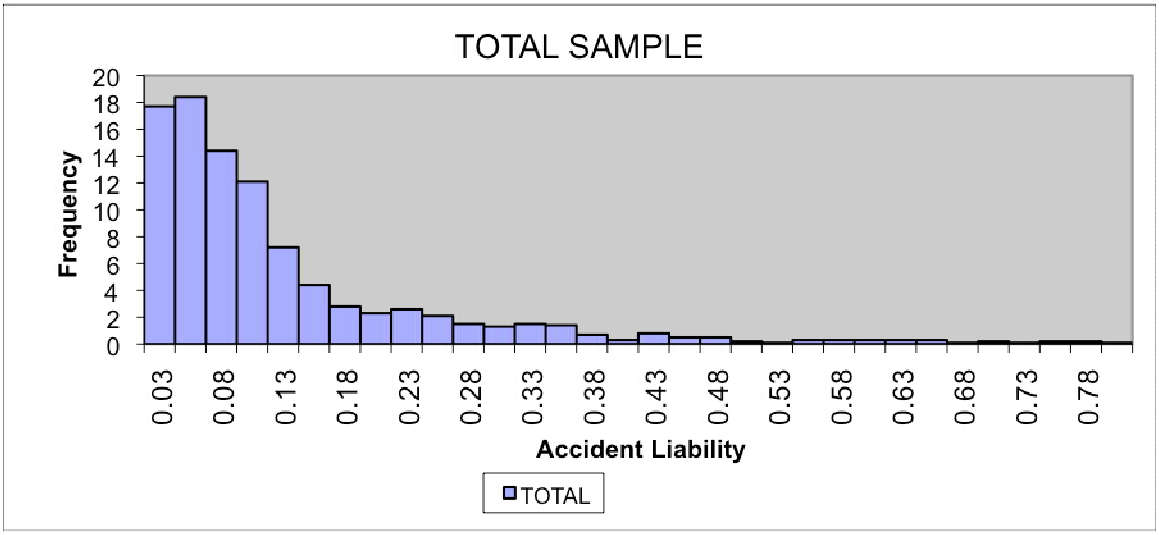
3.3 Risk: reality and perception

3.3.1 Accident propensity

As outlined in Section 2.2.6.2, the questionnaire was designed to collect all the information required to apply TRL's model of accident liability in order to project the likely accident propensity of each segment. (See appendix for full explanation of the model).

This model defines accidents as 'public road accidents (including minor spills) involved in while riding a motorbike on public roads', and projects an average number of accidents per year. So, for instance, an accident liability of 0.1 (0.1 accidents a year) equates to a propensity to have one accident every ten years. The histogram below (Figure 10) shows the distribution of respondents in our sample on this measure.

Figure 10 – Distribution of respondents by accident liability



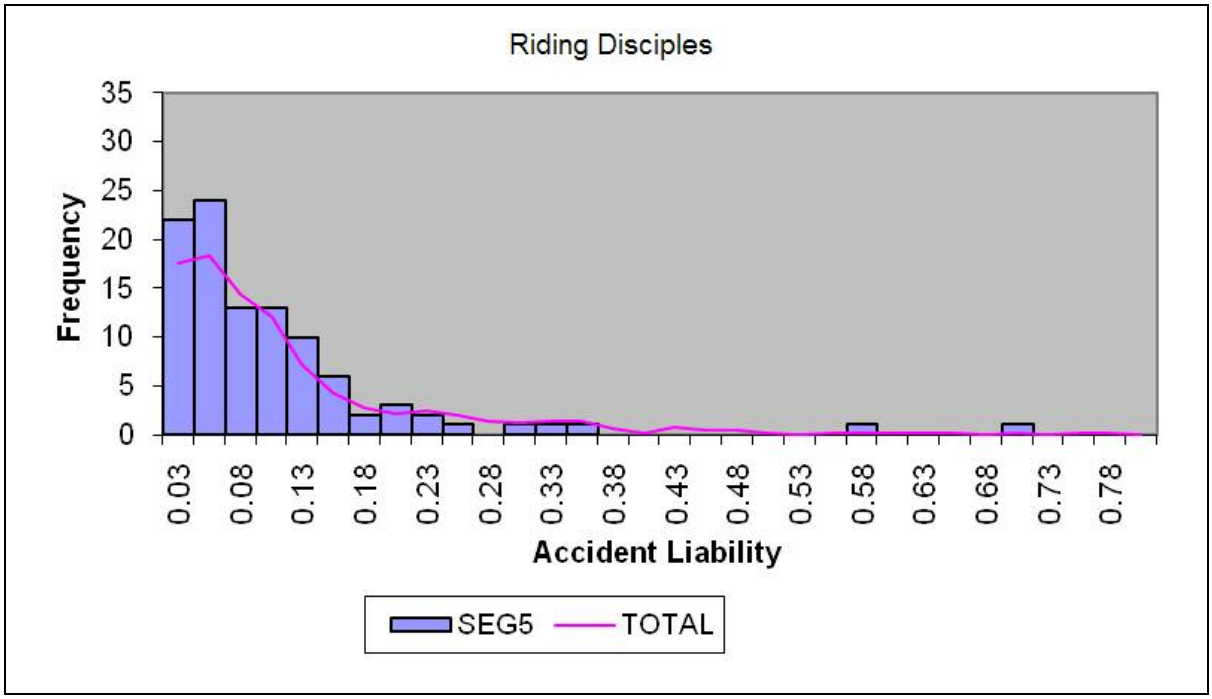
The seven segments show different patterns in their distributions, as the histograms that follow show. Note in particular what appears to be a second 'peak' of higher risk riders in the distributions for segments with a higher interest in performance: Performance Disciples, Performance Hobbyists, Look-at-me Enthusiasts. The same second 'peak' also appears to occur in the two pragmatist segments, especially Car Aspirants.

Figure 11 provides key summary statistics for each segment, namely:

- The mean accident propensity for this segment
- The equivalent 'one accident per x years' figure
- An equivalent 'one accident per x thousand miles' figure, achieved by multiplying the number of years above by the average annual mileage for that segment

Figure 11– Accident propensities

Figure 12 – Distributions of respondents by accident liability: passionate low-performance segments



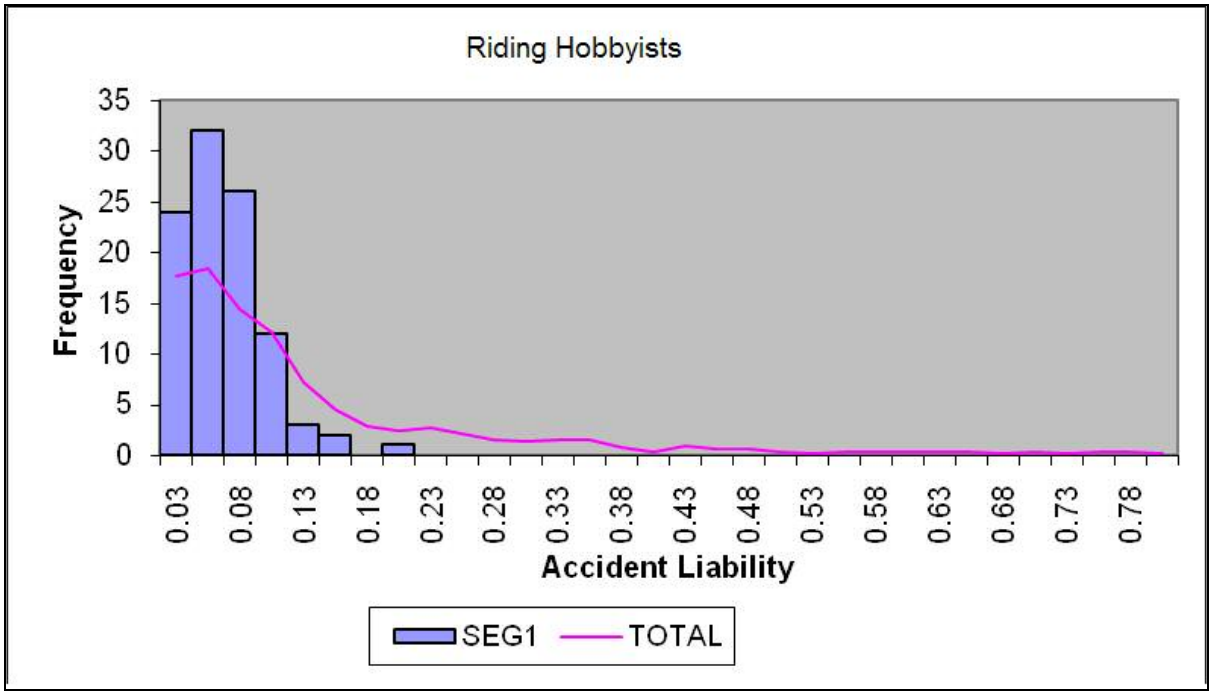
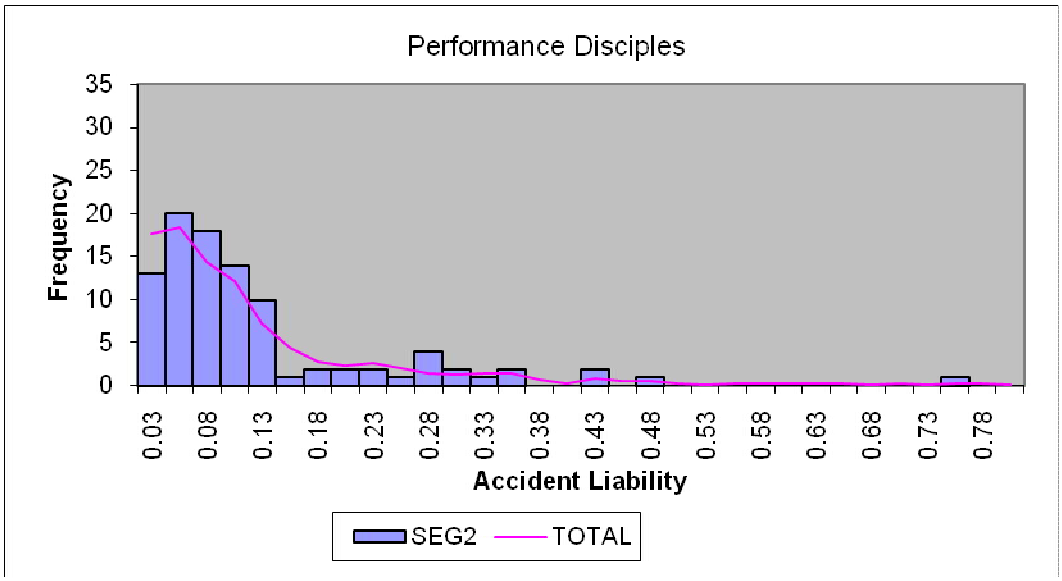


Figure 13 – Distributions of respondents by accident liability: passionate high-performance segments



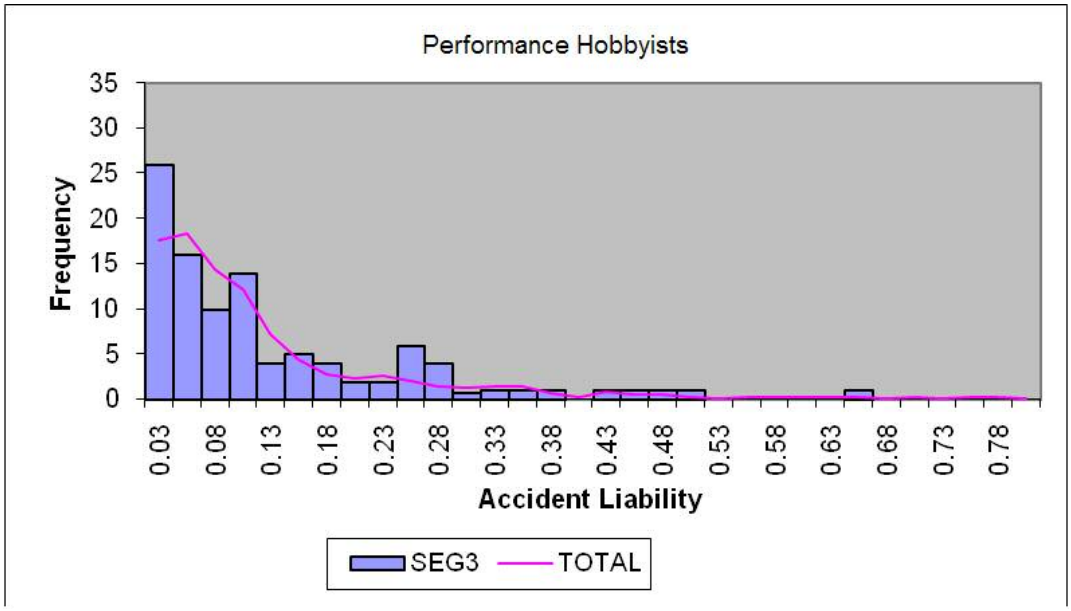


Figure 14 – Distributions of respondents by accident liability: Segment 4

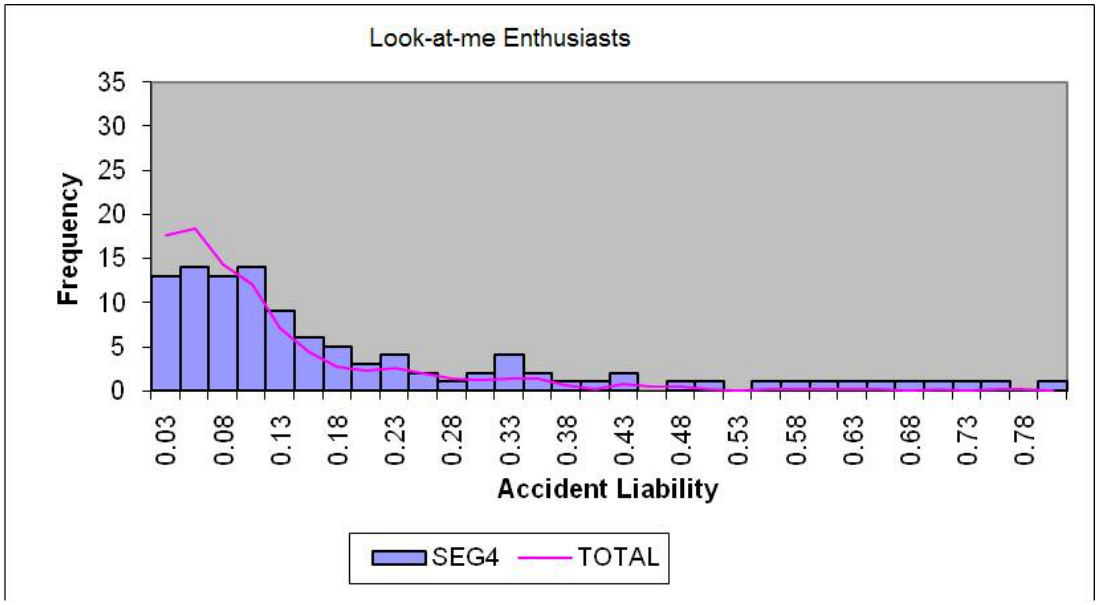
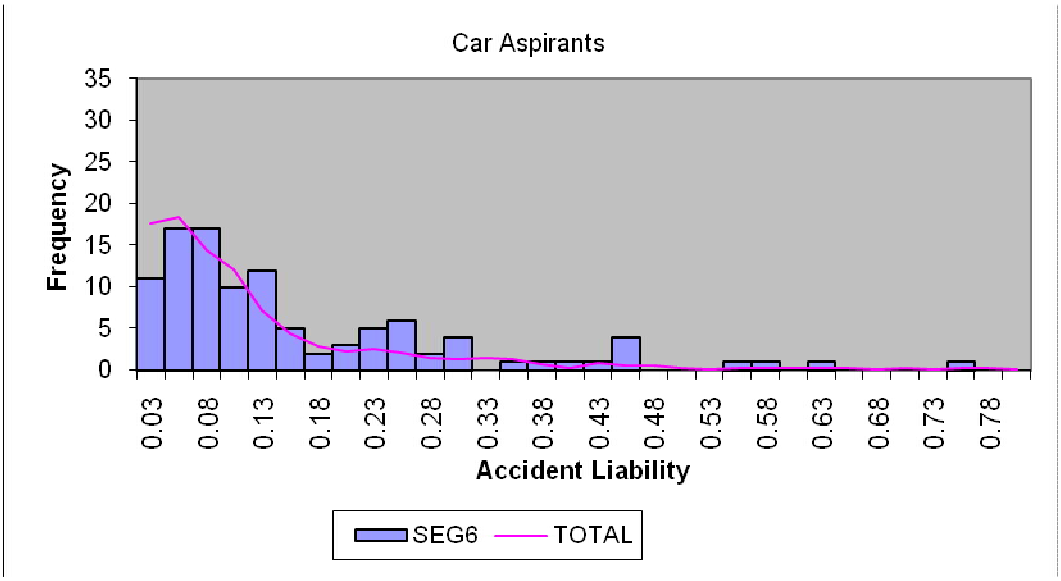


Figure 15 – Distributions of respondents by accident liability: Pragmatist segments



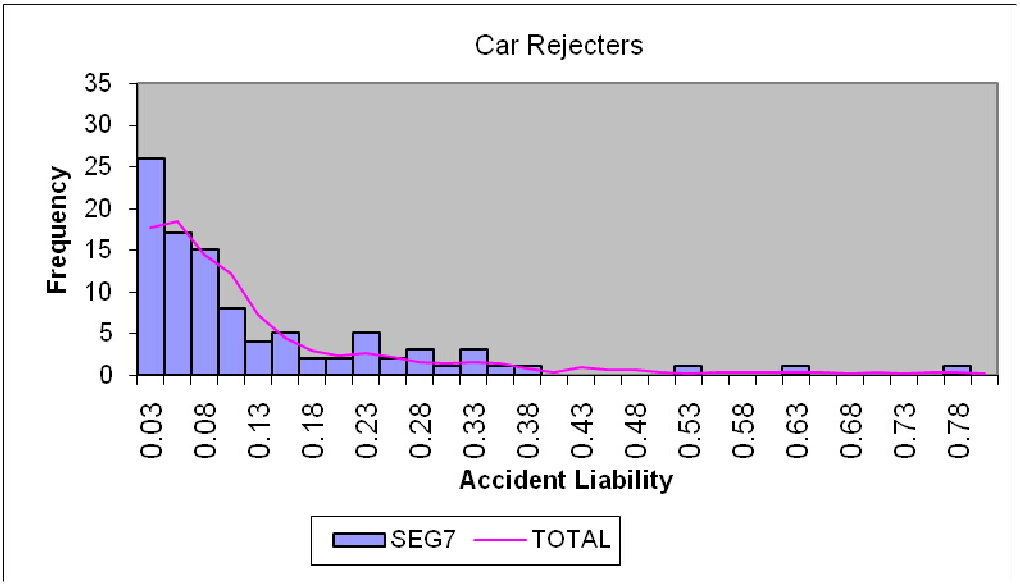


Table 5 summarises these graphs in terms of the proportions within each segment which fall into the four "levels" of accident propensity, based on their liability scores (the horizontal axes in the graphs above). The four levels are defined as: Level 1 - score < 0.05; Level 2 - score between 0.05 and 0.1; Level 3 - score between 0.1 and 0.15; Level 4 - score higher than 0.15. The table also gives the mean liability score for each segment and the numbers in each segment, on which the percentages are based.

Table 5 - Summary of Accident Liability Score Distributions:

Score	Seg. 1	Seg. 2	Seg. 3	Seg. 4	Seg. 5	Seg. 6	Seg. 7	All segs
Level 1	35%	13%	27%	13%	25%	13%	28%	21%
Level 2	49%	39%	27%	26%	36%	30%	30%	33%
Level 3	13%	24%	18%	23%	23%	20%	12%	19%
Level 4	2%	24%	29%	38%	17%	35%	28%	25%
Mean score	0.07	0.14	0.13	0.18	0.10	0.17	0.13	0.13
Not stated	1%	-	-	1%	-	2%	3%	1
Number	145	83	147	248	163	112	101	999

Some clear patterns are apparent in the summary figures.

- On either measure (accidents-per-year or accidents-per-mile), Riding Disciples and Riding Hobbyists have a relatively low accident propensity. Both have mean accident propensity scores significantly lower than the overall mean.
- Performance Disciples have a higher accident propensity, although in part this is because of a higher annual mileage.
- At the other end of the spectrum, Car Aspirants and Look-at-me Enthusiasts have the highest accident propensity on either measure. Both have mean accident propensity scores significantly higher than the overall mean.
- While not as risky, Car Rejecters and Performance Hobbyists also have somewhat higher accident propensities – although lower annual mileages mean they may not have accidents as often as Performance Disciples.

An alternative way of establishing these patterns is to look at the different distributions for each segment. For instance, we can allocate riders to one of four broad categories as follows:

- Low risk riders, with accident liabilities less than 0.1
- Moderate risk riders, with accident liabilities between 0.1 and 0.2
- High risk riders, with accident liabilities between 0.2 and 0.3
- Very high risk riders, with accident liabilities greater than 0.4

Using this approach, employing a wider calibration of the data than previously shown in Table 5, we can identify more precisely the high and low risk rider segments:

- Riding Hobbyists are significantly more likely than average to be low risk riders (a striking 84.7%, against only 55.2% of the total).
- Riding Disciples are significantly more likely than average to be low or medium risk riders.
- Look-at-me Enthusiasts are significantly more likely than average to be medium, high or very high risk riders (with 17.9% in the high risk category, against 9.6% of the total).
- Car Aspirants are significantly more likely than average to be high or very high risk riders.
- Car Rejecters are significantly more likely than average to be low risk riders.

There are, of course some important caveats which need to be made about these accident propensity figures.

The first is that the accidents in question range from the slight to the serious; and we might expect quite different profiles of accident seriousness in the different segments. For instance, while Car Aspirants have a very high accident liability, the type of riding they are doing and the type of bikes they are riding make it reasonable to speculate that a large proportion of these accidents may be the 'minor spills' included in the model. Performance Disciples, by contrast, when they have an accident, may be more likely to have a high speed crash with serious consequences. It should be stressed, though, that these particular examples are based on common sense rather than any actual evidence: the point is that the model does not tell us how serious the accidents in each segment will be.

The second is that the consequences of accidents, however severe, will depend on the precautionary measures riders have taken – most obviously the gear they are wearing – and that these two vary significantly between segments. To continue the example used above, Performance Disciples are significantly more likely than the average to wear armour, including back armour, which will provide protection in more serious crashes; whereas Car Aspirants are significantly less likely than average even to own protective jackets, trousers or boots, and may therefore be vulnerable even in 'minor spills'.

The third and final caveat – which is also the starting point for the rest of this section of the report – is that riders, in line with all other human beings, base their decisions not on actual risks but on their *perception* of those risks. The worrying thing about Look-at-me Enthusiasts, for instance, is not just the fact that they have a high accident liability, but the fact that in our survey they were also significantly more likely than the average to rate themselves as very or quite safe as riders.

Nor is the difference between perception and reality merely a matter of a mismatch between two numbers. Perceptions of risk concern not just the scale of risk, but also what that risk *means* to individuals, how they interpret it, and how (and whether) they therefore respond to it.

3.3.2 Perceptions of risk

In this section, we endeavour to provide descriptions of the ways of thinking about risk that appear to characterise each segment. As will be seen, these descriptions are based on a degree of interpretation which may not be to the taste of all readers. It should also be remembered that all the patterns identified represent points of differentiation from the mean: for instance, when we describe a segment as having a 'fatalist' outlook, that means that the segment is more fatalist in its outlook than the sample as a whole.

Perceptions of risk were tackled explicitly at a number of points in the questionnaire. For instance, can recalibrate the accident liability bands, and respondents were asked to rate the safety/'riskiness' of motorcycling in general and of themselves as riders *twice*, once nearer the beginning of the questionnaire and a second time towards its end. Respondents were also presented with a statistic relating to the risks faced by riding, and asked to indicate their level of agreement with the following statements:

- The risk is something I am willing to live with.
- Life without risk would be boring.
- I am a good rider so the risk does not apply to me.
- I wear protective clothing and so reduce the risk of injury.
- My primary purpose in riding is to arrive safely.
- If the risk is that high I would consider giving up riding.
- I am constantly thinking about the risks when riding my motorcycle.

The topic of risk was, however, implicitly a theme in many of the questions posed; and in this section we have attempted to bring together as many different takes on the topic as possible.

Unless otherwise stated, all the differences cited are significant at the 95% confidence level. In this section, however, we have taken the decision to mention some differences which are only significant at the 90% confidence level. In every case these are clearly labelled as such.

3.3.2.1 Riding disciples (segment 5)

The attitude of this segment of riders to risk can perhaps best be described as one of **active management of risks** as part of the riding way of life.

"You couldn't enjoy it if you didn't do everything in your power to make yourself safe. I would say this as well: a well-ridden motorbike is actually safer than a well-driven car. Or at least, you've less chance of having an accident. What you can't get away from, of course, is that if you do it's going to hurt. Most probably." [M, 45, 600cc]

They are significantly more in agreement than average with "My primary purpose in riding is to arrive safely" (86% strongly agree against 75% of the total sample) – and significantly more likely than riders in general to *strongly* agree with "I am constantly thinking about the risks when riding my motorcycle. They are also significantly less likely than riders in general to ride after a few too many drinks the night before (83% would definitely not do this against 75% of the total sample) or with a minor fault on their bike.

Safety gear plays an important part in these riders' management of risk. They are significantly more likely than riders in general to strongly agree with "I wear protective clothing and so reduce the risk of injury", and also significantly more hesitant than riders in general about riding after dropping their helmet on a hard surface.

3.3.2.2 Riding hobbyists (segment 1)

Riding Hobbyists have an attitude to risk which is superficially quite similar to that of Riding Disciples, in that they emphasise the rider's **personal responsibility for avoiding risk**.

The important difference is that, while Riding Disciples seek to manage the risk that comes with their way of life, Riding Hobbyists (who ride much less and with less commitment) seek to avoid it altogether. For instance, they are significantly more hesitant than riders in general about riding or continuing to ride in a range of potentially risky situations:

- after riding for an hour or more
- after a hard day's work or in a rush
- after drinking a strong coffee or caffeine drink to wake up
- with a minor fault on the bike
- only wearing T-shirt, shorts and trainers.

They are significantly less in agreement than riders in general (including Riding Disciples) with "Life without risk would be boring" and "I am a good rider so the risk doesn't apply to me".

The Riding Hobbyist focus on responsibility is apparent in the fact that they are significantly more likely than riders in general to attribute the high rate of fatalities among riders to "irresponsible riding".

3.3.2.3 Performance disciples (segment 2)

In contrast with the previous segments, Performance Disciples exhibit what might be called a **precautionary fatalism** about the risk of accident in pursuit of high performance.

"The last time I came off my bike was 2001, so 2001 was the last time I came off at 60 miles an hour when a woman pulled out on me. Now, the clock's ticking because I will come off my bike at some point in the future. And you need to keep that at the front of your mind, so you've got to ride to the best of your ability, you've got to wear your kit, because I don't know when I'm coming off my bike again. Police motorcyclists are the best in the country, you hear about them having fatalities, so you can plan all you want but the plan doesn't always work. So what I'm saying is, always ride and think to yourself, right, what I'm wearing, my bike, is it roadworthy, is this kit going to protect me?" [M, 39, 650cc]

In stark contrast to Riding Disciples, they are significantly *less* in agreement than riders in general with "My primary purpose riding is to arrive safely" and "I am constantly thinking about the risks when riding my motorcycle". They are however significantly more in agreement than riders in general with "The risk is something I am willing to live with" – indeed, 72% of them strongly agree with this statement (against 58% of the total sample). Compared to riders in general, they claim that seeing a serious accident involving a motorcyclist is significantly less likely to have an impact on whether they ride or not: 36% say it would have no impact at all (against 25% of the total sample).

These attitudes do not seem to be in any way a result of overconfidence. Performance disciples are significantly less likely than average to rate motorcycling as very or quite safe and they appear to be more likely to rate themselves as very or quite risky (although the last result is significant only at the 90% confidence level).

This estimate of the risks of motorcycling may reflect their own experiences, as they are significantly more likely than riders in general both to know someone who had a motorcycle accident involving serious injury or death (51% against 37% of total sample)

and to have had an accident themselves requiring medical treatment (18% against 11% of total sample).

Unlike Riding Hobbyists, however, recognition of the risks of riding does not appear to constrain the behaviour of performance of disciples. They are significantly less hesitant than riders in general about riding or continuing to ride in a range of potentially risky situations:

- when potentially fatigued (after riding for a long time or distance, a bad night's sleep, or a hard day's work)
- after having a strong coffee or caffeine drink to wake up
- when angry, upset or in a rush

They are also significantly more likely than average to admit they have ridden when too tired during the last 3 years.

The response of Performance Disciples to risk seems to focus primarily on safety gear – they are significantly more likely than average to have armour, including back armour – and improving one's skills as a rider – they are significantly more likely than riders in general to have undertaken or be actively considering advanced rider training (IAM, RoSPA or BikeSafe), and appear more likely than average to offer lack of training as a first explanation of high fatalities among riders (although the last result is significant only at the 90% confidence level).

3.3.2.4 Performance hobbyists (segment 3)

Compared to the three segments discussed above, the pattern for Performance Hobbyists is less clear, as on many points their attitudes are not significantly different from the average for riders in general.

Like Performance Disciples, there is some indication of an acceptance of risk as part of riding. For instance, compared to riders in general, they claim seeing a serious accident involving a motorcyclist is less likely to have an impact on whether they ride or not: 31% say it would have little impact (against 24% of the total sample: for both Performance Disciples and Performance Hobbyists a total of 60% say seeing an accident would have little *or* no impact, against 49% of the total sample).

Unlike Performance Disciples, however, they are not more likely than average to see this risk as something to "live with". Instead, Performance Hobbyists appear to be more in agreement than average with "Life without risk would be boring" (although this result is significant only at the 90% confidence level). This fits with the broader motivational difference between the two segments: for Performance Disciples, performance is an end in itself, and risk therefore something that gets in its way; for Performance Hobbyists, performance is a means to pleasure, and the thrill created by risk is an element of that pleasure.

Perhaps as a result of this approach to risk, Performance Hobbyists are significantly more likely than riders in general to admit to having overestimated their abilities or taken risks to impress others during the last three years.

Despite these admissions, there are signs of caution in the Performance Hobbyists' responses. In particular, they appear to be less in agreement than average with "I am a good rider, so the risk does not apply to me" (although this result is significant only at the 90% confidence level). They are definitely less in agreement with this statement than the Look-at-me Enthusiasts, the other segment which – as we shall see shortly – considers life without risk boring.

As noted above, the picture for Performance Hobbyists is less clear than for other segments. On balance, however, their attitude to risk appears to be one of **cautious attraction**.

"Most people ask the question, why would you want to go out on a bike on modern day roads and things like that? Well, you have to make that decision. Do I want to closet myself away, or do I want to try and enjoy myself? Something I absolutely love and like to do." [M, 30, 1000cc]

3.3.2.5 Car aspirants (segment 6)

As with Performance Hobbyists, the pattern of risk perception is less clear among Car Aspirants than in some other segments. There is some evidence, however, that this may be because members have given the risks of riding less thought than some other segments.

"Oh, I can't say I think about crashing. If I'm riding, I'm not really thinking about what if this happens or… I just ride." [F, 18, 50cc]

The most striking finding in this respect concerns a change in perceptions of the risk of riding during the course of the research interview itself. In general, riders tended to rate themselves personally as riskier when asked a second time at the end of the interview (see Section 3.3.3 for further discussion). Car Aspirants stand out as the only segment which sees a significant fall in ratings of personal safety between the two questions – alongside a similar significant fall in their ratings of the safety of motorcycling in general. A very limited amount of information and engagement seems to make Car Aspirants significantly more risk-conscious than they were before. (In line with this, Car Aspirants also appear to be the riders who would be most hesitant about riding after seeing a serious accident involving a motorcyclist, although this result is significant only at the 90% confidence level).

This low 'resting awareness' of risk may reflect the short riding careers Car Aspirants have had, and in particular the fact that they are significantly less likely than average to know someone who had a motorcycle accident involving serious injury or death. Car Aspirants also have a very low exposure to informal sources of safety information, such as specialist websites, magazines, dealers, etc. Interestingly, Car Aspirants may be conscious of this lack of experience themselves: when asked about the reasons for the high level of rider fatalities, they are significantly more likely than other segments to offer lack of training as either their first or second reason.

While Car Aspirants may not think about the risks of riding, they do not appear in any way cavalier about them. They are significantly less in agreement than riders in general with "I am a good rider so the risk does not apply to me", and significantly less likely than average to rate themselves as very or quite safe. Risk does not carry any thrill for them either: they are significantly less in agreement than average with "Life without risk would be boring".

The combination of a low 'resting awareness' of risk with a tendency to take risk seriously when they do become aware may explain some otherwise puzzling patterns in Car Aspirants' reported behaviour. On the one hand, they appear to be more likely than average to consider riding in jeans and T-shirt (although this result is significant only at the 90% confidence level). On the other hand, they are significantly more likely than average to say they would definitely not ride after dropping their helmet on a hard surface (43% against 31% of total sample). It would seem that messages about the risks attached to a dropped helmet have reached this audience more effectively than messages about safety gear.

On balance, the attitudes of Car Aspirants to risk may be described as **low awareness but high educability**.

3.3.2.6 Car rejecters (segment 7)

Car Rejecters share Car Aspirants' dislike of the risks attached to motorcycling, but appear to have a higher 'resting awareness' of those risks. Their attitude can be described as **high awareness and high unhappiness**.

"I suppose it comes into this feeling of safety and feeling cocooned in the car, and I don't on the bike. […] And I suppose because of lack of experience, I don't feel confident, no. If I had the years of experience everybody else has, perhaps I might have a different view." [M, 44, 250cc]

They are significantly more likely than riders in general to rate motorcycling as very risky (first time round – see below), and significantly less in agreement than average with "Life without risk would be boring" and "The risk is something I am willing to live with".

They are also unlikely to exclude themselves from these risks, being significantly less in agreement than riders in general with "I am a good rider so the risk does not apply to me". They also appear to be more likely than riders in general to rate themselves personally as very risky, and more in agreement with "I am constantly thinking about the risks when riding my motorcycle" (although both these results are significant only at the 90% confidence level).

While the mere fact of taking part in a 30 minute survey about riding risks appears to increase the risk-awareness of Car Aspirants, there are some signs that it may have served to reassure Car Rejecters. As noted above, they are significantly more likely than riders in general to rate motorcycling as very risky on the first asking. By the second asking, however, they are significantly more likely than riders in general to rate it as very safe. The numbers involved here are small, however, and reflect changes in the responses of other segments as much as the responses of Car Aspirants (the increase in the average rating of motorcycling risk in the segment is not in itself statistically significant).

3.3.2.7 Look-at-me enthusiasts (segment 4)

Look-at-me Enthusiasts exhibit a pattern of attitudes toward risk which might without injustice be described as **blasé confidence**.

They are significantly less likely than the average to rate motorcycling in general as very or quite risky – but significantly more likely than the average to rate themselves personally as very or quite safe. They are also significantly more in agreement than riders in general with "I am a good rider so the risk does not apply to me". To the extent that they do acknowledge risk, they seem to have an even stronger attraction to the thrill elements than Performance Hobbyists, being significantly more in agreement than riders in general with "Life without risk would be boring".

There are also some grounds for thinking that these attitudes may be less susceptible to change than some other segments (such as Car Aspirants). On the first asking of the question, Look-at-me Enthusiasts gave themselves personally a high mean safety score but not one that was significantly higher than the mean for the sample as a whole. On the second asking, the sample as whole shows a significant decline, but the Look-at-me Enthusiasts mean score appears to 'hold up', so that it is now significantly higher than the mean.

Look-at-me Enthusiasts' attitudes to risk carry through into their riding behaviour. They are significantly less hesitant than riders in general about riding after a few too many drinks the night before, or wearing only T-shirt and jeans – although it should be stressed that, even in this segment, those who would consider doing so remain a minority (65% and 66% of the segment say they would definitely not ride in each case: but this is compared to 75% and 76% of the total sample). They are also less hesitant than riders in general about riding with a minor fault on their bike.

"I think I'm a good driver, but I don't have the protective gear and stuff. For my own safety, it's no problem." [M, 16, 50cc]

Asked about the reasons behind the high level of rider fatalities, members of this segment appear less able than average to identify more than one reason (although this result is significant only at the 90% confidence level). This would fit with a degree of 'blaséness' about risk. Interestingly, however, they also appear more likely than average to single out lack of rider concentration as a cause of fatalities (although again this result is significant only at the 90% confidence level) – suggesting some awareness of risks to which other responses suggest they may be liable.

A further pattern in the explanations of fatalities offered by riders in this segment is even more promising. While they appear to be less likely than riders in general to offer a reason inside the rider's control as their *first* explanation of riding fatalities (90% only), they are significantly more likely to offer a reason inside the rider's control as the *second* reason. (They were overall, significantly more likely than average to offer the combination of a first reason inside and second reason outside the rider's control). Given that this segment more than any would appear to be the one that needs to attend to risk factors arising from riding behaviour, this result suggests that more sustained efforts to engage Look-at-me Enthusiasts in thinking about risky behaviour may pay off. We would recommend further research to investigate these suggestive results.

3.3.3 Changing perceptions of risk

Perceptions of risk are almost certainly not stable over time. They can be changed by education, by experiences, and by deeper changes in outlook as an individual matures. Even during a thirty minute questionnaire which was *not* designed to change attitudes, changes in risk perception were apparent, with the sample as a whole showing a statistically significant lowering in the mean rating of personal safety as a rider. This finding should be a source both for optimism – that attitudes to risk can be changed – and concern – about the permanence and real impact on behaviour of changes in reported attitudes which are so easily achieved.

It is also clear that those seeking to change perceptions of risk need to take account of the ways in which any given segment already thinks about risk, and their wider motivations for riding. In Section 3.4 we discuss further the application of these findings to the specific policy issues we investigated; but a single example will help to make the general point here.

So, for example, consider the attitudes of two segments – Riding Hobbyists and Performance Disciples – to safety features on bikes. When asked to identify, unprompted, the main factors other than price that would affect their choice if they were to buy another motorcycle, the two factors identified most frequently by Riding Hobbyists were comfort and brand name/make; for Performance Disciples, the two most frequently identified factors were looks and speed. The differing motivations of these two groups are immediately apparent in these choice factors. What is striking, however, is where safety (or safety features) occurred in the list of factors offered unprompted by each segment. For Riding Hobbyists, safety was the 7th most frequently offered factor. For Performance Disciples, it ranked 24th – which is to say that only one person in this segment offered it as the main feature. (However, see Section 3.4.1 for a note of caution about the interpretation of these rankings.)

Why might this be? The discussion of risk perceptions in the last section suggests a plausible explanation. Riding Hobbyists, it was noted, focus on personal responsibility for avoiding risk: and safety features on bikes are therefore likely to appeal to them as sensible ways of decreasing the likelihood of accident. Performance Disciples, by contrast, adopt a more fatalist attitude to the occurrence of accidents, and focus on measures (such as armoured gear) which can reduce the severity of the consequences when accidents do occur. Moreover, in line with their overall focus on performance

(including personal performance), they emphasise the role played by the skills of the rider in reducing the risk of fatality. Conceivably, safety features on a bike may even be experienced by this group as getting in the way of performance.

An analysis of this kind is important for two reasons. First, it helps us to identify a key audience for a particular kind of safety message: safety features on bikes need to be 'sold' to Performance Disciples in a way that they do not need to be sold to Riding Hobbyists. Secondly, it points to practical solutions which respect (in so far as is possible) the motivations and attitudes of that target audience. In this case, for instance, it would make sense to explore ways of positioning safety features on bikes as things that reduce the severity of accidents (in the way that armour does) as well as their likelihood. It might also make sense to emphasise the ways in which such features still require skilful riding if they are to have a positive effect, or even to create advanced training options specifically focusing on the skilled use of such features.

An understanding of the motivations and risk perceptions of each segment can be a powerful tool both in identifying target audiences for key policy interventions and generating possible implementation strategies. Section 3.4 looks in more detail at some of the issues surrounding riders' choice (and use) of bike, helmet and safety gear, and their treatment of the issue of fatigue.

Before leaving the topic of changing perceptions of risk, however, it is worth commenting on the role that may be played by deeper changes in outlook as an individual matures – as this was something that riders themselves commented on in the qualitative phase of work.

The issue is of most relevance to discussion of Look-at-me Enthusiasts, the segment which combines a high proportion of young riders with a high likelihood of continued riding. (Car Aspirants, by contrast, are likely to 'graduate' to cars as soon as age and finances allow.)

We noted in Section 3.2.4.4 our belief that Look-at-me Enthusiasts may mature into members of the other high passion segments, with a more settled motivational profile – based in part on the testimony of riders in those other segments in our qualitative work. The analysis of risk perceptions provides a new take on this idea, by suggesting some possible models for this maturation. It should be stressed again that these ideas are heavily interpretative and go beyond the available evidence. However, we believe that more research into these topics could be valuable, as Look-at-me Enthusiasts clearly represent a priority from a safety point of view, and interventions which 'co-opt' existing mechanisms of 'maturation' seem more likely to be successful.

The point can be made simply by considering the differences between the risk perceptions of Look-at-me Enthusiasts and three other segments which share their high passion, high interest in performance, or both – but which tend to have much more experience of riding.

1. Look-at-me Enthusiasts vs Performance Hobbyists

What they have in common	Both segments are attracted to the thrill of riding, with above average agreement with "Life without risk would be boring".
Where they differ	Performance Hobbyists show a much lower level of confidence in their own abilities. For instance, they have below average agreement with "I am a good rider so the risk does not apply to me". Look-at-me Enthusiasts have above average agreement with this statement.
Plausible 'maturation mechanism'	Performance Hobbyists are significantly more likely than average to admit to having taken risks showing off in the last three years. Yet it is Look-at-me Enthusiasts who are high on the showing off motivation factor. Why are they not admitting to taking these risks? One plausible

response is that Look-at-me Enthusiasts do not yet see their behaviour as risky. One way in which this might change is through a near miss or lucky escape – which might both recalibrate their sense of personal risk and make them more willing to admit that what they did was risky.

"I just didn't think about it enough. Well, I did think about it. It was: I'll be alright this once. And it wasn't. That's sod's law." [M, 38, 600cc]

2. Look-at-me Enthusiasts vs Performance Disciples

What they have in common	Both segments share a keen interest in the performance aspects of riding, and a willingness to ride in potentially risky situations.
Where they differ	Where Look-at-me Enthusiasts show a bias to rating motorcycling and themselves as safe, Performance Disciples show a similar bias to rating motorcycling and themselves as risky. For Performance Disciples, this risk is something they are "willing to live with": Look-at-me Enthusiasts show a stronger bias to agreement with "Life without risk would be boring".
Plausible 'maturation mechanism'	Compared to Look-at-me Enthusiasts, Performance Disciples seem to have acknowledged and accepted the risks of riding. Their response, however, does not seem to lie in their riding behaviour. Instead, they take precautionary measures (such as wearing armour). One possible reason for this 'fatalist' response may be that it is a reaction to the experience of serious motorcycle accidents, either indirectly through friends or directly.

"I've been here for Donkey's years now. I've had a lot of mates killed. I don't think I ever made a conscious decision that I'm going to wear that. It was just a progression thing. […] I didn't used to use the [leathers] on the road. But I've lost several mates, 14, 15 mates died on bikes, and it's not funny." [M, 52, 1000cc]

3. Look-at-me Enthusiasts vs Riding Disciples

What they have in common	Superficially very different, both segments in fact share a higher than average agreement with "I am a good rider so the risk does not apply to me."
Where they differ	Unlike Look-at-me Enthusiasts, the confidence of Riding Disciples rests in active management of risks through a clear focus on safety and a range of behavioural measures. For instance, 83% of Riding Disciples say they would definitely not ride after a few too many drinks the night before, compared to only 65% of Look-at-me Enthusiasts.
Plausible 'maturation mechanism'	Somewhere along the way in their relatively long riding careers, Riding Disciples seem to have recognised that their claims to personal safety need to be based on actual safety practice. Given the emphasis placed by this group on riding as a way of life, it seems plausible that 'peer pressure' from the wider riding fraternity may have exerted a positive influence here.

"A full set of leathers basically because you're out all day. You do get sweaty and all that, but it's a sacrifice you make for your safety basically. And you do get frowned upon if you wear like nothing. […] because the majority do wear the right kit. [M, 42, 750cc]

Of course, the unfortunate fact remains that some riders do not get the chance to change their perceptions of risk in response to exposure to accidents or peer pressure, because they themselves have a fatal accident. By definition, this is a population that never features in surveys. Even if our hypothesis is correct, and Look-at-me Enthusiasts do mature into other types of rider with lower accident propensities, this is clearly no cause for complacency when the 'maturation mechanisms' mean some riders don't mature at all.

3.4 Rider decisions

Understanding the different motivations and perceptions of risk in different groups of riders is important because it allows us to understand and positively influence key decisions which they make which have a bearing on their accident risk and/or the consequences of accidents when they do occur.

In this section, we explore the implications of the findings of this study for the specific policy issues investigated.

The first key area of focus was to understand more about riders' decisions in purchasing (and using) motorbikes, helmets and other safety gear. In fact, it is useful to distinguish two separate questions here:

- How important is safety in riders' choice of bikes, helmets and safety gear? Section 3.4.1 looks at the evidence from this survey, with special attention to the importance of safety features in the choice of bike.
- How do they make judgements about what is safe enough? Sections 3.4.2 looks at the evidence from this survey, with special attention to patterns of safety gear ownership and issues around helmet certification.

The second key area of focus was on fatigue. Section 3.4.3 looks at the evidence from this survey on this topic.

3.4.1 Choosing a bike: how important is safety?

The data around factors in the choice of a bike provide a good example of the general challenges of interpretation that arise in a study such as this. Respondents were asked two questions on this topic. The first was an unprompted question, to which one or more answers were recorded and coded.

> Q22: If you were to buy another motorcycle tomorrow, what would be the main factor other than price that would affect your choice of motorcycle?

The second invited respondents to rank the importance of a predefined list of potential factors in the selection of a motorbike.

> Q23: Can I just ask how important these factors are in your choice of a motorcycle?
>
> - Engine size/power
> - Acceleration
> - Comfort
> - Looks
> - Sound/noise it makes
> - Reliability
> - Manufacturer/brand reputation
> - Safety features

- Recommendation from trusted sources
- Fuel consumption
- Manoeuvrability

Two key interpretative questions arise when looking at responses to these questions.

The first question concerns the relation between prompted and unprompted responses: put crudely, which is more revealing? For example, on the prompted question reliability scored the highest mean importance score in every one of the seven segments as well as the sample as a whole. Yet it was only the sixth most frequently rated factor in the unprompted list, and only occurred in the top two for one segment (Car Aspirants).

What is going on here? One possibility is that when respondents give unprompted answers, they focus on the things that they think differentiate bikes and tend to discount those factors which they assume will be more standard between bikes. For instance, you may consider reliability the most important feature of a bike, yet assume that most bikes you look at will be reliable, making it a less important factor in your actual decision-making process. The mere possibility of this explanation throws some doubt on how best to interpret the observation made earlier that 'safety features' were the 7th most frequently given unprompted factor for Riding Hobbyists but 24th for Performance Disciples. Does this mean that Performance Disciples are less interested in safety features, or that they are more likely to take it for granted that the bikes they are looking at will have state of the art technology? There is an equally convincing story, after all, that attributes Riding Hobbyist's concern for safety to their interest in older classic bikes on which the safety standards may be more in question.

The only solution here is to proceed with caution, exploring prompted and unprompted responses next to each other. The fact that Performance Disciples also gave safety features the lowest mean importance score of any of the ten factors offered supports the interpretation that these riders are not looking for safety features, versus the interpretation that they may be taking them for granted.

The second question concerns the relative value of looking at rank orders and significant differences from the total sample. To take another example, on the prompted question both Car Aspirants and Car Rejecters place significantly greater emphasis than riders in general on fuel consumption. In terms of rank order, however, based on mean importance scores, fuel consumption ranks fourth out of ten for each segment, after reliability, comfort and manoeuvrability in traffic. Statistical differences are the things that help us to understand the differences between different segments' decision-making priorities; but as a result, they may lead us to overlook the things which segments all value in common.

In some cases, statistical differences may even appear at first sight to contradict the rank order. For instance, the mean importance score for reliability for Riding Hobbyists is significantly less than the mean for riders in general; yet reliability still gets the highest mean score for any item among the Riding Hobbyists (whose scores are in fact significantly lower than riders in general on six of the ten factors).

The key here is to remember that statistical differences illuminate the ways in which different motivations play out in the decision-making processes; but rank orders may provide a better guide to the actual factors that will drive purchases.

With these caveats in mind, Figure 16 sets out some of the key findings for each segment, namely:

Top three unprompted factors in bike choice.

- Position of safety features in i) unprompted ranking and ii) prompted ranking.
- Factors mentioned significantly more often than average in unprompted responses.

Figure 16– Factors in bike choice

Reviewing this evidence in the light of previous discussions of rider motivation and risk perception, we draw the following conclusions.

1. Car Aspirants, Car Rejecters and Riding Hobbyists are the segments most open to considering safety features in their selection of a bike.
2. Riding Disciples, in line with their active management approach to risk, are open to the importance of safety features on bikes. However, the low ranking in unprompted mentions (only 4 out of 163 riders mentioned it) suggests that features are not currently seen as part of the risk-management repertoire by these riders. There is clearly scope here to work with Riding Disciples to understand how safety features on bikes can become as much a part of their way of life as safety gear already is.
3. For Performance Hobbyists, some demonstration of the importance of safety features on bikes may be required as well as awareness raising. Given the emphasis placed by this segment on the experience of riding (and the attraction they seem to show to the thrill of risk) messages may need to emphasise ways in which safety features enhance that experience rather than diminishing it. However, in light of the fact that this segment is generally disconnected from riding circles, and is also significantly more likely to buy a bike second hand (74% against 65% of the total sample), it may prove hard to get these messages out.
4. For Look-at-me Enthusiasts too, some demonstration of the importance of safety features on bikes may be required as well as awareness raising. The challenge here will be to make safety compete in their decisions with other priorities, such as looking good and being able to go faster than other people. Given the blasé confidence exhibited by these riders, this effort will almost certainly need to go hand in hand with a wider effort to get Look-at-me Enthusiasts to take on board safety issues.

   "It's more because of my age, so when I go into a showroom when I've passed Direct Access I'll be going for the speeds and how it looks as opposed to necessarily how safe it is. It's probably just an age thing. As you get older you start to focus a lot more on: if I come off what is going to save me, how can I help myself. When you're younger it's just: how can that get me from here to London in ten seconds." [M, 25, 125cc]
5. Performance Disciples will probably prove the hardest audiences to convince of the merits of safety features on bikes, with a mean importance score significantly below riders in general and only 1 rider (out of 83) mentioning safety features unprompted as a factor in bike choice. It seems plausible that the issue here may be a perceived competition between safety features and performance. As discussed earlier, it may make sense here to explore ways of positioning safety features on bikes as things that reduce the severity of accidents (in the way that armour does) as well as their likelihood. It might also make sense to emphasise the ways in which such features still require skilful riding if they are to have a positive effect, or even to create advanced training options specifically focusing on the skilled use of such features.

3.4.2 Choosing safety gear/helmets: how safe is 'safe'?

Helmets and safety gear differ from motorcycles in that their primary purpose is to keep the rider safe, although some clearly choose gear based on looks. Unsurprisingly, therefore, there is much more uniformity in the views of segments regarding the importance of safety in their selection. (It is noteworthy, however, that the preoccupations of some segments are again apparent in the features they mention unprompted for their choice of helmet, with Look-at-me Enthusiasts being significantly more likely than riders in general to mention looks or colour; Performance Disciples more likely to mention noise reduction and weight; and Riding Hobbyists more likely to mention an open-face design).

Where the real differences emerge between segments is in their estimation of what counts as adequate safety. For instance, Table 6 below shows levels of ownership of different types of safety gear across the total sample. Figure 17 shows how preferences for different types of gear vary between the segments.

Table 6– Levels of gear ownership in total sample

ALL RIDERS	Leather	Textile	Armour	None
Jacket	50%	40%	48%	10%
Trousers	46%	35%	34%	19%
Boots	71%	8%	28%	21%
Gloves	75%	15%	30%	10%
Back armour	-	-	30%	70%

Figure 17 – Gear preferences: significant differences from average levels of ownership among those who own any protective gear

Car Aspirants emerge very clearly from this comparison as the segment with least safety gear. This may reflect any one of a number of factors:

- As we saw in the discussion of perceptions of risk, Car Aspirants may not give much thought to the risks of riding.
- Even if they do give thoughts to the risks, Car Aspirants may underestimate the need for safety gear on the short, urban journeys they typically make – as is perhaps indicated by their relatively high willingness to consider riding in just jeans and T-shirts.
- Car Aspirants, many of whom are young and/or students, may also lack money – meaning the small investments they do make in safety gear seem more substantial to them.
- Given that they may not intend to ride for very long before graduating to a car, any investment in gear is also for a short time only.

Taken together, all of these factors add up to one thing: a judgement on the part of Car Aspirants that they are 'safe enough' with what they have on. This is not to say that Car Aspirants do not think that safety is important in their choice of gear: in fact, they have the highest mean importance score of any segment for safety/protection certification as a factor in the choice of gear (although it is higher than the mean for all riders only at the 90% confidence level). The issue here is not that Car Aspirants don't care about safety when choosing gear: the issue (if it is an issue) is that they set the bar low in judging what is 'safe enough'.

The question of what is 'safe enough' becomes arguably even more complex when we turn to ownership of helmets. Unlike safety gear, helmets are of course a legal requirement, and one that is now widely accepted – with 97% of riders saying that they wear their helmets every time they ride. Of these:

- 74% wear full-face helmets (most popular with Performance Disciples)
- 12% wear open-face helmets (most popular with Riding Disciples and Riding Hobbyists)
- 14% wear flip-front helmets (most popular with Car Rejecters)

But is any given helmet that is being worn safe? There are a number of factors which could be important here:

The age of the helmet. The average age of the helmets is 2.28 years, and (unsurprisingly) those segments with the shortest riding careers (Car Aspirants, Car Rejecters and Look-at-me Enthusiasts) report the lowest mean age for helmets (although none of these differences are in fact statistically significant).

How well the helmet has been treated – and specifically, whether it has been dropped on a hard surface at any point. 71% of our total sample claim they would not continue to wear their safety helmet if it had fallen on hard ground, with no significant differences between segments. However, a further 12% were not sure, suggesting room for continued education in this area.

Even more strikingly, a rather different pattern emerged later in the same interview when 'having dropped your helmet on a hard surface' was included as one of the scenarios in the following question:

> Q45: In some situations riders may think twice about riding/continuing to ride their motorcycle. On a scale of 1-5, where 1 equals 'would definitely not ride' and 5 equals 'no impact', please indicate how your riding habits may change regarding the following statements.

In response to this question, only 31% of riders said they would definitely not ride, with a significantly higher proportion of Riding Disciples (44%) and Car Aspirants (43%) saying they definitely would not ride. Only by adding in respondents who said they

'would seriously consider not riding' or that this would 'make you think twice' do we arrive at a percentage (81%) that could include all those who responded 'no' to the earlier yes/no question (although this apparently also includes the 'not sure' group as well).

What is going on here? Obviously the second question provides more response options, which is part of the explanation. But it is also important that the questions put the choice in rather different contexts, with the first focusing on 'continuing to wear the helmet', the latter on 'continuing to ride'. It is plausible to suggest that the gap is therefore between 'what I know I should do' and 'what I might actually do if I needed to ride now'. It is less surprising that Riding Disciples hold a clearer line on this issue, but more so that Car Aspirants too do the same.

Origin of the helmet. Given that age and former treatment are important, care is evidently needed with respect to second hand helmets. Car Rejecters are significantly more likely than riders in general to buy their helmets second hand (although it is still only 7% who do so).

Safety certification. 92% of riders stated that safety certification was of great importance as a factor in their selection of a helmet – with the proportion of Car Rejecters (98%) significantly higher even than this high proportion. But which standard? 6% of riders in our sample were not aware of any safety standards or ratings – rising to 9% and 10% among Car Rejecters and Car Aspirants (although, give the small numbers, only the second is statistically higher than the mean, and that only at the 90% confidence level). Table 7 below sets out the 5 standards/ratings which were most likely to be mentioned by those who did know of any, along with the percentage reporting awareness and the segments with significantly higher or lower awareness.

Table 7 – Awareness of helmet safety standards/ratings

Standard	%ge awareness in sample	Segments with significantly higher awareness	Segments with significantly lower awareness
BS (Kite mark)	75%		Car Aspirants (64%)
ACU Gold Sticker	43%	Performance Disciples (55%)	Car Aspirants (33%)
SHARP 5-star	22%		
UN ECE	16%	Performance Disciples (25%)	Riding Hobbyists (10%)
Snell	9%	Riding Hobbyists (15%)	

It is also interesting to compare awareness of standards with the answer to a second open question: which standards does your helmet comply with? (Note: we recognise that the word 'compliance' does not strictly apply to the Sharp 5-star rating.) Assuming that those whose helmets comply are also aware of a standard, this gives us a rough measure of awareness outside those who actually have the standard.

Table 8 – Awareness of vs compliance with helmet safety standards/ratings

Standard	% awareness in sample	% compliance in sample	Difference
BS (Kite mark)	75%	59%	16%
ACU Gold Sticker	43%	41%	2%
SHARP 5-star	22%	6%	16%
UN ECE	16%	13%	3%
Snell	9%	2%	7%

These tables contain some encouraging findings for the SHARP scheme. In particular, given that the scheme was announced in November 2007, and the first ratings posted in June 2008, just before the fieldwork for this study was conducted, the relatively high level of awareness among those who do not have a rated helmet is positive. There are, however, some important challenges for the scheme too:

- In a list of seven possible factors in choice of helmet, the SHARP rating received the lowest mean importance score among the total sample – below factors which included looks, recommendation from a trusted source and the reputation of the manufacturer/brand.
- The SHARP rating was ranked seventh out of seven by all segments apart from Car Aspirants and Car Rejecters – which ranked it sixth (above looks).
- The segment most likely to have a SHARP rated helmet is the Riding Hobbyists (10%) – but this is also the segment which gives SHARP ratings the lowest mean importance score, suggesting the rating may not have been a factor in the purchase.
- Riding Hobbyists are one of two segments with what looks like a pre-existing attachment to another standard (Snell) – the other being Performance Disciples, with clear attachment to ACU and UN ECE. In general, the SHARP rating is clearly facing a 'crowded market' in terms of safety standards and ratings.

Reviewing the evidence presented in this section in the light of previous discussions of rider motivation and risk perception, we draw the following conclusions.

The real challenge in promoting safer gear is not to sell the importance of safety, but to influence perceptions of what is safe enough.

1. Car Aspirants pose particular challenges in respect of their judgements of what is safe enough, not least because they are a transitory riding population with limited budgets and, we believe, a tendency not to think about the risks of riding. However, the strong emphasis placed by this segment on safety suggests that there is real potential for simple, targeted educational messages – such as promotion of the SHARP scheme. There may be a lesson to be learned here from past efforts to communicate the importance of replacing dropped helmets, as this message seems to have reached Car Aspirants very effectively. Promotion of the SHARP scheme may also need to take account of the fact that Car Aspirants are significantly less likely than riders in general to buy their helmet from a specialist dealer (79% against 86% of the total sample).
2. Car Rejecters are another promising target for messages about safety standards, and likely to welcome schemes such as SHARP which facilitate decisions for them. Again, promotion efforts will need to take account of the fact that both pragmatist segments have very low exposure to specialist dealers, press, websites etc.

3. Look-at-me Enthusiasts, which represent nearly a quarter of the riding population, create unique challenges for the promotion of any safety messages. Although they do place great importance on safety in the selection of a helmet and safety gear, it is striking that looks rank highly in both choices as well. The particular risk attitudes apparent in Look-at-me Enthusiasts also might lead to concern about whether they set the bar high enough when deciding what is safe enough: they remain the segment least likely to hesitate about riding in jeans and T-shirt. There may be an opportunity, however, if standards and rating schemes can be positioned in a gently competitive way – so that, for instance, having 5 SHARP stars becomes something to brag about. Care would be needed not to alienate non-competitive segments here; but an approach to promotion which is not purely factual and utilitarian may help to break through to this critical segment of riders.

3.4.3 Fatigue

The topic of 'fatigue' draws together a number of related but different problems facing different motorcyclists in different ways, and eliciting slightly different responses. The most important difference to note is that between 'getting fatigued BY riding' (excessive task demand) and 'being fatigued (or in some other way mentally compromised) BEFORE riding' (sleepiness/drowsiness).

3.4.3.1 Getting fatigued by riding

Getting fatigued BY riding is a real potential challenge for those who ride for long distances or long periods of time, but one that was also recognised by those in our sample for whom this was the case. This type of fatigue would come under the excessive task demand category described in the introduction. Participants in our qualitative phase of work identified three broad categories of tactic for dealing with fatigue of this kind:

Precautionary tactics: these are the things that riders can do prior to riding to reduce the chances of their getting fatigued en route, such as avoiding wearing too many clothes, planning the route, and so forth.

"On a bike you can do things, you can reduce the amount of clothing you wear and so that you don't get too hot, so to speak, so you don't get too warm. I think that's one of the main things on a bike, is that you don't get too hot." [M, 40, 600cc]

"See, a big lunch can make you feel tired. That's well publicised isn't it?" [M, 62, 1000cc]

"If you don't plan a route, you get lost. If you get lost, you get fatigued, you get tired, you get angry, you get stressed, you get lost, you get a dead-end." [M, 50, 1100cc]

Diagnosis tactics: these are the ways in which riders monitor their own mental state – or use some other mechanism (such as the tank emptying) to ensure that they get breaks at the right intervals.

"And you know when your concentration starts to lapse and you have misjudged a corner, you know then that you need to have a break and you relax your mind and everything else." [M, 55, 900cc]

"The main reason that we don't usually suffer from fatigue is because a tank of petrol probably only lasts 120, 130 miles, an hour and a half, an hour and three quarters, then you're off the bike, you're filling up, and you get the break don't you?" [M, 62, 1000cc]

Remediation tactics: these are the things that riders can do to reduce their fatigue having identified it, e.g. taking a break or using stimulants such as coffee or Red Bull. A number of riders suggest that the adrenaline of riding would itself provide the necessary stimulation.

"If I'm starting to feel tired then I'll have a break and relax because the concentration that you need is very high and that can drain you, as well. On the other side, if it's all

going well, that counteracts that with the adrenaline coming through you and compensates to a certain level." [M, 55, 900cc]

"When you're on a bike, it's a hell of a buzz, so you're not thinking about fatigue anyway." [M, 62, 1000cc]

Our qualitative work suggested that, in many instances, knowledge of these tactics is acquired from other riders; and in some instances, there is a lack of consensus about the best tactic in a given approach. A good example of this, which prompted some debate between participants, is the use of stimulants such as Red Bull. The following is illustrative of the kind of debate that took place.

[M, 44, 250cc]: "Well, to me, it [Red Bull] can't be far off pure caffeine, drinking those things, and a very high sugar level. It does give you, for a certain level, it raises your blood sugar, it gives you a certain wrong level of alertness and you're awake and ready to go. And that quickly drops after ten to 15 minutes. You'd be knackered. You've probably got to work a lot of hours, you've got to go and do something unforeseen and one or two cans of that gives you the…"
[M, 62, 1000cc]: "I've got that [Red Bull] on the exemplary board [i.e. safety], if you're doing a lot of distance, it raises your sugar level and helps hydrates you at the same time. […] If I'm touring abroad I take loads of Red Bull with vodka in it, no! Coffee, Red Bull."

3.4.3.2 Being fatigued before riding

Unlike getting fatigued by riding, being fatigued BEFORE riding is a potential issue for any rider. This type of fatigue would be in the sleepiness/drowsiness category described in the introduction category. For many participants, feeling under par in some way provided clear grounds for not riding.

"You have got to have the right mind set. If you have had a really bad day at work, I wouldn't go out and ride my bike because you need to be right in your head and you have got to leave all your problems behind and just start riding the bike." [M, 55, 900cc]

"But if you are tired, like fatigued, when you've been having a few late nights, regardless of whether you have been drinking, you wouldn't go out for a pleasurable weekend ride because you wouldn't be able to stay in control. If it's a necessity, if you've slacked off and you have to get to work, maybe. I would investigate other options." [M, 45, 600cc]

It was interesting, however, to note a number of potential reasons why someone might nevertheless choose to ride when fatigued, especially as it seems likely that these will affect different segments differently:

Lack of awareness: if one does not recognise one's state of mind or its potential impact on one's safety, then one will clearly not take it into account in deciding whether to ride or not.

"You should be alright. If you sleep, you should be all right." [M, 18. 120cc]

"I don't even know what fatigue means." [M, 16, 50cc]

Lack of choice: for a leisure rider, the option exists simply not to take a trip. But for someone who is commuting to work, the journey still has to be made, making the choice not to ride dependent on the availability of alternatives – typically the car, which was seen by many participants as requiring less mental alertness to drive.

"I will make sure if I feel under the weather, I will rather revert to the car, but that doesn't happen a lot. I had a bit of a chest infection some time ago, and I just stayed in for a couple of days, and then of course I revert to the car for two days" [M, 45, 125cc]

There are a number of reasons why individuals may not have viable alternatives. A courier, for instance, may not be able to make deliveries to time in traffic if s/he does not go by bike. It is worth noting, however, that one group likely to lack alternatives is

the Car Aspirants, for the simple reason that most of them are likely to lack one of the most obvious alternatives, namely a car.

Where riders do not have a choice (or do not feel they have one), they may resort to tactics such as stimulants to deal with their fatigue.

"If you haven't got a choice, then I would decide a Red Bull, I would personally. If you've two options, you ride without it or you ride with it, that's your choices, then I would." [M, 48, 1000cc]

As noted above, there was some debate among participants in the qualitative work as to whether such stimulants did deliver a safety benefit, and how best to use them.

3.4.3.3 Quantitative findings on fatigue

25% of the total sample said that they had ridden when too tired during the last 3 years, with 6% saying they had ridden when too tired to ride safely, and 2% saying they had been involved in an accident or near accident as a result. Given the likelihood that these numbers under-represent the actual incidence and consequences of fatigue, these are not unappreciable percentages.

Figure 18 presents key facts relating to each segment with regard to fatigue.

Figure 18 – Key fatigue facts

Look-at-me enthusiasts

Significantly more likely than riders in general to ride after a hard day's work or after a few too many drinks the night before

Significantly more likely than riders in general to use strong coffee/Red Bull to wake themselves up

Riding disciples

No significant patterns against average

Performance disciples

Significantly more likely than riders in general to say they have ridden when too tired during last 3 years

Significantly more likely than riders in general to ride: after a long time/distance riding; after a bad night's sleep; at end of a hard day's work.

Signifiicantly more likely than riders in general to use strong coffee/Red Bull to wake themselves up

Riding hobbyists

Significantly less likely than riders in general to ride after a long time/distance, or after a hard day's work

Significantly less likely than riders in general to use coffee/Red Bull to wake themselves up

Performance hobbyists

More likely than riders in general (with 90% confidence only) to say they have ridden when too tired during the last 3 years

Significantly more likely than riders in general to use strong coffee/Red Bull to wake themselves up

Car rejecters

Significantly less likely than riders in general to ride after a long distance

Significantly less likely than riders in general to use coffee/Red Bull to wake themselves up

Car aspirants

Significantly less likely than riders in general to ride after a long time/distance

Significantly less likely than riders in general to use coffee/Red Bull to wake themselves up

Some clear conclusions are readily apparent from this table.

1. Fatigue is first and foremost an issue facing Performance Disciples, who are more likely to experience both fatigue by and fatigue before riding. Also affected are Performance Hobbyists and Look-at-me Enthusiasts, both of which segments appear to mirror the patterns of fatiguing behaviour found in Performance Disciples but to a less extreme (and therefore not statistically significant with respect to the mean) way. (With regard to driving after too many drinks the night before, Look-at-me Enthusiasts set the extreme and the other two segments follow close behind). These three segments taken together account for 14 of the 18 reported accidents or near accidents due to fatigue.
2. There was debate between riders in the workshops about whether or not it was a good idea to consume products containing caffeine as a way to combat fatigue when riding. Interestingly, the statistics suggest that the groups which wouldn't consider using strong coffee or caffeine drinks to wake up are also the groups who don't report to experience fatigue when riding. Conversely, those who report to experience fatigue at least at times when riding, were significantly more likely to use such stimulants.
3. Given the relationship between fatigue and segments with a high interest in performance, the best way to disseminate best practices in fatigue management is almost certainly through training-based routes, which emphasise enhancing personal performance as much as increased safety.

4 Segment Profiles

The following sections give an overview of each segment's definition, profile, attitudes to risk and choices with respect to bike, helmet and safety gear and ride/no-ride decisions.

4.1 Riding Hobbyists (segment 1)

Size: 14.5%

<table>
<tr><th colspan="2">Definition</th></tr>
<tr><td colspan="2">Riding motivations</td></tr>
<tr><td colspan="2">Primarily defined by low importance attached to Self Sufficiency (in particular), Power of Bike and Challenge of Riding
Marginally higher importance attached to Belonging and Sensations</td></tr>
<tr><td>SIGNIFICANTLY HIGHER THAN MEAN ON
S25 Social interaction
S28 Feeling at one with the machine
S30 Belonging and camaraderie</td><td>Also high, though not at 95% significance level, on
S15 Weather/scenery
S16 Wind rushing past
S26 Looking good
S29 Heritage/tradition</td></tr>
<tr><td>SIGNIFICANTLY LOWER THAN MEAN ON
S1 Fuel/parking saving
S2 Not rely on others
S3 Get places quicker
S4 Not bother w others
S7 Going really fast
S8 Power vs car
S11 Getting away faster than cars
S12 Balancing bike
S17 Never knowing what will happen next
S18 Test self & abilities
S19 Learn/get better
S22 Understand bike
S23 Demonstrate skills
S24 Pitting self against others</td><td></td></tr>
<tr><td colspan="2">Passion & Commitment</td></tr>
<tr><td>Passion: Average</td><td>54% very passionate, compared to all rider average of 57%</td></tr>
<tr><td>Commitment: Average</td><td>78% (77% average) will definitely ride in 3 years</td></tr>
</table>

Profile	
Demographic	
Male and older (peaks in 45+ age range)	63% aged 45+ (compared to an average for all riders of 43%)
Married and living together, with children	80% married/living together, 57% with children (averages 60%, 48%)
Better off: higher incidence of company directors and retired	19% & 12% respectively (averages (10% & 7%)
Bike and Gear	
Touring bikes, bigger than 700cc. Segment with biggest proportion of bikes .1000cc. Classic bikes also prominent.	Touring (29% vs 12% average). 53%> 700cc, 23% >1000cc (averages 36%,16%). 12% Classic (average 6%)
Segment that owns most bikes and rides the oldest bikes	41% own more than one bike, and for this 41% the average number is 2.75 (averages 34% and 2.40). Average age of most often ridden bike 10.57 yrs (versus 7.99yrs average)
Most likely to wear full face helmet but significant proportion of open face wearers. Helmets are older than average	Full face – 70% (74%); Open face - 17% (12%). 34% have a helmet three years old or older (average 28%)
Wear leather, but without armour	70% wear a leather jacket and 68% leather trousers (average 53%, 49%)
Riding	
2nd longest riding career and almost half have had a break	63% have been riding for 10 years+ (average 50%) and 44% taken a break (average 40%)
Low mileage riders, primarily for summer leisure and fun on rural roads	68% < 4Kp.a. (53%), 48% Summer only (34%), 39% rural roads (21%)
Highest % car drivers driving high mileage	90% drive (average 72%) and 53% drive > 10Kp.a. (average 37%)
High percentage of full licence holders but low levels of training	96% have a full licence (81%), 34% had no training at all (25%)
Average exposure to safety agencies (dealers, media, events etc)	15% have high exposure (average 13%)

Attitudes to Risk	
Average assessment of general and personal risk of motorcycling	Mean scores (7= very safe); 3.65 (3.66) and 4.43 (4.48)
Lowest level of accident propensity (TRL measure)	35% in lowest quartile (21% average)
Lowest experience of risky situations	37% None in last 3 years (28% average)
Least likely to attribute risk to other road users	36% (average 41%)
Lowest on "constantly thinking" about risk of riding	34% (average 39%)

Choices	
Bike	
Values brand/ make & classic style (open ended response)	21% & 9% respectively (average 14% & 3%)
More likely to buy new, but if s/hand to buy privately	39% new: 11% privately if s/hand (averages 35% and 5%)
Helmet	
Least likely to continue wearing if dropped on hard surface	14% (average 17%)
Most likely to have bought from specialist store	92% (average 86%)
Wear every time they ride	99% (average 97%)
Choice is based on brand/ reputation of manufacturer	67% great importance to brand (average 60%)
Highest awareness and compliance with SHARP rating	26% & 10% (average 22% & 6%)
Gear	
Wear leather, but without armour	70% wear leather jacket & 68% leather trousers (average 53% & 49%)
Purchase from specialist outlets	92% (average 91%)
Brand/ reputation primary factor in choice	54% great importance to brand (average 55%)
Below average wearing of high visibility clothing	30% wear and of these 50% every time they ride (average 39% & 48%)
Ride/No-ride	
Less likely than average to ride when fatigued, in a rush or in poor visibility	40% (ave 24%) would definitely not ride after bad nights sleep, 33% (13%) after a hard days work, 21% (11%) after riding for more than 2 hours, 25% (11%) when in a rush and 46% (17%) in bad weather

4.2 Performance Disciples (Segment 2)

Size: 8.3%

Definition	
Riding benefits	
High on Power of Bike and quite high on Belonging Low on Feeling/ Sensations and Showing Off	
SIGNIFICANTLY HIGHER THAN MEAN ON S3 Get places quicker S6 Exhilaration S7 Going really fast S8 Power vs car S9 Acceleration S10 Achievement S11 Getting away faster than cars S12 Balancing bike S18 Test self & abilities S28 Feeling at one with machine S30 Belonging and camaraderie	
SIGNIFICANTLY LOWER THAN MEAN ON S1 Fuel/parking saving S13 Sounds/smells S14 Noise/vibration S15 Weather/scenery S16 Wind rushing past S17 Never knowing what will happen next S26 Looking good	
Passion & Commitment	
High on passion (second only to Segment 5)	65% very passionate (compared to 76% Segment 5 and 57% average)
Very high on commitment	90% definitely will be riding in 3 years time (average 77%)

Profile	
Demographic	
Most masculine segment, mid-life (peaks in 25-44, low in 45+)	95% male (average 88%), 51% aged 25 - 44 (average 40%)
Higher than average in terms of marriage and having children	65% married/living together and 55% have children (average 60% &48%)
Average on all other demographics	
Bike and Gear	
Rides Sports Bike, large bikes 750 cc and above	69% ride Sports Bike (average 40%), 47% > 750cc (average 32%)
Average number of bikes owned	35% have other bikes in the h/hold (average 34%)
Full – face helmets of average age	90% (average 74%) of mean age: 2.82 years (average 2.28 years)
Wear armour, lots of textile clothing	70% (51%) wear armoured jackets and 55% (36%) armoured trousers
Riding	
Longer than average riding career, second most likely to had a break	71% (64%) been riding for 5+ years and 48% (40%) taken a break
Highest mileage riders, riding all year round for business & pleasure	65% (47%) ride > 4K p.a. Only 30% (34%) ride summer only
High % of car drivers, driving the most miles	80% (72%) drive, driving on average 14K miles p.a. (average 11K)
Full licence holders most likely to have/consider advanced training	84% (81%) with full licence, 13% (8%) have taken advanced training and 18% (12%) are considering it
High exposure to agencies promoting safety (specialist media etc)	57% (43%) in top two quartiles

Attitudes to Risk	
Segment rating riding risk highest – both personally and generally	40% (32%) consider riding very/ quite risky generally and 27% (19%) very/ quite risky for them personally
Moderately high risk on Accident Liability (TRL measure)	63% (52%) levels 2 or 3 on accident propensity
Across board, higher declared incidence of risky events, including riding when tired	37% (25%) have ridden when tired, 12% (6%) when too tired to ride safely and 5% (2%) have been involved in an accident due to tiredness
Most likely to attribute riding fatalities to lack of training	8% (4%)
Highest on "I can live with the risk"	72% (58%) can live with risk of riding

Choices	
Bike	
On open question go for speed, performance and size of bike (comfort not an issue compared to other segments) On closed question: go for acceleration and power: not interested at all in fuel consumption	18% (6%) choose on speed, 13% (7%) on performance and 6% (2%) on size – only 14% (20%) choose on the basis of comfort 58% (45%) place great importance on power, 63% (41% on acceleration. Only 23% (39%) look at fuel consumption
Average in purchasing new/ s/hand and where from	Purchasing new 36% (35%) from dealer 42% (38%)
Helmet	
Less likely than average to wear helmet having dropped on hard surface	14% (17%)
Average source of purchase	86% (86%) from specialist dealer
Wear every time they ride	98% (97%)
Average for factors in choosing helmets except noise reduction	All scores close to average, Noise reduction 8% (3%)
Higher awareness of all helmet standards particularly ACU Gold Sticker	55% (43%)
Gear	
Distinguished by wearing armoured jackets, trousers, gloves and boots But not worn on every occasion	70% (51%), 55% (36%), 46% (32%), 44% (30%) plus back plate 49% (32%) 77% (77%) wear on every occasion
Purchase from specialist motorcycle shops	94% (91%)
Average for all factors when choosing clothing	All scores close to average
Lower than average wearing high visibility clothing	30% (39%) wear and only 44% (48%) of these wear every trip
Ride/No-ride	
Most likely segment to ride in a rush, when tired or after a long distance	Above average for riding for more than two hours (3.87: 3.48), riding after a bad nights sleep (3.13: 2.78), riding at the end of hard days work (3.82: 3.51), riding when in a rush (4.02: 3.58), after seeing an accident (3.92: 3.57), at night (4.22: 3.91) after travelling a long distance (4.13: 3.70)

4.3 Performance Hobbyists (Segment 3)

Size:14.7%

Definition	
Riding benefits	
High on Feelings/Sensations and quite high on Power of Bike Low on Belonging, quite low on Showing Off	
SIGNIFICANTLY HIGHER THAN MEAN ON S2 Not rely on others S3 Get places quicker S6 Exhilaration S7 Going really fast S8 Power vs car S9 Acceleration S11 Getting away faster than cars S12 Balancing bike S13 Sounds/smells S14 Noise/vibration S15 Weather/scenery S16 Wind rushing past	
SIGNIFICANTLY LOWER THAN MEAN ON S23 Demonstrate skills S24 Pitting self against others S25 Social interaction S26 Looking good S27 Riding = identity S28 Feeling at one with machine S29 Heritage/tradition S30 Belonging and camaraderie	
Passion & Commitment	
Average passion about riding	85% very/quite passionate about riding (average 88%)
Average expectation about riding in 3 years time	73% will definitely ride in 3 years time (average 77%)

Profile	
Demographic	
Male, mid aged (25-44)	90% male (88%), 47% aged 25-44 (40%)
Average marital status and presence of children	55% married (60%), 46% have children (48%)
Likely to be living in London/SE and most ABC1	30% (25%) and 65% (60%)
Bike and Gear	
Sports bikes with engine capacity of 500-700cc	45% own a sports bike (40%), 30% 500-700cc (21%)
Unlikely to own another bike	33% own more than one (34%)
Full face helmet less than 3 years old	80% wear a full face helmet (74%), on average 2.16 years old (average 2.28 years)
Above average presence of armour – particularly in jacket	57% wear armoured jackets (average 51%)
Riding	
Average length of riding career and incidence of break	60%v have ridden 5+ years (63%) and 39% taken a break (40%)
Summer only for commuting and pleasure	42% only ride in summer (34%), 22% for commuting (14%)
Average car drivers	73% drive (72%), around 10K miles p.a.
Full licence holders, significantly more likely to have receive training than Riding Hobbyists (the other summer-only segment)	83% have full licence(81%),76% have undertaken some form of training (69%)
Exposure to safety agencies low for experienced riders	29% in lowest quartile of exposure (23%)

Attitudes to Risk	
Marginally likely to view risk higher for self and m/cyclists generally	Self: 4.34 vs 4.48: General: 3.55 vs 3.66 (where Very safe = 7)
Segment contains both high and low accident propensity groups	27% in Level 1 (21%) and 29% in Level 2 (25%)
Most likely to admit having over estimated their abilities, taken a risk to impress others and ridden when tired	24% have overestimated their abilities (16%). 12% taken a risk to impress (7%), and 33% ridden when tired (25%)
Most likely to respond "Life without risk would be boring" to fatality statistics	71% (65%)

Choices	
Bike	
Most significant factor in bike purchase is acceleration	50% place great importance (average 41%)
Segment most likely to buy s/hand	74% (65%)
Helmet	
More likely than anyone to continue wearing after dropping helmet	19% (17%)
Purchase from specialist motorcycle shops	89% (86%)
Claim to wear on every trip	97% (97%)
Least likely to consider brand/reputation in purchase	No importance: 14% (9%)
Average awareness of safety standards	
Gear	
Average wearing of protective clothing and wardrobe worn	96% wear protective clothing (94%) and 78% wear every time (77%)
Average source of purchase	91% from specialist motorcycle shop (91%)
Average choice criteria	
Low incidence of wearing high visibility clothing and lowest wearing it	36% (39%) of whom only 32% wear on every trip (48%)
Ride/No-ride	
Most likely (with Segment 2) to carry on riding having seen serious accident involving motorcyclist	60% claim it would have little/ no impact (49%)

4.4 Look-At-Me-Enthusiasts (Segment 4)

Size: 24%

Definition	
Riding benefits	
Very high on Showing Off Quite high on all other factors except Relationship with Bike and Release	
SIGNIFICANTLY HIGHER THAN MEAN ON 28 of the 30 statements **Significantly higher than ALL 6 other segments on** S17 Never knowing what will happen next S23 Demonstrate skills S24 Pitting self against others S26 Looking good	
SIGNIFICANTLY LOWER THAN MEAN ON NONE **The only statements on which this segment is NOT significantly higher than average are:** S20 Heightened awareness of everything around me S22 Understanding the motorcycle and taking care of it	
Passion & Commitment	
Passionate about riding	93% very/ quite passionate (88%)
BUT only average about commitment	77% will definitely be riding in 3 years time (77%)

Profile	
Demographic	
Averagely male but significantly young < 25 years old	28% aged under 24 (17%)
Single and living with parents	31% (19%)
High incidence of students and skew towards living in SE/London (similar to Cluster6)	11% students (6%) and 29% living in SE/London (25%)
Bike and Gear	
Surprisingly average across engine size and bike types	Average by type and size of bike
Low level of multiple bike ownership in household	29% (34%)
Variety of helmets worn, mostly full face	74% wear full face (74%)
Indistinguishable by protective clothing worn	Average
Riding	
Highest group of novices (except Segment 6)	30% have been riding for less than 2 years (21%)
All year round everything!	75% (66%) ride all year round, 17% (12%) as part of job. 56% (44%) for commuting, 82% (72%) for leisure and 82% (71%) for fun
Among those who have car licence, less likely to drive regularly	25% (18%) do not have car licence. Of those that do 17% (11%) do not drive regularly
High on provisional licence holders only and highest on intention to get full licence. Most likely to have received some form of training	25% have a provisional licence (19%) and 87% intend to obtain a full licence (81%) Only 18% have not been trained (25%)
Likely to visit m/cycle dealers and m/cycle websites	60% regularly visit dealers (52%) and 38% websites (31%)

Attitudes to Risk	
Rate m/cycling, generally and personally, safer than anyone else	Mean scores (7=very safe): General 3.90 (3.66). Personal 4.66 (4.48)
Highest accident propensity, according to TRL measure	38% in top quartile (average 25%)
Highest admittance of experiencing risky situations but none specifically	79% (72%) have experienced at least one
No specific reason to explain m/cycle fatalities except other road users	44% (41%)
Most likely to agree with "I am a good rider so the risk does not apply to me"	33% (24%) agree with this statement

Choices	
Bike	
Most important factors in choice are looks: acceleration, power and sound	Of great importance: Looks 73% (61%), Acceleration 60% (41%), Power 58% (45%) and Sound 50% (38%)
Likely to purchase bike like everyone else, second hand rather than new	66% second hand (65%), more likely from dealer: 40% (38%) or small ad /E Bay: 31% (29%)
Helmet	
Average response to dropping helmet	Only 18% (17%) would continue to wear
Purchased current helmet from specialist m/cycle shop	84% (84%); Average age of helmet; 2.0 years (2.28)
Wear every time ridden	96% (97%)
Like bikes, looks are very important in choice, Only comfort is more important	21% (14%) choose looks as the main factor in choice. Comfort 27% (30%)
Average awareness of safety standards and compliance of own helmet	Q34, Q35, Q36
Gear	
Very marginally less likely to wear protective clothing or wear it all the time. Most likely to entertain riding in T shirt and trainers	92% (94%) wear protective clothing and 75% (77%) wear on every trip. 66% would definitely not ride in T shirt and trainers (average 76%)
Lowest incidence, albeit marginal, of buying from specialist outlets.	88% (91%). 13% of purchase made by mail order/ online (11% average)
Really, really care about how gear looks. Above or average on all other aspects of clothing, including safety/protection certification	51% (36%) state looks are of great importance 84% (80%) give safety great importance
Average wearing and frequency of wearing high visibility clothing	39% (39%) wear and those that do 48% (48%) wear every time
Ride/No-ride	
More likely to ride on all occasions than the average. The main exception is after "having seen a serious accident involving a motorcyclist"	Significantly: After too many drinks; At end of hard days work; Minor fault with bike

4.5 Riding-Disciples (Segment 5)

Size:16.3%

Definition	
Riding benefits	
High on Belonging, Sensations, Self sufficiency, Release Highest segment on Relationship with Bike Low on Showing Off	
SIGNIFICANTLY HIGHER THAN MEAN ON S2 Not rely on others S3 Get places quicker S4 Not bother w others S5 Getting away S6 Exhilaration S10 Achievement S12 Balancing bike S13 Sounds/smells S14 Noise/vibration S15 Weather/scenery S16 Wind rushing past S20 High awareness S21 Relaxed S22 Understand bike S25 Social interaction S27 Riding = identity S28 Feeling at one with the machine S29 Heritage/tradition S30 Belonging and camaraderie	
SIGNIFICANTLY LOWER THAN MEAN ON S7 Going really fast S8 Power vs car S11 Getting away faster than cars S23 Demonstrate skills S24 Pitting self vs others S26 Looking good	
Passion & Commitment	
Sky high on passion!	76% very passionate (average 57%)
Also high on commitment	90% will be riding in 3 years time (average 77%)

Profile	
Demographic	
Most male group, and older (peaks in 45+ age group; high on retired)	93% male (88%); 60% aged 45+(43%); 17% retired (7%)
Married and living together (but less likely than Segment 1 to have children)	64% married (60%), 50% with children (48%)
Most likely to be C2DE	45% (38%)
Bike and Gear	
Riding large bikes > 1000cc or Classic and Custom bikes	>1000cc 21% (16%), Classic 11% (6%), Custom 9% (6%)
Highest multiple ownership but not largest collections	50% own more than one bike (34%).On average 2.38 (2.40)
Majority wear full face but highest incidence of open face helmets	Full face 72% (74%), Open face 18% (12%): Equal highest average age of helmet 2.81 years old (2.28)
Like Segment 1 wear leather but armoured like Segment 2	Leather jacket 63% (53%) Armoured trousers 45% (36%)
Riding	
Riders who have ridden longest and most likely to have taken a break	73% (50%) have ridden for more than 10 years. 55% (40%) have taken a break in their riding career
All year round riders primarily for leisure and fun; on both urban and rural roads	All year round leisure 78% (72%), fun 77% (71%): On both urban and rural roads 72% (64%)
Heavy car drivers like Segments 1 & 3	46% drive 10K+ p.a.(37%)
2nd highest proportion of full licence owners but least likely to have received any training or seek it in the future	93% (81%) have a full licence, 37% (28%) have received no training whatsoever and 44% (31%) do not intend to get it in the future.
Most likely to be a member of m/cycle organisation, read specialist magazines and attend organised m/cycle events	Most likely to fit highest quartile in regards to exposure to agencies of safety – 20% (13%)

Attitudes to Risk	
Average attitude to risk generally and personally but a minority who consider themselves very safe	17% very safe personally (12%) – but spread of attitudes
Spread of accident propensity (according to TRL measure) but skew towards lower accident risk	61% (54%) in lowest two quartiles
Below average experience of all risk events except being fined for speeding	9% have been fined for speeding (6%)
No differences than average in explaining reasons for m/cycle fatalities	43% (41%) – other road users
Strong views that "protective clothing will reduce risk", "primary purpose in riding is to arrive safely", "constantly thinking about risk when riding" but equally strongly reject "if the risk is that high that I would consider giving up riding"	Strongly agreeing to: "protective clothing" 50% (40%); "arrive safely" 86% (75%); "constantly think about risk" 47% (39%) BUT strongly disagreeing to "giving up" 36% (26%)

Choices	
Bike	
Primary factors in choice are comfort, manoeuvrability and manufacturer/brand	Considered of great importance by 79% (72%); 71% (63%) and 60% (54%) respectively
Similar to all bikers, more likely to buy second-hand from a dealer	Bought second- hand 64% (65%) from dealer 38% (38%)
Helmet	
Segment least likely to ride if they had dropped helmet on a hard surface	44% (31%) would definitely not ride
Similar to all bikers would primarily buy from specialist shop	87% (86%)
Universal wearing	98% (97%) would wear on every trip
More likely than anyone to mention spontaneously comfort and good fit as main reason for selecting a helmet	37% (31%) and 26% (21%) respectively
Average awareness of safety standards and certification of their own helmet	
Gear	
Distinguished by wearing leather and armoured gear, similar to Segment 1 on the former and Segment 2 on the later Like all bikers, will not necessarily wear every time they ride	Example: Leather trousers 58% (49%): Armoured trousers 45% (36%) 75% (77%) would wear every time they rode
Like all bikers, would purchase from specialist m/cycle shop	92% (91%)
Comfort is of greatest importance in choice	96% (92%)
Most likely to own high visibility clothing – but only wear it when conditions require	45% (39%) wear high visibility clothing but only when conditions require 37% (31%)
Ride/No-ride	
Like Segment 1, is most influenced not to ride by all events presented. The only exception is willingness to continue riding beyond 2 hours	Mean score (5= No impact) 3.62 (3.48)

4.6 Car Aspirants (Segment 6)

Size: 11.2%

Definition	
Riding benefits	
High on Challenge of riding, Self sufficiency (especially "saving on fuel and parking"), and marginally on Relationship with bike Low on everything else, especially Release	
SIGNIFICANTLY HIGHER THAN MEAN ON S1 Fuel/parking saving S2 Not rely on others	
SIGNIFICANTLY LOWER THAN MEAN ON S4 Not bother w others S5 Getting away S6 Exhilaration S7 Going really fast S8 Power vs car S9 Acceleration S10 Achievement S11 Getting away faster than cars S13 Sound/smells S14 Noise/vibration S15 Weather/scenery S16 Wind rushing past S18 Test self & abilities S20 High awareness S23 Demonstrate skills S24 Pitting self against others S25 Social interaction S26 Looking good S27 Riding = identity S28 Feeling at one with the machine S29 Heritage/tradition S30 Belonging and camaraderie	
Passion & Commitment	
Passionless!	27% indifferent or without passion (13%)
Least committed to motorcycling	Only 59% will definitely be riding in three years time (77%)

Profile	
Demographic	
Male and youngest riders	Male 88% (88%); 29% (17%) aged under 24
Single living with parents	31% (19%)
Most likely to be students, living in London/SE	Students 14% (6%), living in London/SE 33% (25%)
Bike and Gear	
Ride scooters and mopeds so biased towards < 50cc	20% (11%) scooters; 18% (7%)mopeds: 23% (9%) under 50cc
Lowest level of multiple bike ownership	21% (34%)
Higher than average on flip front helmets (and newest helmets)	16% (14%); Average age 1.92 years (average 2.28 years)
Protective clothing most likely to be textile, no leather, no armour	Textile jacket 56% (44%)
Riding	
Shortest careers in motorcycling	38% (21%) less than two years
All year round commuting and low mileage	61% (44%) all year round commuting; 61% (53%) <4000 miles p.a.
High on urban-only riding	26% (15%)
Least likely to have a full licence to drive a car	63% (79%)
Most likely to hold a provisional motorbike licence	36% (19%)
Least likely to be exposed to safety agencies (dealers, media etc)	34% (23%) in lowest quartile of exposure

Attitudes to Risk	
Rate m/cycling, generally and personally, safer than anyone else other than Look-at-me Enthusiasts	Mean scores; 7= Very safe; Generally 3.77 (3.66), Personally 4.61 (4.48)
HIGHER RISK GROUP according to TRL accident propensity measure	35% (25%) at level 4 (Top quartile)
Unlikely to have experienced many of the dangerous situations presented	34% (28%) experienced none
Most likely cluster to attribute "not being seen" as main reason for m/cycle fatalities	29% (24%)
Most likely to "consider giving up" in response to risk statistics	Mean score; 5= strongly agree: 3.00 (2.79)

Choices	
Bike	
It is all about running costs. Economical/ fuel economy (open ended); Fuel consumption (closed)	14% (7%) on the open question; 59% (39%) of great importance on the closed question
Average purchasing behaviour re; new/second-hand and source of purchase	64% (65%) buy second-hand and 40% (38%)do so from a specialist dealer
Helmet	
2nd only to Cluster 5 in stating definitely would not ride if dropped helmet on hard surface	43% (31%)
Least likely to have purchased from specialist outlet	79% (86%); most likely to have purchased on the high street (6%) or mail order/ on-line (9%)
Wear a helmet on every occasion	96% (97%)
Main factors in choice are comfort and safety certification	In spontaneous mention, it is safety/safety features that is significant: 28% (20%)
Lowest awareness of safety standards	10% (6%)) could not name one, despite owning the newest helmets
Gear	
Average wearing of protective clothing but significant minority could not specify its features. Those that could were more likely to wear textile rather than leather	An example: 92% (94%) claim to wear protective clothing. 27% (15%) could not specify the trousers and 27% (13%) the boots. Suggesting a significant minority only wear protective jackets and gloves.
Average purchasing pattern	91% (91%) from specialist motorcycle shops
Safety certification is most important in purchase decision but not looks	Safety important to 86% (80%); Looks unimportant to 24% (14%)
Average incidence of wearing high visibility clothing but those who have it are most likely to wear	46% (39%) have high visibility clothing and 63% (48%) wear it every time they ride
Ride/No-ride	
Most likely to ride wearing T shirt and trainers but least likely if they dropped their helmet on a hard surface, going on a long journey or if they needed a strong coffee or caffeine drink	13% (8%) would ride in T shirt; 43% (31%) would not ride if they dropped their helmet; 21% (11%) after having a strong coffee/caffeine;13% (8%) if they had to travel a long distance

4.7 Car Rejecters (Segment 7)

Size:10.1%

Definition	
Riding benefits	
High on Release. Low on Power of Bike, Belonging and Feeling Sensations	
SIGNIFICANTLY HIGHER THAN MEAN ON S1 Fuel/parking saving S2 Not rely on others S4 Not bother w others	
SIGNIFICANTLY LOWER THAN MEAN ON 24 of the remaining 27 statements	
Passion & Commitment	
Passionless	26% (13% average) indifferent or without passion towards m/cycling
Second lowest segment on commitment to riding in three years time	Only 61% (77% average) are definitely going to still be riding

Profile	
Demographic	
This is the segment with more women than any other. Average age profile with slight peak at 25-44	28% (12% average) are female 43% (40%) are aged 25-44
Married/ living together, with children	64% (60%) married/ living together, 55% (48%) with children
Lower income – skew to under £20K p.a.; living in SW/Wales	19% (11%) <£20K: 30% (20%) live in SW/Wales
Bike and Gear	
Ride bikes under 125cc, most significantly scooters and mopeds less than 4 years old	51% (26%) <125cc; 25% (11%) scooters; 17% (7%) mopeds; 38% (32%) less than 4 years old
Less likely to have more than one bike in household but if they do they have the highest number	26% (34%) own more than one bike in h/hold. Those that do have the largest collection: average 2.96 (2.40)
Majority wear full face helmets but significant minority wear flip front helmets. The average age of these helmets is less than 2 years old	Full face: 65% (74%); Flip front 20% (14%)
Textile clothing is preferred to leather and armour is present at the lowest level of any segment	51% (44%) wear textile jackets; 46% (37%) wear textile trousers
Riding	
Not the newest riders (Segment 6) but almost a third have only been riding for less than 2 years	31% (21%) riding for less than 2 years
Riding is all year round commuting and summer leisure and fun Very low mileage	50% (44%) all year round commuting; 31% & 36% (23% & 26%) summer leisure and fun 33% (25%) < 2000 miles p.a.
High on urban-only riding	24% (15%)
Over two thirds also drive a car with an average mileage c10K p.a.	68% (72%) drive a car
2nd highest incidence of provisional licence holders Lowest intention to get full licence Two thirds have received some form of training, primarily CBT	33% (19%) provisional 58% (81%) of provisional licence holders intend to gain full licence 67% (69%) have received training. 57% (59%) only CBT
Lowest exposure to agencies promoting safety (dealers, media etc)	41% (23%) in lowest quartile

Attitudes to Risk	
Rate motorcycling in general and selves as risky	17% (10%) rate m/cycling in general as very risky and 10% (6%) rate it very risky for themselves
Average on TRL accident propensity measure but this hides a significant proportion who are very safe and a similar number who are very much at risk	28% (21%) Level 1 (safe) and 28% (25%) at Level 4 (at risk)
Not very likely to have experienced any of the riding situations presented	36% (28%) have experienced none
Marginally more likely to attribute m/cycle fatalities to irresponsible riding	23% (18%)
In response to accident statistics more likely to agree with the statements; "My primary purpose is to arrive safely" and "I would consider giving up riding"	79% (75%) strongly agree with "….arrive safely" and 17% (12%) strongly agree with "……giving up riding"

Choices	
Bike	
Primary factors in choice of bike are reliability, comfort and fuel consumption. The latter is most significantly different	54% (39%) rate fuel consumption of great importance
Segment most likely to buy new. If second-hand less likely to go to dealer than friends or small ads	40% (35%) buy new. 62% (55%) of second hand purchasers bought from friend or small ad. Only 25% (38%) bought from dealer
Helmet	
Response to dropping helmet on hard surface is the same as everyone else	71% (71%) would not continue to wear it
Like Segment 6 less likely to source helmet from a specialist shop. Worryingly a few obtained second hand	80% (86%) purchased from specialist 7% (3%) acquired second hand
Almost everyone wears their helmet every time they ride	96% (97%)
Safety certification is the primary consideration in helmet purchase	98% (92%)
Low awareness of all safety standards except BS (Kite mark) and even lower knowledge of their own helmets compliance. Awareness of SHARP is lowest in this group	9% (6%) could not mention any safety standard. 17% (8%) could not remember their own helmets accreditation. Only 17% (22%) were aware of SHARP.
Gear	
The vast majority claim to wear protective clothing but a significant minority do not wear protective trousers or boots. The material of choice is textile rather than leather. Armour is present in one third of all protective clothing worn. Lowest incidence of back armour	91% (94%) claim to wear protective clothing The most popular item is a textile jacket: 46% (37%) 21% (15%) do not wear protective trousers. 20% (13%) do not wear protective boots. Only 23% (32%) wear back armour 75% (77%) wear every time they ride
Most likely to purchase from specialist store but significant minority purchase on the high street	89% (91%) buy from a specialist. 11% (4%) buy in the high street
High importance given to safety certification	85% (80%) great importance
Average incidence of high visibility clothing but those who have it are the most likely to wear every time they ride	45% (39%) wear and 60% (48%) wear on every trip
Ride/No-ride	
Average in response to all situations presented	

5 Conclusions

The motorcycle safety research project has developed an original way to categorise riders based on their motivations to ride. The classification (segmentation) of the riders was based on thirty statements which were identified during the qualitative phase of the work. For each statement, the riders rated the things which were important to them about riding a motorbike, scooter or moped, on a five point scale, ranging from 'not important at all' to 'very important'. Eight 'motivational factors' were identified from analysis of the responses to these statements, which were used as the basis for the segmentation exercise.

There were 1,019 respondents, and 999 were allocated to a seven segment solution. The seven segments were described as:

- Look-at-me enthusiasts (segment 4)
- Car aspirants (segment 6)
- Performance disciples (segment 2)
- Car rejecters (segment 7)
- Performance hobbyists (segment 3)
- Riding disciples (segment 5)
- Riding hobbyists (segment 1)

The different segments' demographics, attitudes and perceptions of risk are highlighted. The segments are listed with respect to their accident liability scores, with Look-at-me Enthusiasts having the highest accident propensity and Riding hobbyists the lowest. A conceptual model was developed for the seven segments and the riders' **passion** for motorcycling and their relationship to **performance** were measured. This process was used to describe and quantify their riding behaviour.

It was recognised that a seven segment solution may prove unwieldy and difficult to use. However, it does reflect the real diversity of riders, and through the construction and explanation of the relationship between the segments, it is possible to link them where appropriate to form larger groups depending on the application (policy development, communications etc).

Scores for accident propensity were calculated and some clear patterns were identified:

- On either measure (accidents-per-year or accidents-per-mile), Riding Disciples and Riding Hobbyists have a relatively low accident propensity. Both have mean accident propensity scores significantly lower than the overall mean.
- Performance Disciples have a higher accident propensity, although in part this is because of a higher annual mileage.
- At the other end of the spectrum, Car Aspirants and Look-at-me Enthusiasts have the highest accident propensity on either measure. Both have mean accident propensity scores significantly higher than the overall mean.
- While not as risky, Car Rejecters and Performance Hobbyists also have somewhat higher accident propensities – although lower annual mileages mean they may not have accidents as often as Performance Disciples.

This research has concentrated on the riders' motivations and **risk perception**, and self reported decisions with respect to **choice of bike, helmet, safety gear** and avoiding **fatigue**.

Reviewing the evidence collected, the following conclusions are drawn with respect to rider motivation and risk perception associated with the **choice of bike**:

Car Aspirants, Car Rejecters and Riding Hobbyists are the segments most open to considering safety features in their selection of a bike.

1. Riding Disciples, in line with their active management approach to risk, are open to the importance of safety features on bikes. However, the low ranking in unprompted mentions (only 4 out of 163 riders mentioned it) suggests that features are not currently seen as part of the risk-management repertoire by these riders. There is clearly scope here to work with Riding Disciples to understand how safety features on bikes can become as much a part of their way of life as safety gear already is.
2. For Performance Hobbyists, some demonstration of the importance of safety features on bikes may be required as well as awareness raising. Given the emphasis placed by this segment on the experience of riding (and the attraction they seem to show to the thrill of risk) messages may need to emphasise ways in which safety features enhance that experience rather than diminishing it. However, in light of the fact that this segment is generally disconnected from riding circles, and is also significantly more likely to buy a bike second hand (74% against 65% of the total sample), it may prove hard to get these messages out.
3. For Look-at-me Enthusiasts too, some demonstration of the importance of safety features on bikes may be required as well as awareness raising. The challenge here will be to make safety compete in their decisions with other priorities, such as looking good and being able to go faster than other people. Given the blasé confidence exhibited by these riders, this effort will almost certainly need to go hand in hand with a wider effort to get Look-at-me Enthusiasts to take on board safety issues.
4. Performance Disciples will probably prove to be the hardest audiences to convince of the merits of safety features on bikes, with a mean importance score significantly below riders in general and only 1 rider (out of 83) mentioning safety features unprompted as a factor in bike choice. It seems plausible that the issue here may be a perceived competition between safety features and performance. It may make sense here to explore ways of positioning safety features on bikes as things that reduce the severity of accidents (in the way that armour does) as well as their likelihood. It might also make sense to emphasise the ways in which such features still require skilful riding if they are to have a positive effect, or even to create advanced training options specifically focusing on the skilled use of such features.

The real challenge in promoting **safer helmets and gear** is not to sell the importance of safety, but to influence perceptions of what is safe enough.

1. Car Aspirants pose particular challenges in respect of their judgements of what is safe enough, not least because they are a transitory riding population with limited budgets and, we believe, a tendency not to think about the risks of riding. However, the strong emphasis placed by this segment on safety suggests that there is real potential for simple, targeted educational messages – such as promotion of the SHARP scheme. There may be a lesson to be learned here from past efforts to communicate the importance of replacing dropped helmets, as this message seems to have reached Car Aspirants very effectively. Promotion of the SHARP scheme may also need to take account of the fact that Car Aspirants are significantly less likely than riders in general to buy their helmet from a specialist dealer (79% against 86% of the total sample).
2. Car Rejecters are another promising target for messages about safety standards, and likely to welcome schemes such as SHARP which facilitate decisions for them. Again, promotion efforts will need to take account of the fact that both pragmatist segments have very low exposure to specialist dealers, press, websites etc.

3. Look-at-me Enthusiasts, which represent nearly a quarter of the riding population, create unique challenges for the promotion of any safety messages. Although they do place great importance on safety in the selection of a helmet and safety gear, it is striking that looks rank highly in both choices as well. The particular risk attitudes apparent in Look-at-me Enthusiasts also might lead to concern about whether they set the bar high enough when deciding what is safe enough: they remain the segment least likely to hesitate about riding in jeans and T-shirt. An approach to promotion which is not purely factual and utilitarian, but instead taps into the motivations and interests of this group may help to break through to this critical segment of riders.

Some clear conclusions with respect to **fatigue** were:

1. Fatigue is first and foremost an issue facing Performance Disciples, who are more likely to experience both fatigue by and fatigue before riding. Also affected are Performance Hobbyists and Look-at-me Enthusiasts, both of which segments appear to mirror the patterns of fatiguing behaviour found in Performance Disciples, but to a less extreme (and therefore not statistically significant with respect to the mean) way. With regard to driving after too many drinks the night before, Look-at-me Enthusiasts set the extreme and the other two segments follow close behind. These three segments taken together account for 14 of the 18 reported accidents or near accidents due to fatigue.
2. There was debate between riders in the workshops about whether or not it was a good idea to consume products containing caffeine as a way to combat fatigue when riding. Interestingly, the statistics suggest that the groups which wouldn't consider using strong coffee or caffeine drinks to wake up are also the groups who don't report to experience fatigue when riding. Conversely, those who report to experience fatigue at least at times when riding, were significantly more likely to use such stimulants.
3. Given the relationship between fatigue and segments with a high interest in performance, the best way to disseminate best practices in fatigue management is almost certainly through training-based routes, which emphasise enhancing personal performance as much as increased safety.

The project has delivered a significant dataset, which has been interrogated successfully to describe motorcycle riders' characteristics, attitudes and self reported decisions with respect to choice of bike, helmet, safety gear and avoiding fatigue. The dataset contains significant amounts of other information, which is available to future research projects if required.

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Appendix A Model of accident liability from survey of motorcyclists (2004, TRL607)

Accidents were defined as 'public road accidents (including minor spills) involved in while riding a motorbike on public roads in the last 12 months'.

A multiplicative model of the following form has previously been found to be suitable, i.e.

Log_e (accident liability) = $b_0 + b_1 \log_e$ (miles) + b_2 f (age) + b_3 f (experience) + b_4 f (other factors) + …. + error

Where b_0, b_1, b_2, etc are coefficients to be estimated for the different functions of miles, age, experience etc., and 'error' is the residual error that is not accounted for by the fitted model.

Reciprocal age and experience functions have been found to be appropriate in previous studies and were again used in this analysis. It was also possible in these models to fit variables which are not continuous (as age, experience and mileage are) but are simple categories (like bike size).

Model variables fitted and parameters derived

Parameter	Level	Estimate	Standard error	z-statistic	Deviance explained
Constant, b_0	-	-6.769	0.214	31.66	-
Log_e (miles), b_1	-	0.415	0.024	17.36	285.6 on 1df
1/(age+9), b_2	-	51.500	4.130	12.47	338.8 on 1df
1/(exper+6), b_3	-	6.012	0.680	8.84	51.6 on 1df
Training, b_4	non-CBT	0.000	Reference Level	-	3.8 on 1df
	CBT	0.081	0.045	1.79	
'Rider dedication', b_6	1 Winter	0.000	Reference Level	-	76.0 on 5df
	2 Summer	-0.561	0.052	10.78	
Size of bike, b_5	Up to 125cc	0.000	Reference Level	-	7.1 on 1df
	126+cc	-0.167	0.045	3.75	

Example

By way of example, the model can be used to predict the accident liability of a rider who covers 4,000 miles per year, is aged 32, has five years' riding experience, has no CBT, just rides in the Summer on >125cc bike:

Parameter	Rider value	Parameter	Model value
Constant, b_0	-	-6.769	-6.769
Log_e (miles), b_1	log_e (4000)	0.415	3.440
1/(age+9), b_2	1/(32+9)	51.500	1.256
1/(exper+6), b_3	1/(5+6)	6.012	0.547
Training, b_4	non-CBT	0.000	0
	CBT	0.081	0
'Rider dedication', b_6	1 Winter	0.000	0
	2 Summer	-0.561	-0.561
Size of bike, b_5	Up to 125cc	0.000	0
	126+cc	-0.167	-0.167
	Sum of model values		-2.254
Accident liability	Exp(model value)		0.105

i.e.

$$\log_e(\text{accident liability}) = -6.769 + 0.415\log_e(4000) + 1.50/(32 + 9) + 6.012/(5 + 6) + 0.0 - 0.561 - 0.167$$

$$= -2.254$$

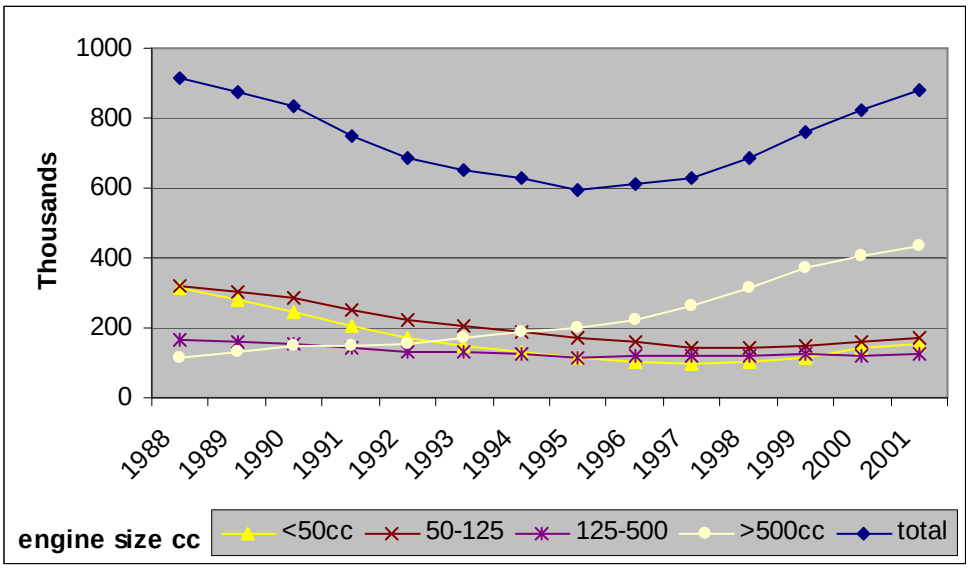
Therefore, accident liability = exp(-2.254) = 0.105 (accidents per year)

≈ 1 accident every 9.5 years

Hence in this way we can estimate the expected accident liability for any rider.

The expected values can be averaged within segment to give an indication of the different average annual accident liability by segment membership.

Number of motorcycles currently registered by engine capacity (from TRL607)



Source: Transport Statistics GB, 2002

Appendix B Statistical Appendix on the generation of the segmentation used

B.1 Introduction

The 2008 Trl Motorcycle Safety study was conducted over two clearly defined stages:

- A qualitative stage to identify the factors that determine motorcyclists attitudes towards and hence decisions preparations that they make before riding.
- A quantitative stage among a nationally representative sample of 1019 motorcyclists.

Segmentation of this quantitative sample was based on a battery of 30 statements, derived from the findings of the qualitative research and describing a range of issues that could be important to motorcyclists in relation to riding a motorbike, scooter or moped. Respondents were asked to rate each statement on a five point importance scale.

In this way the segmentation is based on the attitudes and beliefs of motorcyclists that determine into behaviour rather than on actual behaviour.

The outline of segmentation methodology employed falls into three sections:

- Factor analysis (section 2 below)
- Cluster analysis (section 3)
- Application of the segmentation to future motorcycle studies. (section 4)

B.2 Factor Analysis: Selection of the 8 factor solution

Factor Analysis is a 'data reduction' technique, used to group questions or variables together that are similar. It identifies questions that are rated in a similar way and reduces them into a smaller number of dimensions called 'factors'. The theory behind Factor Analysis is that when many measures are rated in a similar way, they can be grouped under a smaller number of underlying factors to simplify analysis. There are many several different types of Factor Analysis, but the one most commonly used in market research is called 'Principal Components Analysis'.

Factor Analysis might be used in the following situations:

- To understand patterns in the data
- To simplify large amounts of information
- As a precursor to other analysis
- To identify repetition amongst variables to help decide which questions can be omitted in future waves

Factor Analysis is a useful tool for summarising data, to make interpretation clearer. It is most often used with large batteries of statements, which, in their entirety are difficult to interpret. However, when these statements are reduced into factors, interpretation becomes much easier.

Factor Analysis is based on correlation between attributes. Attributes which are highly correlated tend to describe a similar theme and therefore can be considered together as one 'factor'. Factors are driven by the data, which means that the 'themes' that they represent give insight into how consumers subconsciously think about the attributes they are rating.

Factors can be used in other analysis. For example, the importance of factors can be determined quiet easily using regression analysis. Alternatively, respondents can be grouped into segments based on how they scored on the factors. Factors can also be

represented on a map. In any case, the overall objective of factor analysis is to reduce a large amount of data into a smaller amount, so that interpretation is easier.

The basis for the factor solution in the Motorcycle study was a set of 30 attitudinal statements generated from the qualitative phase of the research. The method used for factor extraction was Principal Components, which is the industry standard technique, and the rotation method was varimax (orthogonal) rotation which gives a very clear interpretation.

A number of alternative factor solutions were considered from a 6 factor solution to a 10 factor solution. The Eigenvalues associated the factor analysis are shown in the following table. Eight factors explain 65.5% of the data available from the 30 statements. This is a high proportion; the number of dimensions has been reduced from 30 to 8 (to 27%) but 65.5% of the information has been retained. The 8th factor has an Eigenvalue of 0.86 which is marginally below the recommended value of 1.0, but this is the only factor to fall below 1.0.

Total Variance Explained

Component	**Initial Eigenvalues**		
	Total	**% of Variance**	**Cumulative %**
1	8.55	28.5	28.5
2	2.84	9.5	38.0
3	2.11	7.0	45.0
4	1.66	5.5	50.6
5	1.41	4.7	55.3
6	1.20	4.0	59.3
7	1.01	3.4	62.6
8	0.86	2.9	65.5
9	0.76	2.5	68.1
10	0.68	2.3	70.3

Given these Eigenvalues, selection of the eight factor solution was also made on the basis of selecting the solution that most reflected the outcome of the qualitative stage of the research.

In summary, the 8 factors are characterised by the following attitudes. Respondents were asked to rate each statement for importance in terms of riding a motorcycle/ scooter/ moped using the following 5 point scale: Very important / Quite important / Neither important nor unimportant / Quite unimportant / Not at all important.

Power of the bike	Having much more power than in a car the same price? The feeling of acceleration? Going really fast? Being able to get away faster than people in cars?
Belonging	A sense of belonging and camaraderie? A sense of heritage or tradition? Riding is part of my identity? Feeling at one with the machine? The social interaction with others who ride?
Relationship with the bike	Heightened awareness of everything around me? Understanding the motorcycle and taking care of it? Feeling totally relaxed on the motorcycle? Learning new things and getting better? The feeling of keeping the motorcycle balanced?
Self sufficiency	Not having to rely on others? Being able to get to places quicker? Saving on fuel and parking? Not having to bother about anyone else?
Sensations	Being exposed to sounds and smells? Feeling the wind rushing past you? Feedback including noise and vibration? The chance to enjoy the weather and the scenery?
Challenge of riding	Never knowing what is going to happen next? The challenge of testing myself and my abilities?
Showing off	Demonstrating my skills to others? Pitting myself against others? The fact I look good on the motorcycle?
Release	Getting away from everyday life? The feeling of exhilaration? The sense of achievement after a good ride?

B.3 Cluster Analysis

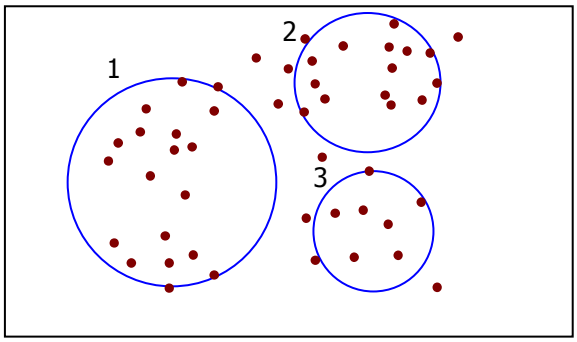
B.3.1 Methodology

K-means was the methodology employed in the clustering of the data It is the name given to a particular clustering algorithm which allocates respondents to a cluster / segment on the basis of the Euclidean distance from the 'centre' of each cluster. In essence, each respondent is assigned to the cluster with the smallest distance between it (the cluster centre) and that respondent. The cluster centre is defined as the average point of all the respondents in a given cluster, which is actually the mean of all the dimensions or variables across all respondents in a particular cluster.

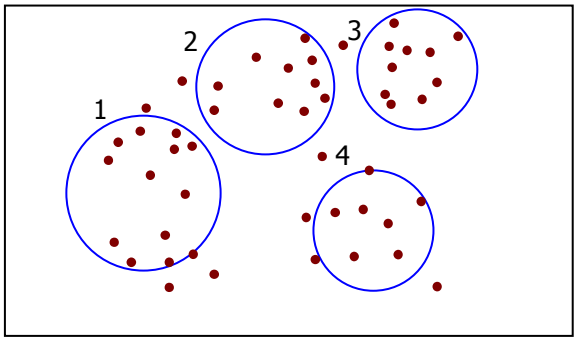
In order to run a k-means cluster analysis, we must specify in advance the number of clusters that we wish to model. The algorithm then 'shifts' these cluster centres around by re-assigning respondents to different clusters, each time reducing the overall aggregate distance between the cluster centres and the respondents in them across all clusters. This continues until convergence is achieved, i.e. it is no longer possible to reduce the distance any further, given the existing centres. The last point is actually important to note – as it is **not** stating that there is no other possible placement of the cluster centres possible that has a lower total distance, only that it is not possible to change the existing combination without increasing the distance. In mathematical parlance, this is known as a local minimum and is distinct from a global minimum, which is the set of centres from which it is not possible to reduce the distance at all.

In k-means, it is possible for respondents to change cluster membership as we change the model using different number of clusters. In the diagrams below, the first symbolises a three cluster solution. The brown dots represent respondents (in a simulated two-dimensional space) and the blue circles represent the cluster centres. (In fact cluster centres are actually only one point, just like a respondent, but are represented here as circles so that it is easier to visualise which respondents are assigned to which clusters.) Note in the four cluster solution, clusters one, two and three comprise respondents who make up clusters one and two in the three cluster solution. Hence it is possible for a respondent to be in the same cluster as another in cluster one in the four cluster solution, but be in a different cluster in the three cluster solution.

Three cluster solution



Four cluster solution



Prior to the clustering procedure the data was checked for poor responses. Only 20 respondents were removed on the basis that they appeared to give a "flat" pattern of response across the input questions, i.e. given the same response across all 30 statements, indicating that they had paid little attention to the questions and their answers could not be trusted. The majority of these 20 respondents gave the response "Very important" for all statements. This means that the segmentation was based on the 98% (999) respondents who were able to discriminate across the 30 statements on which the segmentation was based. Being able to base a segmentation on as many as 98% of a total sample is well above average for studies of this type.

B.3.2 Selection of Cluster Solutions

A number of different cluster solutions were considered and two alternative solutions selected, a five and a seven factor solution. Both solutions comprised clusters of sufficient size to ensure relative stability in the clustering process.

However it was the 7 cluster solution that was finally selected because it delivered the greatest significant differences when cross analysed by the Factors and the How, When and Why motorcyclists ride and purchase their equipment – the prime focus of this investigation.

B.3.3 Stability of the clusters

Stability of a cluster solution is a fundamental part of any cluster solution. A stable solution refers to a number of things. Firstly that the cluster solution selected is robust, that the segments are clear and appear even if there are slight tweaks or alterations in the dataset. Secondly, if the clusters need to be tracked over time, that they are still measurable over time (subject to their still being in actual existence). Thirdly, if respondents need to be post-allocated, that their segment membership is correct and makes sense in the context of the original segmentation.

There are a number of approaches which we use to ensure that the solutions are robust. The first is by extracting a subsample from the full dataset, running the segmentation on that subsample, then comparing the original segment profiles with those obtained in the subsample. The size of the subsample will depend on the size of the overall sample, but typically something around 50 – 75% should suffice. In terms of what we then look for in a robust solution we would wish to see similarity of around 80% or greater to be able to confidently state that the segments are robust. However, that is still a largely subjective judgement as different individual segments will themselves have different levels of stability

In this study the stability of the clusters was tested by selecting several sub-samples of 80% of the respondents and repeating the cluster analysis on these. Crosstabs of the resulting clusters against the original clusters were run and the overlap looked at. The overlap ranged from 63% to 85% (see table below for the 85% overlap) across the sub-samples averaging at 70%. This is considered a good indication of stability of the solution.

		Total sample cluster solution							Total	
		1	2	3	4	5	6	7		
Sub-sample	1	**104**	0	1	0	0	0	5	110	
	2	0	**63**	0	1	0	4	6	74	
	3	0	2	**108**	3	1	0	16	130	
	4	3	2	1	**181**	4	4	20	215	
	5	0	4	0	0	**125**	0	7	136	
	6	2	1	2	3	0	**75**	0	83	
	7	1	0	8	6	4	15	**31**	65	
	Total	110	72	120	194	134	98	85	813	84.5%

B.4 Application of the segmentation to future motorcycle studies

The size of the sample and the questionnaire coverage of motorcycling issues make this database a first point of call in future research investigations.

Use of Stepwise Discriminant Analysis on the results of this study defines the statements that most efficiently identify the 8 factors identified in the study. These reduced sets of statements can be used in other motorcyclist studies. With each reduction in the number of statements used there is a decline in overall accuracy of prediction. The 72% level of accuracy with which the factors can be predicted using only one in three of the original statements is extremely high for this type of study.

On this basis, allocation of any future sample to the segments derived from this study can be made by the simple addition of this reduced set of 10 motivational statements to the questionnaire

Number of questions:	Importance rating using the following 5 point scale: Very important / Quite important / Neither important nor unimportant / Quite unimportant / Not at all important		Accuracy Overall
10	Not having to rely on others?	Factor 4	
	Pitting myself against others?	Factor 7	
	Feedback including noise and vibration?	Factor 5	
	Getting away from everyday life?	Factor 8	
	A sense of belonging and camaraderie?	Factor 2	**72.3%**
	Feeling the wind rushing past you?	Factor 5	
	Having much more power than in a car the same price?	Factor 1	
	Being able to get to places quicker?	Factor 4	
	The fact I look good on the motorcycle?	Factor 7	
	A sense of heritage or tradition?	Factor 2	

B.5 Conclusions

The segmentation of motorcyclists is this study has been based on attitudes and beliefs that determine behaviour rather than on aspects of the actual behaviour. The resulting segments have been shown to discriminate in terms of variations in behaviour in terms of the How, When and Why motorcyclists ride.

The segments involved are also capable of universal application, and are in this way inclusive of virtually all UK motorcyclists and have been demonstrated to be highly stable.

Passion, performance, practicality: motorcyclists' motivations and attitudes to safety – motorcycle safety research project

The motorcycle safety research project has developed an original way to categorise riders based on their motivations to ride. The classification (segmentation) of the riders was based on thirty statements which were identified during the qualitative phase of the work. For each statement, the riders rated the things which were important to them about riding a motorbike, scooter or moped, on a five point scale, ranging from 'not important at all' to 'very important'. Eight 'motivational factors' were identified from analysis of the responses to these statements, which were used as the basis for the segmentation exercise.

There were 1,019 respondents, and 999 were allocated to a seven segment solution. The seven segments were described as: Look-at-me enthusiasts; Car aspirants; Performance disciples; Car rejecters; Performance hobbyists; Riding disciples; and Riding hobbyists.

The different segments' demographics, attitudes and perceptions of risk were highlighted. The segments were listed with respect to their accident liability scores, with Look-at-me enthusiasts having the highest accident propensity and Riding hobbyists the lowest. A conceptual model was developed for the seven segments and the riders' passion for motorcycling and their relationship to performance were measured. This process was used to describe and quantify their riding behaviour. This research has concentrated on the riders' motivations and risk perception, and self reported decisions with respect to choice of bike, helmet, safety gear and avoiding fatigue.

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