TRAINING CAN MAKE THE PROBLEM WORSE

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UNDERSTANDING THE INCREASING TREND OF MOTORCYCLE FATALITIES: RIDER ERROR, DRIVER ERROR OR TRAINING ERROR?

1. General Introduction

1.1 The problem

Motorcyclists die, there are lots of explanations and responses. When an explanation is however given it is generally siloed and exclusive, researchers look for a single cause and a single remedy. In this paper we highlight the traditional ones, introduce a new one but conclude with concerns over the validity and assumptions on research methodologies and intervention measures. Only when the problem is adequately defined will we become closer to solving it.

1.2 The starting place

Department for Transport collision data records are recorded in a format known as STATS19, these data are often the starting point to understand crashes. However, STATS19 is not designed as a research tool but maintained by police forces to meet national accident recording requirements. They contain details of crashes collected by post incident interviews of drivers and those who have suffered material property damage. Accident databases were one of the first sources to indicate that motorcyclists are amongst the most vulnerable road users groups. However, latterly, investigators have claimed that STATS19 contains direct evidence about why motorcyclists are at an increased risk of a crash and this has driven a series of possibly inappropriate ill founded intervention schemes. The problem is compounded in that those designing the intervention schemes refer back to STATS19 to 'prove' that the intervention scheme worked. A comparison to this approach could be made to the statistical validity that the intelligence of children improves as size of their feet increase, or that when the sun comes up there is a tendency for humans to eat toast. This paper establishes the need to collect accident data that is valid and reliable as a research tool.

Figure 1 Two possible explanations of % breakdown of accident causality

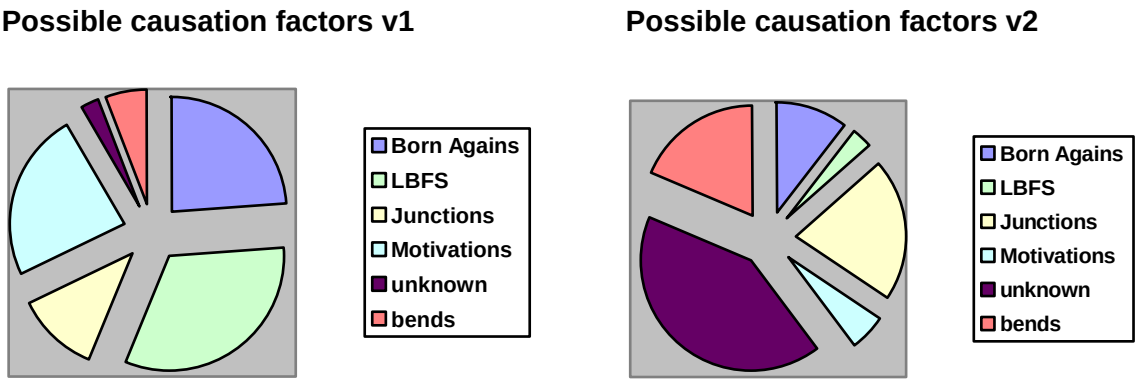

Figure 1 shows an example of the current explanations that are used to explain motorcycle accidents but as can be seen the percentage that each actually contributes to causality is currently unknown.

Overall, there are many different explanations, it is difficult to understand which factor has the greatest impact on our understanding and which intervention scheme can currently provide effective measurable solutions on motorcyclist deaths.

2. Current and traditional explanations

2.1 Look but fail to see (LBFS)

2.1.1 Introduction

Post accident interviews with the offending driver who have collided with a motorcyclist often find that either the driver claims not to have seen the motorcyclist until it was too late (Hurt 1981) or the driver claims to have been 'looking without seeing' (Dahlstedt 1986). The 'looked but failed to see' error or 'looked but did not see' (Sabey and Staughton 1975, Staughton and Storie 1977) refers to a set of circumstances where a driver accounts for an accident in terms of failing to detect another road user in time to avoid a collision. In a review of driver vision and vehicle visibility Hills (1980) describes the L.B.F.S. error as a problem of the misjudgement of speed and distance and incorrect interpretation of information by the driver. He points out that an individual vehicle accident is: *"not normally due to one single cause but, rather is the result of a combination of causes"* (p184). However, when it comes to understanding motorcycle

crashes it is assumed that because the driver claims they did not see them then the solution is to make the motorcyclist more conspicuous. Importantly STATS19 are used as direct evidence that drivers fail to see motorcyclists (e.g. Williams and Hoffman 1977).

2.1.2 Reasons to doubt this as the only explanation

Late detection accidents are a major cause of injury to both pedestrians and vulnerable road users and are over-represented in casualty statistics. The offending driver's statement claiming s/he did not 'see' the motorcyclist suggests the L.B.F.S. error was the likely cause and this has been taken literally. It has been assumed that the driver looked and the motorcyclist was there to be seen but was inconspicuous. Motorcycle accident causality is therefore explained by the motorcyclist being less conspicuous than other road users. Although other factors are seen as important, for example perception of vehicle speed, there is a significant overemphasis on the conspicuity hypothesis as an exclusive explanation of motorcycle accident causality.

Since the early 1970s the conspicuity hypothesis has been questioned. Review articles conclude that no evidence actually existed to support exclusive explanation of the L.B.F.S. error in terms of physical conspicuity for motorcycle accidents (e.g. Wulf *et al.* 1989). Later research has further shown that physical conspicuity is not the sole determiner of a motorcyclist's safe detection. Nevertheless the conspicuity hypothesis is still a major influence amongst accident prevention workers and road safety organisations (ETSC 1997) still argue that a solution to the L.B.F.S. accident is to make the motorcyclist more conspicuous by compulsory Daytime Running Lights (DRLs) even though evidence from countries using DRLs and other conspicuity enhancers is mixed.

Overall there is an over reliance on crash data to suggest that motorcyclist are hit by drivers who simply didn't see them because they were inconspicuous. It's strange to make these claims when the data necessary to validate this is not collected at the accident scene.

2.1.3 What is needed

There is a need to collect accident data that allows researchers to test their hypothesis. Langham 1999 suggests that the level of data needed is that contained in a fatal accident investigation. Hurt *et al* 1981 suggest a similar level of detail in data

collection exercises but suggests that post accident interviews should be conducted by trained scientists. Sabey *et al* 1975 also suggest that the accident investigation should occur at the accident scene. If we are to claim that accidents are caused by someone failing to see a motorcyclists and the remedy is to make them more conspicuous then we need to collect data that measurers conspicuity.

2.2 Junctions

2.2.1 Introduction

Junction collisions are reported in STATS19 as amounting to 61% of all collisions (DETR, 2001). Junction collisions in Sussex recorded by STATS19 for fatal only motorcycle collisions (2000-2002) accounted for 43.5% of these type of incidents. This figure initially appears to compare well with the findings of EuroRAP 2004 where it was stated that junctions account for 40% of motorcyclist fatalities. With such potential findings it appears clear, invest in junction layout or reduce the number of junctions and the problem will be greatly reduced. But is this a junction layout issue or a human factor issue that tends to support the L. B. F. S. hypothesis or is there yet another factor involved?

2.2.2 Reasons to doubt this as the only explanation

So why are there fewer motorcyclist fatalities at junctions (40%, EuroRAP) when compared to the overall collision data (61%, DETR)? It is likely that this can be explained in the following ways. First, junction collisions have a greater frequency in speed restricted urban environments than in non-urban national speed limit roads. In urban incidents there is a greater exposure to junctions and in these incidents the car driver is primarily at fault whilst the motorcyclist is often an innocent victim. Whilst these incidents form the majority of the motorcyclist collisions, due to the lower speeds involved rider's rarely die from them. The majority of motorcyclists are however killed on non-urban national speed limit areas where the principal causes are excess speed, careless/dangerous riding and lack of judgement. In these incidents the primary error has now changed from the fault of another to the fault of the motorcyclist. These fatal incidents do not necessarily require the interaction with others usually associated at junctions. This constitutes a clear change in error type and attribution for error from the car driver in an urban damage only or injury collision to an error by the motorcyclist

in a non-urban fatal collision. Unfortunately this change in causation in not generally accepted by motorcyclists who commonly attribute causality to other road users. This may have significant consequences in rider bias of perception and subsequent intervention measures that do not address rider attitude.

Second, irrespective of these factors is that the current method of recording junction data used in STATS19 over represents the problem. When the Sussex statistical data for fatal collisions (43.5%) was further studied using detail contained within the comprehensive collision investigation reports and adjusted to whether the junction was a contributory factor a different pattern emerged. With the benefit of enhanced data assessment of actual junction interaction the junction involvement for fatal motorcycle incidents reduced to 17.4%. The analysis suggests that STATS19 data tends to overestimate the number of junction incidents by the inclusion of events where the presence of the junction was not a contributory factor. The involvement of the junction is an artefact of the data and if used in isolation may inadvertently portray unreliable information. Intervention measures or improvements to junction design may not lead to the reductions anticipated.

2.3 Bends

2.3.1 Introduction

Another reason to doubt the veracity of accident data sources is illustrated by (Sexton, Fletcher, Hamilton 2004) who reviewed motorcycle accidents and casualties in Scotland 1992-2002, the study highlighted the increase of motorcycle collisions on left hand bends, in addition the report also highlighted the loss of control on non-built up roads particularly involving sports motorcyclists. Further research into this area is currently being undertaken (personal communication).

2.3.2 Reasons to doubt this as the only explanation

Sexton *et al*, 2004, relies on data from STATS19 and additional information of engine size and collision description from police forces. This is helpful and highlights that enhanced statistical data is available on individual collision investigations but is not collectively recorded. Whilst the description and variation of vehicle types were identified they appear not to have been reported in the analysis for bends. For example, Labbett, 2003 highlighted that touring and classic motorcycles were rarely involved in fatal collisions. The proposed changes to introduce motorcycle capacities

in excess of 500cc in the next generation of STATS19 is unlikely to resolve this vehicle description issue. Sexton *et al,* 2004, also highlighted that 68% of sport motorcyclist accidents involve loss of control of the vehicle on non-built-up roads. When this is considered it is perhaps not surprising why motorcyclists on non-built-up roads, generally irrespective of the causation factor, are reported to lose control. A motorcycle by its nature is predominately a 2-wheel vehicle and therefore unstable. In any collision report, unless the vehicle was abruptly and prematurely stopped by an immovable object, such as a car pulling into its path, at some point in the collision sequence it is likely that the motorcycle will fall over and therefore give rise to the statistical observation the vehicle lost control. Collision statistics of this type have a tendency to lead many training and safety organisations to focus on supplementary training for rider control. These losses of control incidents may have little to do with the ability of the rider but are again an artefact of the recording and interpretation of the collision data.

If as has been suggested that only a particular class of motorcyclists, sports riders, are predominantly involved in left hand bend collisions then does the issue relate to the bend or is it a consequence of speed or some other human factor more directly related to rider attitude and behaviour?

2.4 Motivation and risk taking

2.4.1 Introduction

Is it reasonable to assume that all groups of motorcyclists have the same level of motivation and risk taking. Given that the majority of fatal motorcycle collisions involve sports motorcycles what motivates a rider to purchase a sports motorcycle?

Labbett, 2003 identified that there was a significant behavioural difference between different groups of motorcyclists. The identified high risk group for fatal collisions, sport motorcyclists, were shown to exhibit higher levels of sensation seeking when compared to touring or classic riders. Sensation seeking is highly correlated to risk taking and associated to increased risk of collisions (Zuckerman, 1994). In addition sport motorcyclists exhibited a significantly enhanced desire for performance and the thrill of speed, speed is a factor highly correlated to sensation seeking (Furnham & Saipe, 1993) and increased risk of collisions (Wilson & Greensmith, 1983; Wasielewski, 1984). It is possible that sports motorcyclists may have been primarily drawn to motorcycling to fulfil their sensation seeking needs and thrill of speed rather

than the desire of the motorcycle experience. The combination for sensation seeking and risk taking is therefore a dangerous mix in particular when fuelled by elements of the motorcycle media that cater for the needs and desires of this type of rider. Would however enhanced training for vehicle control address the issue?

It is often suggested as a treatment to reduce the level of motorcycle fatalities that increased level of training may assist. Caution needs to be exercised at this point, what is it that is intended to be trained? For example, an evaluation in Scotland of the national police based motorcycle initiative, 'Bikesafe' (Ormston, *et al* 2003) found no link to casualty reduction. However, a trend suggests that students post Bikesafe tend to ride slower in 30mph areas but faster in 60mph limits. Haworth *et al*, 2000 provided an evaluation of rider training courses in Victoria and reported that riders who scored higher on vehicle control skills in some tests had more crashes later and that newer tests requiring higher levels of vehicle control skills did not reduce crash rates. Lack of vehicle control may account for the final moments of a significant number of many motorcycle fatal incidents but increased levels of vehicle control and rider ability may not be addressing the root cause of the sequence of events that led to the particular incident. Consideration perhaps needs more focus on the reason for the rider to embark on motorcycling and importantly their choice of motorcycle. A rider that has taken to motorcycling to satisfy a desire for sensation seeking is likely to have a substantially different attitude and behaviour than a rider that has a taken to motorcycling as an alternative form of transport. If a rider with higher sensation seeking tendencies is trained to ride the optimum lines of bends, increased ability may result in increased speed at which the bend is negotiated while personal level of risk remains constant. An appropriate observation by Näätämen and Summala, 1976 highlighted that riding is after all self paced. Skewed safety judgements, personal risk levels and rider illusion of control potentially pose the greatest risk to motorcyclist safety. Training if focused on vehicle control is therefore unlikely to address the rising number of fatal collisions from this high risk group. Understanding the motivation to ride and dealing with the attitude and behavioural aspects of performance and sensation seeking must be considered as priority aspect of any training.

2.4.2 Reasons to doubt this as the only explanation

The data in the study by Labbett (2003) addresses the previously highlighted shortcomings of STATS19 but as it was localised to the South East of England, it lacks the ecological validity of the national motorcycling population. Whilst it maybe simplistic to suggest that training may increase the risk of collision for some groups others may develop significant benefit.

It should be remembered however that addressing rider motivation and risk taking is again only addressing a single causality.

2.5 Born Again

2.5.1 Introduction

Much is written and suggested by the media that the 'Born Again' motorcyclist is the cause of the significant increase in motorcycle fatalities. But what is a 'Born Again' motorcyclist and can this suggestion be validated? A common perception of this mythical rider is a male aged in his 40s, perhaps someone that used to ride one of the last British breed of motorcycles in the 1970s or perhaps a Honda 400 four? This rider, now with a family but a disposable income, has rediscovered the urge to own and ride a motorcycle. In engineering terms of vehicle performance much has changed between the bikes of the 1970s and the current motorcycle class of the 21st Century. The perception of the 'Born Again' school of thought is that these riders are poorly equipped to deal with the performance of the modern machines and as a result on their return to motorcycling they are more likely to be involved in a fatal collision. Tending to support this is the average age (35 years) of those being killed in significantly increasing numbers each year that ride high performance sport motorcycles. But is this there any actual evidence to support the 'Born Again' hypothesis?

2.5.2 Reasons to doubt this as the only explanation

The very end of the 70s decade is now at least 23 years ago. Labbett, 2003 found that returning motorcyclists that had been absent from riding for more than 15 years riders were tending to ride classic or touring classes of motorcycle. So with that in mind are the returning motorcyclists to touring and classic motorcycles responsible for the increasing number of fatal collisions? The answer appears to be no, analysis of Sussex Police motorcycle fatalities database between 2000-2002 indicates that riders of touring, classic or trial motorcycles are rarely involved. The common perception of the 'Born Again' motorcyclist being responsible for the increasing trend does not therefore appear to fit.

'Born Again' is a non defined but popular terminology commonly associated with older riders. What perhaps has not been considered is whether the 'Born Again' rider terminology annexes older riders that never rode in their youth. For example, it is possible that a subgroup of older riders that are experienced car drivers but have never held a motorcycle licence are taking to motorcycling for the first time through a

'direct access' licence scheme. The 'direct access' scheme allows an applicant aged over 21 years who takes and passes a slightly modified test to ride any motorcycle without any further restriction. Labbett indicated that 70% of riders passing their test through 'direct access' purchased a sports motorcycle. What happens to them is not known, as the method of test pass is not recorded by the collision statistics. The success or failure of the direct access scheme is therefore not easy to evaluate. It is however considered by many road safety officers, police and motorcycle groups that riders passing their test through 'direct access' are at least in part responsible for the increase in motorcycle fatalities. The need to study 'direct access' collision statistics of riders is an urgent consideration to assess and understand the relationship and potential for increased rates of fatal motorcycle collisions.

3 Conclusion

The notion that a motorcycle crash has a single cause and thereby single exclusive remedy lacks any scientific worth. Crashes are rare random events that occur when a series of unfortunate events come together to cause a crash. This is widely accepted in understanding motor car collisions but not for motorcycle crashes. Since the 1960s it has been popular to attribute a single and exclusive cause to motorcyclist deaths, only the reason has changed through time. Traditionally, the idea that the car driver was at fault by failing to detect the inconspicuous motorcyclist was the most popular. In recent times this explanation has been replaced with claims based on cursory surveys of crash data summarised in STATS19 that accidents occur on bends, at junctions, or by motorcyclist's lack of experience of modern high performance bikes. However, these claims maybe scientifically flawed. In some cases intervention schemes are constructed without reference to accident data but to solve a perceived problem that has not be categorised or clearly defined. The use of the term 'born again' together with a range of intervention measures, highlights failure to fully understand and address the route causes of the problem.

Our own work investigating attitudes to safety by different classes of motorcyclists adds at this stage another level of complexity and illustrates that a crash can not ever have a single cause.

Overall, many theories have been generated but are over simplistic, poorly thought through, and are often specific to a locality. Because the theoretical stance is impoverish and poorly based on the facts the subsequent remedies and intervention programs maybe ineffective.

This paper has argued that we need to understand the crashes by collecting more detailed accident data. This has two benefits:

1) Provides a greater understanding of the crash

2) Provides a way of measuring the success of intervention schemes.

Above all, there is an essential need for interested parties to communicate with each other and combine their ‘pet’ theories and intervention schemes to address the issue nationally, and provide a holistic understanding of the actual problems rather than attempting to deal with a perception of the causes.

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