Road Sharing

Does it matter what road users
think of each other?

Dr Simon Christmas (Simon Christmas Ltd)
Dr Shaun Helman (TRL Ltd)
January 2011

RAC
Foundation

Road Sharing

Does it matter what road users think of each other?

Dr Simon Christmas (Simon Christmas Ltd)
Dr Shaun Helman (TRL Ltd)
January 2011

Acknowledgements

About the Authors

Simon Christmas is an independent social researcher with wide private and public sector experience. Past research in the transport sector has included studies of young drivers and pre-drivers, motorcyclists, cyclists, van drivers, freight operators and drivers in general (in relation to seat-belt wearing and CO_2 reduction).

Shaun Helman is a principal psychologist at TRL, and a Fellow of the TRL Academy. His research interests include the factors impacting on the safety of new drivers, driver hazard perception skill and its training and testing, perceptual processes relating to motorcyclist conspicuity, driver distraction, and the evaluation of road safety interventions.

Contents

Foreword

Some rivalries are enduring. Manchester United fans despise Manchester City fans. Die-hard Labour supporters cannot abide Conservatives. And it seems many car drivers loathe cyclists – a feeling which is often mutual.

Why is this so? Why do drivers consider the typical cyclist to be reckless and by the same token cyclists view 'the motorist' as inconsiderate and malicious?

Questions like these cannot be ignored in the fields of transport policy and planning, since prejudice leads to antagonism that can seriously jeopardise road safety.

To help address these matters, the RAC Foundation commissioned Simon Christmas and Shaun Helman to explain some of the psychology behind road user interaction, and how perceptions and attitudes translate into actual behaviour.

The authors conclude that analysing the number of collisions on the roads is not the only way interaction can and should be measured. They point to the quality of experience as another yardstick. So too is the attainment of a road user's goal. But these are more subjective areas involving value judgments and require an understanding of people's so-called moral models.

Moral models help explain how one set of road users views another set. The models encapsulate how we expect other tribes on the roads to actually behave and how we think they ought to behave.

Typifying 'rival' road users allows us to take mental shortcuts when we encounter them, maximising the speed at which we anticipate what is going to happen around us.

The trouble is our assumptions might well be wrong. This is because stereotypes are generalisations, yet we all retain traits and characteristics that dictate how we behave. Even as part of a herd we remain individuals.

If the psychological processes employed by road users were better understood, allowance could be made for them when road systems and transport policies are designed.

By offering some theoretical foundations this report provides a useful contribution to advancing the debate on road sharing. As the road network becomes ever more crowded, understanding how we share space – beyond what might be required by formal rules and regulations – becomes increasingly critical.

Stephen Glaister CBE

S. Glaister.

Director, RAC Foundation

Executive Summary

The aim of this report is to inform the RAC Foundation about the existing knowledge base on road sharing.

We propose that the idea of a road user's 'moral model' of other road users provides a sensible focus for research within this broad field. This moral model, we suggest, has two parts:

- A part which attributes psychological characteristics – things like goals, motivations, intentions, attitudes or character traits – to types of road user (defined by observable characteristics, which could include vehicle type, or behaviour).

- A part which attributes moral characteristics – things like rights, responsibilities, and legitimate claims – to different types of road user, in the context of different types of place.

We make use of such a moral model when *explaining* and *evaluating* other road users' behaviour. (Whether moral models also have an impact on our *anticipation* of other road users' behaviour is a difficult question on which, for the time being, we remain neutral.)

In particular, moral models play a role in an individual's judgement of the success of their interaction with other road users. From the individual's perspective, it seems reasonable to distinguish three levels of success in interaction: avoidance of collisions, achievement of goals, and quality of experiences. Success at the first of these levels is a simple matter of fact, but at the second and third levels moral models are invoked. Because people have different goals and different experiential needs and responses, and because not everyone can have everything they want, the best that can be achieved is a *fair* distribution of goal-achievement and experience-quality; a judgement of fairness rests in turn on an assessment of how *reasonable* and *legitimate* the claims made by each road user are.

Research into moral models has a number of potential impacts on policy and practice.

- *Behaviour change.* Moral models could play an important role in efforts to tackle undesirable behaviours (such as aggression), as well as the promotion of behavioural choices to support wider objectives such as better public health, improved mobility, enhanced economic efficiency and reduced environmental impact. Whether they also have a potential role in road safety remains an open question.

- *Understanding the 'customer'.* Moral models offer a new framework for thinking about consultation and research with communities. A better understanding of people's moral models could help policy-makers and practitioners think about the acceptability of interventions and anticipate certain kinds of objections or misunderstandings.

- *Understanding the evolving culture of road use.* Moral models, allied with theoretical understandings of emergent properties and social identity, provide a way to think about and track the culture of road use. A better understanding of moral trends and conflicts could help policy-makers and practitioners spot both opportunities to nudge the system in a desired direction and threats to be tracked and managed.

In order to realise this potential, a first priority for any research in this area must be to start addressing the gaps in evidence and theory and, in so doing, refine and replace the working framework we put forward in this scoping report. With a firmer definition and understanding of moral models in place, further research would be valuable in the following areas:

- Identifying key dimensions which can be used to distinguish between moral models.

- Investigating how differences along these dimensions correlate with other key differences (such as age or primary mode of transport).

- Building the evidence base for the behavioural consequences of different moral models.

- Tracking how moral models change over time – in individuals and across entire populations.

While these tasks are clearly beyond the scope of any single piece of research, however large, we do believe that an initial qualitative study could start to address objective 1 and suggest some initial hypotheses for objectives 2 and 3.

1. Introduction

1.1 Context

The aim of this report is to inform the RAC Foundation about the existing knowledge base on road sharing. A number of broad areas of potential research interest were identified:

- Understand how behaviours of different road users can be more successfully co-ordinated so that 'conflicts' are reliably and successfully resolved.

- Shed light on how different road users see and judge each other to help policy and practice to take action on the misunderstandings that happen between road users, which can lead to 'conflict'.

- Understand how traffic law and infrastructure designed to help resolve conflict between users can be improved by taking account of the 'lore' of the road.

- Establish how views on and perceptions of fairness influence user attitudes about other modes and the provision of infrastructure.

- Establish how efficiency is viewed by the different types of road user and what implications this has for developing shared networks.

In our response, we have sought to find a sensible focus for research within this broad field.

In preparing this report, we have conducted an informal scan of the literature and conducted pilot conversations/interviews with road users to test whether the idea of a 'moral model' proved a useful theoretical framework in practice for the design and interpretation of qualitative research.

1.2 Introducing moral models

Roads are a site of intense interaction between people.

An event as simple and everyday as two cars passing in opposite directions, each keeping to their own side of a road, requires coordination and collaboration between people who may never encounter each other again within a similar context provided by the environment, social norms and conventions, and, of course, the vehicles they are driving.

At the other end of the scale of complexity, many urban roads see large numbers of people using many different modes of transport (including pedestrians) and simultaneously interacting with one another. As a recent report by PACTS (Besley, 2010) puts it, these are spaces in which 'the spectrum of public life is carried out.'

How successful is this interaction?

To answer that question, we need first to offer some kind of definition of success; to do that, we need first to decide from whose point of view we are assessing it. Let's start by considering the question from the perspective of those who are out on the road interacting. From this perspective, it seems reasonable to distinguish three levels of success:

- *Avoidance of collisions.* While there are probably exotic exceptions, it seems reasonable to assume that everyone interacting on the roads is trying to avoid bumping into everyone else.

- *Achievement of goals.* By contrast, different road users have many different goals in their use of the road, not all of them related to getting to a destination.

- *Quality of experience.* Again, road users are likely to differ, responding in different ways whether positively (relaxation, excitement, well-being) or negatively (stress, fear, anger) to different aspects of their experience.

It is worth making an immediate observation on this basic structure which follows from the simple observation that the desire to avoid collisions is universally shared, while goals and experiences are not.

At the first level, interaction is successful to the extent that people are avoiding collisions. If no-one ever collides, everyone gets what they want. Whether or not an interaction is successful is a purely *factual* question, and one for which quantification of the answer is relatively straightforward, through access to recorded collision statistics.

At the second and third levels, by contrast, it is not possible for everyone to get everything they want. The best we can hope for is a *fair* distribution of goal-achievement and experience-quality among those who are interacting. To establish whether an outcome is *fair*, we have to ask whether what people wanted was *reasonable* in the first place. The success of interaction at these levels is not just a matter of quantifiable fact: it introduces an unavoidable *moral* dimension.

For instance, in one of the research workshops conducted as part of our recent research with cyclists and other road users (Christmas et al., 2010), some of the participants complained about the tendency of some cyclists to ride in groups, two or more abreast, making it hard for car drivers to get past.

> 'There's normally a group, they're just well up the road, there are cars going about 20 miles an hour behind them. Move over, I think it's selfish.'

In one of the groups, however, a participant who himself cycled in this way launched a spirited defence of the practice in the face of opposition and questioning from the rest of the group.

> 'You got a group of 20; you can't keep pulling in to single file all the time because it's just not practical. [They can't ride single file all the time] because they're talking and training, you know. They're working as a team. [It's] exactly the same as a slow car. You have to… everybody's entitled; you know… it's not against the law.'

These two responses differ fundamentally. For the first respondent, team cyclists are selfishly making unreasonable claims on the road. For the second respondent, team cyclists are doing something that is perfectly reasonable, and justified by the practical requirements of training: if anything, it is the expectation of drivers that they should always be able to get past cyclists (in a way they cannot always get past other cars) that is unreasonable.

These two different participants have different moral models of the people they interact with on the roads: different stories about why these people do what they do, different views on whether their claims on the road are reasonable, and – as a result – different judgements of whether the outcome is fair.

Put simply, an individual's judgement of the success of their interaction with other road users depends not just on the facts of what happens, but also on their moral model.

Perhaps this insight helps to explain an observation – although, like much else in this report, the observation, the insight and the explanation all remain stuck at the level of anecdote and conjecture until more research of the kind we will be arguing for is undertaken.

The observation is as follows. Ask some road users in London – some cyclists, for instance – how successfully people are interacting on the roads, and you may get surprisingly different answers. We, for instance, have heard everything from 'it's war out there' to 'drivers in London are very considerate'.

What explains this divergence? It's possible, of course, that these two cyclists use consistently different routes, or that one has been luckier than the other. Maybe, however, the difference lies in their having different moral models.

1.3 The structure of this document

So far have we been considering the question of successful interaction from the perspective of those interacting. Those whose job it is to make policies, design interventions and commission research have a (necessarily) different perspective – along with their own goals and definitions of successful interaction.

Even if the above is all true, therefore, it is legitimate to ask: is it something that policy-makers and practitioners need to worry about? Do moral models represent just a (we would say interesting) theoretical framework, or would a better understanding of that framework enable policy-makers to do things differently, and in such a way as to increase the 'success' of road sharing?

To answer this question, we first need to provide some more detail about what is meant by the term 'moral model'; for although, as shall be seen, the construct draws on familiar theories (such as Attribution Theory) and concepts

(such as attitudes to other people), it puts those pieces together in a way which is somewhat innovative.

As a result, the early sections of this report, necessarily, may seem to some readers to err on the 'theoretical' side, and to leave the 'so what?' question unanswered. Readers keen for a 'so what?' could start with Section 4, but may find elements of the argument presented therein hard to follow without the foundation provided by Sections 2 and 3.

- Section 2 provides an overview of the constructs of a 'model' and, more specifically, a 'moral model', relating each to existing theory and ways of thinking about human psychology, and some existing research that we believe sheds light on some aspects of the construct. Without addressing it head on, this section provides a basis for tackling the question: 'What difference do moral models make?'

- Section 3 offers some theoretical perspectives on the ways in which moral models may arise, persist or change in the context of interaction. Without addressing it head on, this section provides a basis for tackling the question: 'What makes a difference to moral models?'

- Section 4 returns to the question of what this may mean at the levels of policy and practice. Why is it worth studying moral models, and what *kinds* of studies would be valuable?

2. What is a moral model?

In this section, we offer an overview of the constructs of a 'model' and, more specifically, a 'moral model', relating each to existing theoretical approaches and research where possible. Our aim is to offer a conceptual construct that is robust enough to enable us, and others, to begin the vital tasks of gathering evidence and building a more robust theoretical framework. We have, of course, drawn on existing evidence and theory where we have found it; where such evidence and theory seems to be lacking, we have used common sense to fill in gaps for the time being, signalling these points with expressions like 'it seems reasonable to think that…' All research has to start somewhere, and we believe the concept of a 'moral model' is a sensible place to start for the time being. We look forward to refining or replacing both the overall concept and the details of its elucidation in the light of evidence.

For ease of presentation, we begin with a brief discussion of the idea of a 'model of other road users' in the (non-moral) area of collision-avoidance in Section 2.1, before plunging into the murkier waters of the 'moral' in Section 2.2.

2.1 What is a model of other road users?

A working model of physical objects

How do people on the roads, in or on a variety of wheeled vehicles, feet or even animals, avoid bumping into each other?

There are many different variables in this picture, but one important capability which the people themselves bring to the mix (perhaps aided or hindered by their vehicles or features of the environment) is the ability not just to see where other people are now, but also to anticipate what they may do and where they may go next.

Let's focus on this one small element of people avoiding bumping into each other. When I am on the road, how do I anticipate what others may do and where they may go next?

To some extent, this capability is down to knowledge of the behaviour of physical objects, including vehicles, based on my previous experience of them.[1] If I see a stationary bus on the road ahead of me, I can anticipate that it won't suddenly rotate or start moving very fast. This is not to say I consciously or unconsciously represent these possibilities in order to rule them out, but I would be extremely surprised if either of them happened. I work on the assumption of a range of physical possibilities and likelihoods for different kinds of objects in different kinds of situations.

---

1   Part of this will be what my experience tells me about what is allowed by the more accessible laws of physics (for example, objects do not spontaneously disappear). The focus here, however, is on my experience of objects and their likely movements within some broadly predictable context – the road system.

In other words I anticipate the future road situation using a *working model* of the behaviour of the physical objects on the road, based on my previous experience of them. The ability to anticipate hazards in this way is one thing that seems to differentiate between accident-involved and accident-free drivers, and it is certainly a skill that increases with on-road experience (for a review, see Horswill & McKenna, 2004).

A working model of other road users

In a similar way, my capability to anticipate what is going to happen on the road may also depend on knowledge of the behaviour of human beings – assumptions about psychological possibilities and likelihoods.

For instance, if the stationary bus is at a bus stop, in the hours when bus services run, I may both anticipate that the bus is likely to start moving again at some point, and be wary that it will do so without indicating, again possibly because I have experienced this before.

It is not, however, a bus that communicates (or does not communicate) its intentions by indicating: it is a bus driver. In anticipating the future road situation in this case, I seem to use a working model of the behaviour, not of physical objects, but of *other road users* – based, as before, on my previous experience of them.

As well as drawing on a working model of the behaviour of physical objects, our ability to avoid bumping into each other on the roads seems likely to rely on such a working model of *other road users*.[2]

Consider, by way of contrast, the familiar situation when two people walking towards each other engage in a moment of synchronised sidestepping before working out how to get past each other. In this case, one might argue that it is precisely the lack of a working model that causes the problems: neither person has an expectation of the direction in which the other will step. (There is more to be said about this example: for instance, the relationship between anticipation and convention, a point to which we shall return in Section 3.)

How can we best conceptualise working models?

For the immediate purposes of this paper, we are going to use a deliberately simplistic approach which sees a model as comprising a large number of

---

2   Another example of this is an anecdote from one of the report authors (SH), who a number of years ago was privy to details of a commentary drive from some police pursuit drivers in Oxford, England. On turning down a street on which one of Oxford University's colleges stood, the police driver commented that a major hazard in this road was pedestrians looking the wrong way when they stepped into the street; this, he reasoned, was due to that fact that the college in question held mainly overseas students, whose experience in their own countries tended to be that vehicles drove on the right. Again the 'priming' of his anticipation was partly based on an understanding of the people involved – at least subjectively it went beyond just a description of the behaviour.

generalised types[3] (e.g. 'bus driver') each associated with and/or defined by a number of characteristics (e.g. 'sits in the driver's seat of a bus', 'stops at bus stops to pick up passengers, then continues on route', 'may not always indicate before pulling out').

These types – which may nest or intersect – serve as heuristics, or mental shortcuts, which maximise the scope and speed of our understanding, albeit at the risk of getting things wrong some of the time.

The use of a model can be seen as comprising two steps:

- Identification of a person as a member of type X on the basis of one or more characteristics.

- Attribution to that person of other characteristics associated with type X.

For instance, in the example above, I identify a person as a 'bus driver' on the basis of the only characteristic that is actually visible to me: the fact that they are sitting in the driving seat of a bus. On this basis, I attribute to them the characteristic 'may not always indicate before pulling out'.

For all I actually know, the person in the driving seat might *actually* be a member of a gang of bank-robbers, about to turn as suddenly as he can into the traffic to create a diversion. The heuristic types in my working model usefully spare me from wasting valuable processing time and energy on bizarre (and, crucially, really unlikely) possibilities like this – usefully, that is, until the day I encounter said gang of bank-robbers.

Caveat: abstractions and brains

It is very important to stress that this simplistic description of a model as comprising a large number of types is a *theoretical abstraction* – one of the many elements of the discussion that stands in need of future improvement.

In reality, our ability to anticipate the behaviour of other road users almost certainly depends not on a single model lodged somewhere in our brains, but on the interaction of many different systems and the knowledge they embody.

It seems reasonable to assume that these systems, collectively, produce results that are *somewhat like* the results of the simplistic model described above. This assumption is what makes the simplistic approach good enough for current purposes.

---

3   There is a fairly obvious connection here between our concept of a 'type' and the psychological concept of a 'schema'. Nevertheless, we will continue using the term 'type'. The concept of a 'schema' covers a far broader range of cognitive structures containing generalised knowledge; and in this context the everyday term 'type' is more self-explanatory.

In actual interactions, however, the devil may lie in the details; and even small differences – in response time, for instance – could make a crucial difference to whether two people avoid a collision or not. Moreover, the types of processing involved (that may lead to these differences in response time) may depend on a number of factors.

One example comes from Walker (2005a) who found that, when describing pictures of road scenes containing cyclists and pedestrians people used 'personalised' words in their descriptions almost 100% of the time (e.g. 'a lady is waiting to cross the road' or 'a cyclist is turning right'). On the other hand, words referring to vehicles were almost always used when cars and other motor vehicles were present (e.g. 'a car is turning left'). When motorcyclists were in scenes, they were referred to approximately half of the time with personalised words, and half of the time with 'vehicle referent' words. Walker suggests that this difference in the language used by people hints at a fundamental difference in the way in which they view different types of road user, depending on how easy it is to conceptualise them as a 'person'.

Of course it is one thing to claim that people hold different attitudes towards and models of different road users. It is another to claim that these have a direct impact on interactions. However, there is evidence that this is the case, and there are psychological mechanisms that explain why. Walker (2005a) argues that when road users are viewed and interpreted as 'people', automatic brain processes related to social cognition (e.g. face and gaze processing) are invoked in the viewer. Other work by Walker and his colleagues (2005b) has shown that such processing may slow the decisions made by drivers when interpreting the intentions of vulnerable road users such as cyclists; when visual attention is focused on the face of cyclists and on establishing eye contact and gaze direction, decisions about whether or not the cyclist is turning across the driver's path are slower than when such processes are not involved.

Walker's research is one example from a disparate body of work that has relevance to the concept of moral models. However, this body of research has not previously been drawn together into a theoretical framework.

Identification and attribution

The simple example of a model used to anticipate others' behaviour allows us to make some useful observations about the operation of working models.

If we first focus on the identification step, it seems reasonable to assume that there are two basic types of observable characteristics on the basis of which a person may be identified as of a particular type (although context can also play a critical role):

- Observed behaviour; and

- Physical attributes.

Physical attributes obviously include things like the way people look, how they are dressed, and so forth. On the road, however, the most salient physical attribute is likely to be the type of vehicle (if any) the person is using. In many cases, this will be the *only* visible characteristic of the other person – as in the example of the bus driver above.

Unlike the identification step, attribution is *not limited to observable characteristics*. Having identified a person as belonging to type X, we may attribute to them all sorts of characteristics that are unobservable in principle as well as practice, such as:

- Psychological characteristics – things like goals, motivations, intentions, attitudes or character traits; and

- Moral characteristics – things like rights and responsibilities.

It is attributed characteristics such as these that make up a moral model.

2.2 What makes a model a moral model?

Psychological characteristics: attribution and stereotypes

Explaining and evaluating other people's behaviour by attributing psychological characteristics to them is an everyday human activity, not the preserve of psychologists, and one that is studied by an area of psychology called Attribution Theory.

The evidence suggests that the mechanisms employed in making such attributions go far beyond the kind of simplistic model of types we have been discussing. Kelley's covariation model (1967), for instance, suggests that people also consider information such as whether the same person does the same thing in similar or different circumstances.

In our interactions on the road, however, we typically lack this kind of information about other people, whom we encounter, for the most part, fleetingly and anonymously. It is only at the level of types that we could consider consistency across situations.

And in fact, even when we *do* have more information to work with, the evidence for our use of types – or stereotypes as they are better known in this context – in attributing psychological characteristics is compelling. One often-cited example is the influence of factors such as physical attractiveness and race on assessments by mock jurors regarding guilt and recommended punishments for mock crimes. It has been shown that in terms of the likelihood of being found not guilty, defendants are at an advantage if they are physically attractive; in addition, racial characteristics can lead to harsher punishments for some types of crime (Mazzella & Feingold, 1994).

That stereotypes of different kinds of road users exist is unquestionable: indeed, the one type that does *not exist* in everyday parlance is that of the undifferentiated 'road user', a phrase that had to be invented.

Despite the intuitive appeal of the idea of different road user stereotypes, we know surprisingly little about which people, and how many, hold what stereotypes about whom, although some research has been done.

Basford et al. (2002: 1) for example found, amongst other things, that 'when drivers encounter cyclists in circumstances that cause them to slow or deviate… their estimation of the cyclist's discourtesy increases, regardless of the cyclist's actual behaviour'. Even this relatively rare piece of research on stereotypes, however, concludes that the best framework for future research in this area is the Theory of Planned Behaviour, a theory that puts attitudes to behaviour, not attitudes to people, at the heart of explanation.

More recently Musselwhite et al. (2010) have carried out a large qualitative study of attitudes towards road user safety. Musselwhite et al. found that although people have multiple identities as road users (pedestrian, cyclist, car driver etc.) they tend to hold only one road user 'identity' at a time (usually 'car driver'). In addition, different risk-increasing behaviours were attributed to different types of road user; cyclists, for example, were viewed by car drivers as one of the most unsafe road users, partly due to perceptions of their 'aggressive' behaviour such as weaving in and out of traffic. Interestingly, it was also found that car drivers categorised cyclists into three distinct types (professional cyclists such as couriers, commuters, and those cycling for fun) and attributed different behaviours to these; professional cyclists, for example, were seen as the greatest risk, due to their excessive rule breaking and risk taking.

Anticipation vs evaluation

Clearly, road user stereotypes exist. Why then have they not received more research attention? Part of the answer may lie in the combination of two factors: (i) a justifiable focusing of research energy on road safety, and (ii) serious questions about whether stereotypes are actually relevant to this topic.

Earlier, in order to introduce the idea of a model of other road users, we used the example of a bus driver. In anticipating that a bus driver might not indicate before pulling out, it was argued, I *seem* to use a working model of the behaviour of other road users.

But do I *actually* use one?

So long as we are concerned only with models as a theoretical abstraction, this question can be set to one side. But, as we also noted earlier, when it comes to the details of real interactions, the devil is in the details. The processing that goes on in the moments that can be critical to avoiding a collision could indeed involve activation of a model of the behaviour of bus drivers. However, it might

be that we form a more direct connection between a bus and a likely event, and so behave as *if* we activated such a model without *actually* having to do so?

There appears to be an important distinction to be made here between the role of models in the activity of anticipation (before the event) as opposed to the activities of explanation and evaluation (after the event).

The attributions studied by Attribution Theory are part of the process of consciously explaining and evaluating behaviour (as were most of the stereotypes explored by Basford et al. (2002)). By contrast, the anticipation of future road situations that underpins skills like hazard perception seems far more likely to involve implicit, almost unconscious processes – processes which may be very different in their operation from the explanations given by the same person after the event.

It is not hard to see how stereotypes can play a part in decisions which allow time for processes such as explanation and evaluation to be involved, such as who to hire for a job, whether someone is a criminal, or who was at fault in an accident. It is much less obvious that they play a role in the mechanics of avoiding collisions; they seem more likely to play a role in our *recording* of collisions – for instance, the 'contributory factors' in STATS19 (Department for Transport, 2010b).

This is not to say that they definitely do *not* play a role. For instance, stereotypes can be linked to powerful emotions (imagine your feelings meeting different kinds of people in a dark alley at night) which in turn might have direct consequences for behaviour about which we understand little in a road safety context.

The question has not yet been settled either way by research, though some fascinating studies have been carried out. That our behavioural responses to

different types of road user can be influenced by characteristics of that road user is amply illustrated by a now famous study by Walker (2005a), which established that when a male cyclist was wearing a blonde wig (so as to appear female), drivers passing him afforded him more room than when he appeared male (by not wearing the wig). Even if stereotypical attribution of characteristics by gender is not directly involved in this behaviour, the research raises important questions. How and why does the link between assessment of gender and response arise in the first place? Are stereotypes involved in its genesis and/or maintenance, even if they play no direct role in its actual operation?

Equally ambiguous from the point of view of interpretation are various findings that relate to drivers' observation skills around motorcyclists. Brooks and Guppy (1996), for instance, found that car drivers who had relatives who rode a motorcycle were less likely than average to be involved in a collision with a motorcyclist. Recent data from Crundall et al. at the University of Nottingham (in press) are also relevant here: car drivers who also have experience as motorcyclists have a qualitatively different scanning behaviour with regard to motorcyclists at junctions when compared with other experienced car drivers and novices. On the basis of findings such as these, the Department for Transport (DfT) Think! team has argued that 'empathy with motorcyclists is important' and, in the *Named Riders* campaign of 2010 (DfT, 2010a), sought to encourage drivers to see the individual human being behind the stereotype. This is a plausible reading of the findings on which it is based, but it is not the only possible one; there are likely to be multiple mechanisms by which experience with (and as) different types of road user can affect interactions with those road users.

For example Crundall et al. (2008a) explored the ways in which attitudes to motorcyclists changed with both general on-road experience and also 'dual-use' experience (i.e. experience as both a car driver and a motorcyclist). A scale was developed to measure different aspects of these attitudes, and how they varied with experience. Four different aspects of attitudes were measured: negative attitudes towards motorcyclists (e.g. 'When a car and a motorcycle collide it is typically the fault of the motorcyclist.'), empathic attitudes towards motorcyclists (e.g. 'I have similar personal characteristics to the average motorcyclist.'), awareness of the perceptual problems car drivers may experience when looking for motorcyclists ('Motorcycles are easily hidden from view by parked vehicles and other parts of the road environment, e.g. buildings or overgrown vegetation.'), and knowledge of the spatial requirements of motorcyclists (e.g. 'When a motorcyclist overtakes a car at 40 mph what size of gap should be left between the car and the passing motorcycle in order to remain safe?'). Although only based on an initial version of the scale, evidence was found that the effect of experience was different for these different aspects of attitudes, and for different types of driver. For example, female drivers showed improvements in negative attitudes with general driving experience, but males showed only modest improvements with general driving experience and instead showed large changes with motorcycling experience. Although

an extremely relevant area when it comes to moral models, more research will be needed to establish the impact, and mechanism of impact, of having a motorcycling relative (or motorcycling experience) on car drivers' interactions with motorcyclists.

In this paper, we remain neutral on the question of the wider role potentially played by moral models in anticipation and other areas in which automatic processing seems likely to play a dominant role. Similar questions to those raised here about stereotypes may be raised about the relevance of the moral evaluations we will discuss in the next section to road safety. As one cyclist commented on a presentation of our earlier research with cyclists and other road users: 'I don't care if they think I should be there, so long as they see me and don't hit me.' We will not explore possible but speculative responses to this challenge here.

Instead, we would like to focus on the role played by a moral model, including the part that concerns the psychological characteristics of different types of road user, in *explaining and evaluating* other road users' behaviour. Indeed this use is for us the *defining feature* of a moral model.

Moral characteristics

The attribution of psychological characteristics – things like goals, motivations, intentions, attitudes or character traits – delivers one part of what we need to evaluate other road users' behaviour: an answer to the question of *why* they did what they did. That leaves the question of what they *ought* to have done.

The natural way of conceptualising people's views on what ought to be done is in the form of rules, and at first sight there may not seem to be much connection between the structure of the rules and our account of a working model of types of road user.

Rules, one might argue, are all about the rightness or wrongness of *behaviours*: they are more like the attitudes in the Theory of Planned Behaviour than the attitudes that underpin stereotypes. If we want a simple picture of how people store their views on what ought to be done, wouldn't it make more sense to imagine a sort of private Highway Code in their heads?

The best response to this line of argument is provided by the contents page of the real Highway Code, the online version of which starts as follows:

> 'Rules for pedestrians
> Rules for users of powered wheelchairs and mobility scooters
> Rules about animals
> Rules for cyclists
> Rules for motorcyclists
> Rules for drivers and motorcyclists'

Our contention is simply that it is reasonable to imagine that people's views on who ought to be where and doing what are structured in a similar way, around types of road user. The types in question may, of course, be more granular than those above: for instance, observed behaviour suggests that the models of drivers of black taxi cabs in London contain a number of prescriptions which apply only to their interactions with other such taxi drivers. In principle, it is possible that some types may not be linked to vehicle types at all, though it is harder to imagine examples here.

Of course, the rules that any individual attaches to different types of road user in their 'private Highway Code' may coincide only partially with the actual Highway Code.

It seems highly probable that this part of the moral model also employs another kind of typology – types of *place*. Just as planners distinguish between urban rooms and urban corridors, or public spaces and highways, so we may assume that people apply different rules in different places. Again, these rules may not coincide with the actual infrastructure: consider, for example, the *de facto* semi-pedestrianisation of parts of Soho and Covent Garden in Central London.

As well as prescribing behaviour, we suggest that this part of a moral model can be seen as establishing the relative rights and responsibilities of different road users that underpin those prescriptions. At the beginning of this report, we stated that to establish whether the outcome of interaction is *fair,* we first have to ask whether what people wanted was *reasonable* in the first place. We suggest that it is this part of the moral model that underpins an individual's evaluation of the claims made by all those road users on the road they are all using.

Moral characteristics and automatic processing

As noted above, we remain neutral on the question of the wider impact of a person's moral model in areas such as automatic processing: and this neutrality applies as much to moral evaluations as to psychological explanations.

At first sight, the case for moral evaluations having an impact on automatic processing seems even weaker than the case for stereotypes having such an impact. As one cyclist commented on a presentation of our earlier research with cyclists and other road users: 'I don't care if they think I *should* be there, so long as they see me and don't hit me.'

Nevertheless, there are interesting questions to explore here. There is good reason to believe that our sense of what people should do is shaped by our observation of what people do in fact do (a point to which we will return later); even if our moral expectations do not directly influence our predictive expectations, they may share a common cause with them. Like stereotypes, moral evaluations may also have an impact on emotions, with unknown further consequences on the road.

Saints, villains and victims

A moral model, we have suggested, comprises two parts:

- The first links types of people to psychological characteristics which can be invoked in the explanation of their behaviour.

- The second links types of road user to rules, responsibilities, rights and legitimate claims, in the context of different types of place.

There is no reason to suppose that these two typologies coincide perfectly: in fact there are good reasons to suppose they will not. Car driver stereotypes, for instance, may be influenced by factors such as the make of car, but it is hard to imagine someone other than Jeremy Clarkson arguing that the drivers of some makes of car have different rights or responsibilities as a result. Other types, such as a hybrid car driver, may cut across both typologies for some people but not for others.

Nevertheless, the two typologies clearly intersect, and in their intersection lies the potential for a range of saints, villains and victims.

Consider an obvious example: the white van man. Back in 1999, in response to research commissioned by Renault UK which sought to expose this 'gross caricature of reality', the BBC helpfully decided to find some drivers who demurred:

> One driver told the BBC (1999): 'They come right up behind you from behind and flash at you if you don't move out of the way.'
>
> Another said: 'They tend to be on the whole chauvinist pigs that don't look out for cars and pull out at every opportunity.'

Caricatures such as these describe attributed psychological characteristics of the road users being described and the behaviour that is seen from them in the contexts of actual responsibilities and rights. They sit across the two halves of the moral model.

3. Where do moral models come from?

This section offers some theoretical perspectives on the ways in which moral models may arise, persist or change in the context of interaction, drawing on relevant theoretical perspectives.
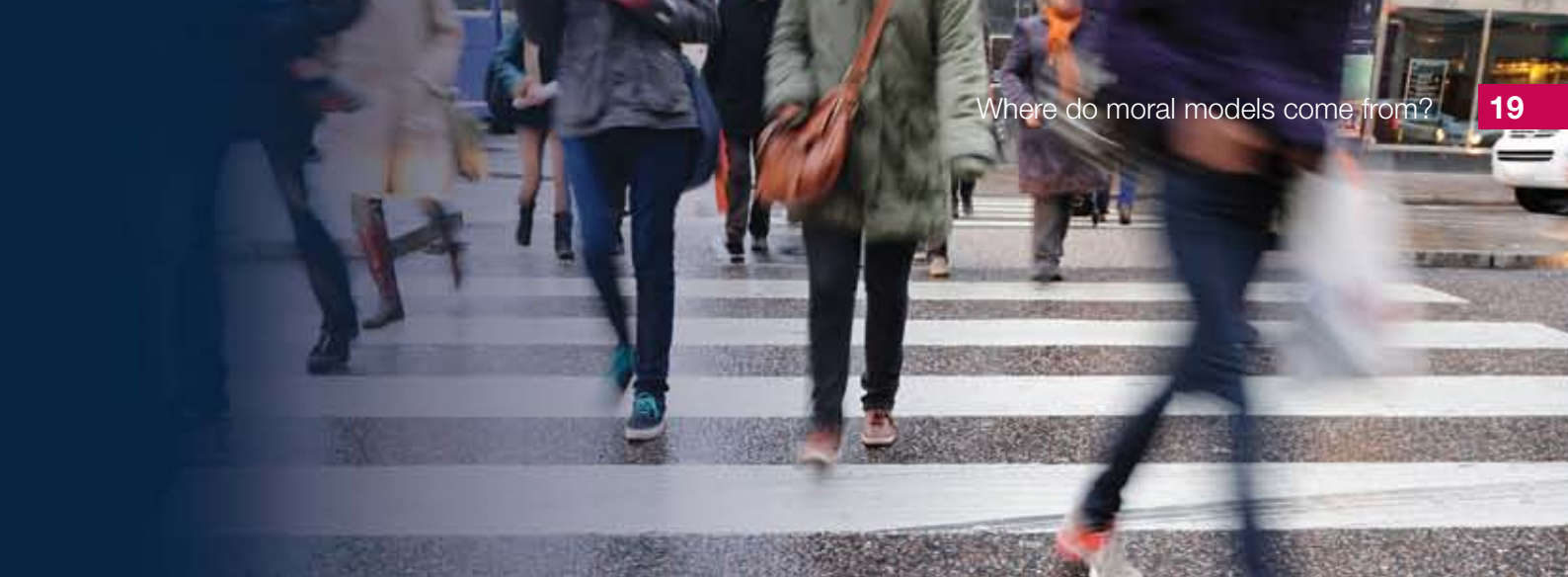
3.1 Emergence

Emergence, consistent behaviour and norms

Earlier, we discussed the common situation in which two people walking towards each other are caught in synchronised sidestepping. Our working model of other pedestrians, we argued, tells us nothing about which way other people are likely to step.

Another way of diagnosing the problem here is to say that we lack a shared protocol for resolving this situation. On the road, by contrast, shared protocols play a fundamental role in ensuring that interactions of this kind can proceed without 'sidestepping', for which there may not be time, or other failures of co-ordination. The most obvious such shared protocol in the UK is that everyone drives on the left – but there are many others.

How do people come to share protocols? Recent years have seen a growing recognition of the ways in which social behaviour (along with the behaviour of many other complex, interacting systems) spontaneously organises itself into patterns. Thanks to basic tendencies among individuals to imitate and conform, sometimes backed up with social mechanisms to punish non-conformity, shared

protocols emerge without anyone setting out to create or promote them. The phenomenon is ubiquitous across human behaviour, with language, culture and fashion being some of the more obvious examples.

It is in this context that we can talk about norms. Through the mechanisms above, norms link what is *normal* (what most people do) to what is *normative* (what people should do). This is why we can explain synchronised side-stepping in two apparently different ways. Caught in the situation, I know neither what the other person will do (what is normal) nor what I should do (what is normative): there is no norm.

A useful concept here is that of a dynamic equilibrium: a persistent state of a system in which the individual parts are constantly in flux. The innumerable complex interactions that occur on the roads every day occur in such a state of dynamic equilibrium, which the norms of the road describe. Such equilibria can arise without the need for any intervention by an 'authority', after which they may persist, change steadily, or suddenly collapse in response to apparently small changes within them.

It is plausible, if unproven, that the spontaneous emergence and maintenance of norms lies behind much of the consistent behaviour we see in humans. It is equally plausible that the same processes are at work on the roads.

Emergence and moral models

How does this relate to moral models?

Norms do not have to require all people involved to do the same thing, as was the case in the example of driving on the left. A simple example of a norm (or set of norms) which does not is 'giving way', which works precisely because the two people involved do different things. Many norms have roles, and so long as each party makes the same allocation of all the other players to those roles (aided, for instance, by white lines on the road), then the norm serves as the shared protocol necessary to make the interaction work.

Critically, for our current purposes, norms may also discriminate (in the morally neutral sense) between *different types of road user*. Indeed, given that they are derived from what is normal, they cannot fail to do so: the normal behaviour of pedestrians is very unlike the normal behaviour of those in cars, for instance.

Given this, it is not unreasonable to think of the norms that describe the dynamic equilibrium state of interaction on the roads as a form of *collective* moral model.

Strengths and weaknesses

This account has a lot of intuitive plausibility. It has two apparent consequences which might give us pause for thought, however:

- On the one hand, the account seems to imply that – at least so long as a dynamic equilibrium state is maintained – everyone using the roads will have the same moral model.

- If the dynamic equilibrium state collapsed or fragmented, and people started behaving in many different ways, this would imply not the existence of many different sets of norms but the existence of none: there would be no 'normal' behaviour any more.

Ideas around emergence help to explain how the behaviour of people on the road can be coordinated through the existence of common norms and moral models, but they do not seem well suited to explaining how people might end up with different moral models.

3.2 Social Identity Theory

In-groups and out-groups

Social Identity Theory provides an alternative account of how moral models might emerge which potentially addresses some of the gaps in the account based on emergence.

At the heart of the theory lies the experimental observation that people have a strong tendency to classify groups to which they belong (in-groups) as being better than groups to which they do not belong (out-groups).

This effect is manifest in a number of ways, and can occur even when groups are defined by much looser characteristics than those that bind road user groups together. For example it has been shown that group membership can influence various behaviours towards out-groups (for example assignment of winnings in games) even when such membership is based on random assignment at the beginning of the study; participants are aware of the accidental manner in which 'their group' has been formed and yet they still show preferential behaviour towards members of their group, and adverse behaviour towards others.

Findings from Musselwhite et al. (2008) are again relevant here; it was found that although almost all car drivers sometimes have a non-driver identity on the road (e.g. pedestrian, cyclist), in terms of their views about road safety and behaviours they tend to default to seeing things from a car driver's point of view, and in any case only activate one of their 'identities' (or in-groups) at any one time. Musselwhite et al. also found that people tend to think that road safety decreases with increasing interaction between different types of road user, and that the road space is seen almost universally as a place for cars. Interestingly, people were also asked about particular interventions to increase road safety, and the 'shared-space' concept was one of these. In general, people were sceptical of the practicality of shared-space approaches, on the grounds that such a concept could not work within the driving culture in the UK: the idea that drivers who were unwilling to give up their 'dominance' of the road space could turn it into a 'free for all' was offered as one example of this. Musselwhite et al. suggested that the reason for this lack of support for the concept is rooted partly in the mindset that safety is all about segregation of different types of road users.

Such evidence is – we would argue – one reason why we need further understanding of moral models. How can we promote cross-modal moral models that are not built on an assumption of a level of segregation which is impractical on modern urban roads?

Emergence and Social Identity Theory compared

Unlike the account based on emergence, Social Identity Theory points toward a world in which different moral models would be the rule. In fact, on this account, it is the possibility of different groups having the *same* moral model that seems in need of explanation.

As a theory, Social Identity Theory also seems better suited to describing some groups of road users than others, owing to the importance it places on an individual identifying as a *member* of a specific group. It is plausible to suggest that drivers of black cabs in London, for instance, strongly identify as such, and that this might help to explain their preferential treatment of other such taxi drivers (by letting them out, for instance). There are clearly also *some* people who identify in an equally strong way as cyclists, or motorcyclists, or car drivers. But there are surely many others – a majority, we would argue – who do not identify in this way with their mode of transport.

3.3   Combining the two frameworks

A plausible story

Given their respective strengths and weaknesses, a combination of emergence and Social Identity Theory holds out some promise as a theoretical framework for understanding the origins of moral models. The easiest way to present this combined theory is as a simple story.

Imagine a city in which, thanks to the processes of emergence, a stable dynamic equilibrium exists on the roads. While stable, however, there is nothing to say that a dynamic equilibrium has to be especially *fair* – as the existence of hierarchical and unequal societies throughout human history attests. Norms can discriminate in the morally charged sense too.

Of course, most people *within* that equilibrium, judging its outcomes by the moral model that derives from it, will judge that it *is* fair – by definition. But a few may be unhappy: the overall equilibrium of the system is consistent with noise and irregularity within it.

Now suppose that something happens to destabilise the equilibrium state. For instance, there might be an increase in the numbers of a type of road user among whom unhappiness is more common. At this point, it seems quite possible that the processes described by Social Interaction Theory might kick in to bind a number of unhappy individuals into a cohesive 'in-group' with their own distinctive and different moral model.

What would happen next? The theories themselves do not tell us: a new dynamic equilibrium state (new norms) might appear, or the old one might suddenly collapse without anything replacing it, or any of a number of possibilities. Of course, if the account above is an accurate description of London, with the part of unhappy road users played by cyclists, then we will find out in the years ahead.

What about the law?

One piece of the jigsaw that is obviously missing from the account above is the definitive statement of what people should actually do on the roads: the law.

Nor is the law just written down: road users get trained in the rules, marketed at to encourage conformity with them, and punished if they break them. They are surrounded by infrastructure and signage which reinforces the rules and communicates what they are meant to do.

It seems unlikely that all this activity has no effect at all on people's moral models. Some norms today may have started out life as laws – though the reverse also holds true: we drove on the left before anyone thought of turning the norm into a law.

What *kind* of effect such activity has may depend on whether its prevailing direction runs with or against the grain of people's existing moral models. Just as moral models underpin judgements about the claims of other road users and the success of interaction, it seems reasonable to assume they will also influence people's response to and acceptance of new interventions.

4. Why study moral models?

Moral models are clearly involved in individuals' evaluations of the success of interaction on the road. As we noted in the Introduction, however, those whose job it is to make policies, design interventions and commission research have their own goals and definitions of successful interaction. Even if the ideas presented in Sections 2 and 3 were substantiated in their entirety, we would still have to ask: 'so what?' In this section, we turn to question of whether moral models are things that policy-makers and practitioners need to worry about. Is it worth studying moral models, and what *kinds* of studies would be valuable?

4.1 Changing behaviour

Changing moral models to change behaviour

One obvious rationale for studying moral models would be to supply the evidence base for behaviour change interventions focused on changing moral models. Such interventions would require both understanding of how moral models influence behaviour, and understanding of how moral models in turn can be influenced.

While the term 'moral model' may be a new one, there are precedents for interventions which operate at least in part in this kind of territory. The Think! *Named Riders* campaign mentioned earlier, for example, aims to get drivers to think differently about motorcyclists, drawing on evidence of how this will in turn influence behaviour. This general approach is not new. For example the AA worked in the 1990s, with the Cyclists' Touring Club and the UK Department for Transport, to develop a leaflet called 'Drive Safe, Cycle Safe' (1994). This work was built on the observation that many drivers are also cyclists.

More widely, there are a number of examples of campaigns which have sought to change behaviour by changing a perception of the rights and responsibilities surrounding that behaviour – for instance, the *Julie* campaign to encourage seatbelt wearing in the rear seat or, outside the world of road safety, the shift in anti-smoking campaigning to an emphasis on the impact of smoke on *other* people.

The idea of changing moral models as a way of changing behaviour should not, we believe, be a controversial one *in principle*.

The more difficult question is: in which areas is this a promising approach to behaviour change *in practice*, one that seems likely to have impact and is therefore worthy of attention and investment?

Road safety

As the discussion in Section 2 made clear, our view is that the case for or against studying moral models in a purely road safety context remains to be made. Making such a case will require a better understanding of how moral models are actually realised in the brain, and how and when they are used.

It may also depend on our asking different questions about the causes of accidents when we track them. For instance, we noted in Section 2 that one route through which moral models might have an influence on road safety

issues is via emotion, but we know little about the direct role played by emotions in accidents, beyond a general acceptance that some emotional states (e.g. anger) are incompatible with road safety outcomes because they can lead to unsafe behaviours such as speeding. The prioritisation of road safety issues at the practical level is (sensibly) driven by road safety statistics; statistics about road accidents are (necessarily) confined to those things which can be recorded at the crash scene. As a result, factors which are harder or impossible to record in such a way as to link them to crash outcomes (such as emotion) are much less likely to be studied except within the community of scientists engaged in more basic research.

It is worth noting, of course, that the same points could have been made about many other 'basic research' issues in the past – and that work on these issues has since led to practical outcomes. For example, an understanding of the basic perceptual processing challenges faced when looking out for motorcyclists at junctions has led to meaningful practical interventions in terms of media campaigns designed to raise awareness of these issues in motorists. Examples include the current Think! *Named Riders* Campaign, and a Transport for London (TfL) campaign of 2008 based on Horswill et al. (2005). (See Crundall et al. (2008b) for a review of the different perceptual and attitudinal processes around this issue.)

Note also that the study of moral models has a far more straightforward application when we turn to the *acceptability* of interventions intended to improve road safety, such as improvements to infrastructure. We discuss this point further in Section 4.2.

Undesirable behaviour

Whereas the impact of moral models on the mechanics of avoiding collisions is questionable, there is a stronger *prima facie* case that moral models are implicated in various kinds of behaviours that are undesirable in themselves – such as aggression and anti-social behaviour on the road.

Changing moral models therefore seems promising as a route to changing this kind of behaviour. The kind of studies required to underpin such interventions is also relatively clear-cut: research which correlates moral models and actual behaviours.

Of course, that leaves unanswered the question of which behaviours one actually wants to change. This question raises issues about the correct scope of intervention by authorities – the limits of *their* responsibilities and rights as one of the agents involved in the interaction on the roads – that clearly go beyond the scope of either this report or research into moral models.

An understanding of moral models does, however, provide a useful framework for thinking about a familiar challenge that arises in this area: deciding what counts as anti-social in the first place. Different people with different moral

models will take different views on this (consider the example of team cycling in the Introduction). In the absence of unanimity, authorities face the difficult challenge of fixing their own moral model, in the firm knowledge that it cannot possibly please everyone. While having an understanding of what road users currently think does not solve this challenge, it does provide crucial evidence against which a judgement can be made. We discuss this point further in Section 4.2.

What is also clear is that authorities cannot simply duck the issue of fixing their own moral model. Every time the lights are re-phased or the streets laid out differently, the changes communicate (implicitly) an evaluation (coherent or otherwise) of the relative claims of different road users on the street. A better understanding of the moral models held by different road users will help in the planning of such changes, and the explicit communications that may be needed to help facilitate a better public acceptance.

Health, environment and mobility

A second area where the study of moral models seems promising is as part of the effort to achieve broader policy objectives – better public health, improved mobility, enhanced economic efficiency, reduced environmental impact – by changing patterns of road use.

For instance, mode choice is critical across all of the above areas, and mode choice, unlike the mechanics of avoiding collisions, is a decision that can involve deliberation, creating plenty of time for moral models to come into play.

Moreover, there are highly plausible ways in which they do have such an impact. Imagine, for example, that I am making a decision about whether to start cycling. We know from many different studies that perceptions of safety will rank high in my decision; one factor in my perception of safety is my evaluation of the behaviour of other road users. Moral models impact on this evaluation in two distinct ways:

- First, the moral models of other road users will influence their behaviour in ways which shape my evaluation of them. Put simply, if I see cases of drivers behaving aggressively towards cyclists or cutting them off at junctions, I may be less likely to start cycling myself. Note that it does not matter whether these situations are actually unsafe, because it is my perception of safety – whether I think I would *feel* unsafe if I were on the bike – that matters.

- Secondly, my own moral model will shape how I interpret the behaviour of others whatever they are actually doing. If I believe that 'it's war out there', I am more likely to anticipate interacting with aggressive and selfish drivers than if I believe that 'drivers in London are very considerate'.

Changing moral models could be a powerful tool for those seeking broader changes in patterns of road use. In this case, however, the tricky question may be establishing whose moral model needs to change.

Research implications

To identify opportunities to change behaviour by changing moral models, we need evidence of the behavioural consequences of different moral models.

At the simplest level, this means investigating the connections between having a moral model and particular behaviours – such as driving aggressively, or choosing to travel by bicycle. Note that, as well as establishing correlations, it would also be important to investigate the direction of any causal relationship.

As the examples above make clear, however, there would also be value in investigating the consequences of behaviours which are themselves consequences of moral models: for instance, does the aggressive behaviour deter others from choosing to travel by bicycle?

4.2 Understanding the 'customer'

What road users want

Behaviour-change approaches conceptualise roads as the site of policy-relevant behaviour. But roads are also a service, provided *for* road users and paid for *by* them through various forms of taxation. From this service-provision standpoint, knowing what road users want is an end in itself.

The traditional consultation approach – sending people plans and asking whether they would prefer a speed hump or a bollard – expects ordinary citizens to make expert judgements about the potential impact of various types of infrastructure or intervention on the thing they are more likely to care about: the success of their everyday interactions with the road system, and with other road users. It seems to us that people are neither equipped nor (often) motivated to respond to questions such as these.

So why not ask about the thing people care about instead?

Moral models provide a framework for asking people questions that might actually make sense to them. Rather than asking what a road should look like, we should ask how people should interact on it – who should and shouldn't be where, what they should and shouldn't be doing. Consultation approaches that focus on these topics are, essentially, researching people's moral models.

Of course, the experts would still be left with the challenge of developing solutions that would deliver what people wanted. In this they might fail. But at least they would then be criticised for failing to get the solution right – and not for failing to listen to what people want in the first place.

Acceptance of interventions

As noted in Section 4.1, authorities – and the individual policy-makers and practitioners that work in them – have their own more or less explicit and coherent moral models, articulated to road users by the phasing of lights, the lay-out of the street, the priorities of traffic police, the semiotics of communications, and in countless other ways.

Understanding the different moral models of road users gives all of us, as individuals working with our *own* moral models, a way of seeing the roads from other perspectives, and anticipating things that to us seem obvious but to others prove objectionable.

Research implications

As part of the process of understanding what road users want and will accept, we need a better understanding of the different moral models that exist and who holds them.

This means identifying key dimensions which can be used to distinguish between moral models, and investigating how differences along these dimensions correlate with other key differences (such as age or primary mode of transport).

In the longer term, it could mean developing a segmentation based on these dimensions and differences.

4.3　Understanding the evolving culture of road use

One reason why undesirable behaviour on the road might matter is that some of it may prove, almost literally, 'infectious'.

Consider, for example, recent experiments by Keizer in the Netherlands (Keizer et al., 2008). In one experiment, passers-by were tempted with a 5 note protruding from an envelope which was itself sticking out of a letterbox. Twice as many passers-by stole the money if the mailbox was daubed with graffiti or surrounded with litter. Similar effects were observed when the researchers left shopping trolleys around or padlocked cycles to railings illegally, with people more likely to do things like litter or take an illegal short-cut. Cialdini's work (2003) on descriptive norms is also relevant here: the basic argument is that if people perceive that an undesirable behaviour (e.g. littering) is nonetheless common, people are more likely to do it.
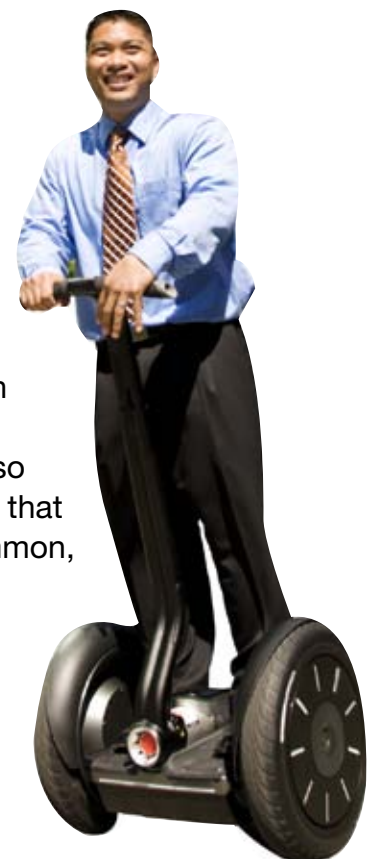
This is still a relatively new field of research, and it would be rash to draw firm conclusions. It seems reasonable, however, to link evidence like this to the discussion, in Section 3, of how norms link the normal with the normative. In that section, we considered two theoretical perspectives on how moral models (and, with them, behaviour) might change over time across an entire population of interacting road users.

We will almost certainly never be able to *predict* how the culture of interaction on the roads will evolve over time, but a better understanding of the moral trends and conflicts that already exist may enable us to spot both opportunities to nudge the system in a desired direction, and threats to be tracked and managed.

Is the behaviour of cyclists crossing red lights in London creating a new set of norms which more equitably shares the road between different types of road users, or dangerously eroding the rule of law on the road? Only time will tell. But if we knew how the moral models of *everyone* on the road were evolving as a result, we might have some clues as to which outcome is more likely, and some indication of what to do.

Research implications

As a contribution to our understanding of the evolving culture of road use, we need to track how moral models change over time – in individuals and across entire populations.

5. Conclusion

The aim of this report is to inform the RAC Foundation about the existing knowledge base on road sharing. Potential areas for research identified in advance were:

- Understand how behaviours of different road users can be more successfully co-ordinated so that 'conflicts' are reliably and successfully resolved.

- Shed light on how different road users see and judge each other to help policy and practice to take action on the misunderstandings that happen between road users, which can lead to 'conflict'.

- Understand how traffic law and infrastructure designed to help resolve conflict between users can be improved by taking account of the 'lore' of the road.

- Establish how views on and perceptions of fairness influence user attitudes about other modes and the provision of infrastructure

- Establish how efficiency is viewed by the different road users and what implications this has for developing shared networks.

In this report we have identified the topic of road users' *moral models* as a sensible focus for research within this broad field. We hope that, in doing so, we have made it clear both why this would represent innovation in research, and how studying this topic would have implications for practice.

Our discussion of moral models, while based on evidence and theory where we have found it, has had to draw on common sense to fill in gaps where evidence and theory are lacking. A priority for any research in this area has to be to start addressing these gaps and, in so doing, refine and replace the framework we have presented in this report.

Over and above that, we have identified a number of other areas in which research would be valuable:

- Identifying key dimensions which can be used to distinguish between moral models.

- Investigating how differences along these dimensions correlate with other key differences (such as age or primary mode of transport).

- Building the evidence base for the behavioural consequences of different moral models.

- Tracking how moral models change over time – in individuals and across entire populations.

While these tasks are clearly beyond the scope of any single piece of research, however large, we do believe that an initial qualitative study could start to address objective 1 and suggest some initial hypotheses against objectives 2 and 3.

6 References

AA, Cyclists' Touring Club & Department for Transport (1994). *Drive Safe, Cycle Safe.* (Leaflet available from the Department for Transport.)

Basford, L., Reid, S., Lester, T., Thomson, J. & Tolmie, A. (2002). *Drivers' perceptions of cyclists* (TRL549).

British Broadcasting Corporation (1999). Rude white van man 'a myth'. *BBC News Online*, 13 January. Retrieved 15 December 2010 from http://news.bbc.co.uk/1/hi/uk/254271.stm

Besley, E. (2010). *Kerb Your Enthusiasm. Why shared space doesn't always mean shared surface, and other stories*. PACTS.

Brooks, P. & Guppy, A. (1996). Driver awareness and motorcycle accidents. *Proceedings of the International Motorcycle Safety Conference*, 2(10): 27–56.

Christmas, S., Helman, S., Buttress, S., Newman, C. & Hutchens, R. (2010). *Cycling, Safety and Sharing the Road: Qualitative Research with Cyclists and Other Road Users*, DfT Road Safety Web Publication No.17.

Cialdini (2003). Crafting messages to protect the environment. *Current Directions in Psychological Science*, 12: 105–109.

Crundall, D., Crundall, E., Clarke, D., & Shahar, A. (in press). Why do car drivers violate the right-of-way of motorcycles at t-junctions? *Accident Analysis and Prevention*.

Crundall, D. Bibby, P., Clarke, D., Ward, P., & Bartle, C. (2008a). Car drivers' attitudes towards motorcyclists: a survey. *Accident Analysis and Prevention*, 40: 983–993.

Crundall, D., Clarke, D., Ward, P., and Bartle, C. (2008b). *Car drivers' skills and attitudes to motorcycle safety*. London: Department for Transport.

Department for Transport (DfT) (2010a). *Named Riders* campaign. Retrieved 15 December 2010 from http://www.dft.gov.uk/think/focusareas/motorcycling?page=Campaign.

DfT (2010b). Road Casualties Great Britain: 2009. London: DfT.

Horswill, M. S. & McKenna, F. P. (2004). Drivers' hazard perception ability: situation awareness on the road. In S. Banbury & S. Tremblay (eds.) *A cognitive approach to situation awareness: Theory and application* (155–175). Aldershot: Ashgate Publishing.

Horswill, M. S., Helman, S., Ardiles, P. & Wann, J. P. (2005). Motorcycle accident risk could be inflated by a time to arrival illusion. *Optometry and Vision Science*, 82(8): 740–746.

Kelley, H.H. (1967), Attribution theory in social psychology. In D. Levine (ed.), *Nebraska Symposium on Motivation*, 15.

Keizer, K., Lindenberg, S. & Steg, L. (2008). The Spreading of Disorder. *Science*, 322(5908): 1681–1685.

Mazzella, R. & Feingold, A. (1994). The Effects of Physical Attractiveness, Race, Socioeconomic Status, and Gender of Defendants and Victims on Judgments of Mock Jurors: A Meta-Analysis. *Journal of Applied Social Psychology*, 24(15): 1315–1338.

Musselwhite, C., Avineri, E., Susilo, Y., Fulcher, E., Bhattachary, D., Hunter, A. & Stockley, R. (2010). Understanding public attitudes to road user safety. Road Safety Research Report No. 111. London: Department for Transport.

Transport for London (2005). *Give motorcyclists a second thought* campaign. Retrieved 15 December 2010 from http://www.tfl.gov.uk/tfl/corporate/media/newscentre/motorcyclists.shtml.

Walker, I. (2005a). Road users' perceptions of other road users: do different transport modes invoke qualitatively different concepts in observers? *Advances in Transportation Studies an International Journal: Section A,* 6.

Walker, I. (2005b). Signals are informative but slow down responses when drivers meet bicyclists at road junctions. *Accident Analysis and Prevention*, 37: 1074–1085.