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Legitimising Risk Taking: Articulating dangerous behaviour on the road

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Abstract

Using a deliberative approach 228 members of the public from four locations in the United Kingdom took part in six focus groups that met on three occasions. Applying a model based on two interlocking sets of theories (Ajzen's Theory of Planned Behaviour and Bronfenbrenner's Ecological Systems Theory) in the analysis of participants' responses, the paper explores the social and environmental systems that an individual interacts with in the articulation of risky behaviours on the road. Participants discussed how taking risks changed over their lifecourse and how they became safer with age. Social norms and perceived behavioural control influence road user safety behaviour through the exchanging of attitudes and younger drivers especially are more likely to embrace the symbolic role of the car. The paper concludes that the nature of identity and culture within risk taking is important when designing interventions on the ground.

Keywords

Introduction

This paper takes the stance that the road environment is a social situation, with actors or agents that interact and influence one another (Haglund and Aberg, 2000). As O'Connell (2002) states the design and construction of the road and traffic system "must not be based on an erroneous model of humans as abstract rational actors, isolated from their social context and operating on purely "objective" criteria" (pg. 201). As such road user safety can be viewed as not just skills-based and rule-governed but also in terms of being an expressive activity (Reason, et al. , 2001). Hence, for a full understanding of road user safety and for interventions to be successful, the social nature of the road user environment must be taken into account and the attitudes of road users examined. Research investigating the social nature of road user safety has previously focused on three key areas, attitudes towards road user safety, social norms and perceived behavioural control (for a review of literature see Musselwhite et al., 2010a).

In Western societies, research suggests that road users have a good understanding of the speed and collision link; where higher speeds increase the likelihood of a collision and the severity of casualty from the collision (e.g. Higginson, 2005; Quimby, 2005). A total of 87% of the British public state speed is a major cause in most road accidents (Fuller, Bates, et al., 2008). In addition, 90% of the British population agree it is important that people drive within the speed limits (DfT, 2008) and 39% state it is dangerous to drive over the speed limit at all (Angle, Buckley, Fearne and Goddard, 2007). However, Fuller, Bates et al. (2008), in the study of British drivers, suggest that 14% of drivers state they generally drive at faster speeds than other drivers, yet only 3% state they feel they are more dangerous, which is consistent with findings from other European countries (Cauzard, 2003; Quimby, 2005). The pattern is far more marked for younger male drivers who are more likely they are to believe that their speeding is not related to being more dangerous (Fuller, Bates et al., 2008). To conclude, when drivers are conceptualising the dangers of fast driving they are doing so by feeling that they themselves are not ordinarily speeding and on the occasions when they do speed they are still not any more dangerous than other drivers. European studies have revealed that the public know that human error is a major contributory factor in almost all road user collisions and accidents (for example, see Cauzard, 2003). However, road users often externalise the danger, citing that it is *other* drivers or *other* pedestrians not themselves that are the main risk on the roads (for example, King and Parker, 2008; RAC, 2007). Speeding is seen as a major problem in residential areas and there is strong public support for tougher enforcement of speeds. In the British Attitudes Survey, speeding drivers are continually viewed as serious by more people than viewed a problem with cars parking incorrectly or illegally, teenagers hanging around and issues with rubbish and vandalism (DfT, 2008). Hence, it is no surprise that in public opinion surveys across Europe, the majority of respondents support tougher enforcement of speed limits and in favour of reducing speed limits in certain residential areas, in particular by schools (Higginson, 2005).

An examination of British and European research suggests that almost all drivers believe other drivers frequently speed, for example break the speed-limit or go too fast for the conditions (Cauzard, 2003; Fuller, Bates, et al., 2008; Fuller, Hannigan, et al., 2008; Fylan et al., 2006; Silcock et al., 1999; Stradling and Campbell, 2003). The false consensus in the overestimation of the number of drivers speeding (Manstead et al., 1992)   has an influence on individuals own choice of speeding behaviour; the more likely drivers are to perceive others speeding the more likely they themselves are to speed (Fuller, Bates et al., 2008). Younger drivers are more likely than older drivers to perceive

other drivers as speeding (Yagil, 1998) and those who drive faster are more likely to perceive that other drivers speed (Aberg et al., 1997; Haglund and Aberg, 2005). Hence, there is a social norm associated with driving at over the speed-limit, one that the more dangerous individuals hold more strongly.

The presence or absence of other people influences road user behaviour. Thomas et al. (2007) reviews the evidence from around the World and concludes that it is the social relationship of the passengers to the driver that is important. For younger drivers, while some passengers, such as parents, tend to reduce risky driver behaviour, others , such peers, might encourage more of it. Young men were more likely to take risks than young women on the road, often stating that there is a social expectation that they would take such risks. Some young people felt they 'grew out' of risky driving as they got older with more expensive cars and family responsibilities. In addition, Forward (2009) and Silcock et al. (1999) suggest that the effect is there for all ages of driver but is more pronounced for younger male drivers who tend to drive faster when they were with friends but slower when there are children or their own parents in the car. These findings suggest that immediate peer pressure is an important factor in risk taking for some groups, young males in particular. They also suggest that there is an awareness of risk which does modify behaviour, for example to protect a child in the car.

Empathy for others also effects how road users might behave, for example, Musselwhite et al. (2012) found drivers who were also, or had previously been, motorcyclists showed more empathy for motorcyclists and understood their risk and hence displayed less risk around such users. In addition, Musselwhite et al. (2012) add that even those with family or close friends who are motorcyclists also display empathy and less risk around motorcyclists. Whether or not road users are perceived as legitimate effects risk taken; where the more road users are perceived as legitimately allowed to use the road, the more safe other road users treat them (see Chapman and Musselwhite, 2011, for example).

Previous research has tended to look at these aspects often in isolation – there has been research into passenger effects, research into attitudes towards speed and risk taking, research into deliberate risk taking and violations, but very little research has considered the links between these factors. Research has tended to be largely quantitative with little time for social discussion or deliberation on concepts that link to largely habitual behaviour. In addition, further exploration of how attitudes and behaviours formed and change over time and how they differ between and within contexts need further exploration (Musselwhite et al., 2010a). To explain the behaviour and draw together different social elements, this paper attempts to use two models: Azjen's *Thoery of Planned Behaviour* (Ajzen, 1985) and Bronfenbrenner's *Ecological Systems Theory* (Bronfenbrenner 1979, 1989, 2005). The models are chosen to contrast two different approaches that might be used to explain behaviour. The Theory of Planned Behaviour has a long tradition of being used in explaining individual factors that influence road user safety behaviour (e.g. Armitage and Conner, 2001; Conner et al., 2010; Elliott et al., 2003; Parker et al., 1992; Whissell and Bigelow, 2003). The model, by definition, only deals with planned behaviour and does not examine wider contextual influences (Avineri, 2012). Hence, a model that contrasts this approach is included in this paper in Bronfenbrenner's ecological systems theory (Bronfenbrenner, 1979,1989, 2005), a model which includes the wider social and contextual factors influencing behaviour.

The Theory of Planned Behaviour (TPB) model (Ajzen, 1985), (see figure 1) with its determinants of behaviour (attitudes, norms, Perceived Behavioural Control (PBC) and intentions) is a powerful model for explaining human behaviour. Thousands of studies have tested TPB in various behaviour domains. There is compelling evidence that TPB (applied in general non-transport contexts) accounts for about 40–50% of the variance in intentions and about 25–30% of the variance in behaviour (see, for example, Armitage and Conner, 2001). Norms play an important role in explaining intentions and behaviours in the context of road safety and, in relation to the model, subjective norms are known to predict intentions to speed (Conner et al., 2010). The relationship between subjective norms and behavioural intentions to commit driving violations was consistently stronger than between attitudes towards behaviour and behavioural intentions (Parker et al., 1992). However, in some of the empirical studies that tested the hypothesis about attitudes as a main determinant of behaviour, it was found that attitudes provide only a partial and limited explanation of intentions or behaviour. For example, Whissell and Bigelow (2003) found no link between attitudes toward speeding and actual reported collisions. By studying drivers' compliance with speed limits, Elliott et al. (2003) found very little relationship between attitude and intention. Studying the intention to commit driving violations, Parker et al. (1992) found that the relation between attitudes towards behaviour and behavioural intentions was consistently weaker than other determinants of behavioural intentions. Tolmie (2006), who studied pedestrian decision-making of young adolescents, found that attitudes have an influence on behaviour, but not as strong as other determinants of behaviour.

As argued by Avineri (2012), whilst the Theory of Planned Behaviour, which assumes behaviour is a product of intention, provides powerful explanation of behaviour in a wide range of contexts, it can be also argued that some behaviour occurs with little or no pre-planned intent; for example behaviour can be seen as impulsive, habitual or emotional rather than planned, and therefore a 'intention-behaviour gap' is observed. Generally, If road users are largely expected to act according to a 'plan', and specifically to exhibit consistency and transitivity in their choices, then their interactions with some of the attributes of the physical and social environment of road safety behaviour might not be taken into account in understanding their behaviour, as individuals are not expected to be much affected by what might be considered as irrelevant context. However, it might be argued that the roles that psychological and social factors of the different layers of ecological models have on risk behaviours of road users have not been fully investigated.

Insert figure 1 about here

Ecological models are increasingly being used to explain the interactional relationship between the external environment and an individual's behaviour. They propose there is a relationship between the psychobiological development of an individual and their immediate physical and social environment and that behaviour is as a direct result of the relationships between these. Bronfenbrenner's Ecological Systems Theory (Brofenbrenner, 1979, 1989, 2005) proposes a model (originally of human development) that has subsequently been applied to many different contexts of human behaviour, for example relationship between children's play and the wider environment (Holt et al., 2008), work-life balance in families (Kulik and Rayyan, 2006), and higher education (Poch, 2005). It suggests that there are different layers that effect a person's development or behaviour. The model (see figure 2) proposes five layers: the microsystem, the mesosystem, the exosystem, the macrosystem and the chronosystem. The *microsystem* is the layer closest to the individual, containing structures within which the individual immediately interacts with. Structures in the

microsystem layer include family and neighbourhood. At this level, structures and individuals have a bi-directional relationship. The *mesosystem* layer provides the connection between the different structures of the microsystem (Berk, 2000). The *exosystem* layer defines the larger social system within which the individual does not function directly. These structures impact on the microsystem but not directly on the individual. The outer-most layer, *macrosystem* is this outermost layer comprises of cultural values, customs, and laws (Berk, 2000). In addition to these four layers, the *chronosystem* encompasses the dimension of time, for example, the physiological changes that occur with ageing.

Insert figure 2 about here

The model has not previously been used to describe road user safety or transport and travel behaviour, though the model has addressed the development of risk-taking behaviour in general (see Boyer, 2006; Steinberg et al., 1994 for review and examples).

The following section illustrates research was carried out to map road users' views and perceptions can be mapped into the two models discussed above – The Theory of Planned Behaviour and Bronfenbrenner's Ecological Systems Theory.

Methodology

Research Design

The research described here was part of a wider project examining British road user's attitudes towards road user safety, to inform the post-2010 road user safety strategy (see Musselwhite et al., 2010b for more description of the overarching project). Taking a social approach to road user safety, qualitative methodology was selected. As outlined in the introduction, road user safety involves much contention and many interpretative views on what constitutes safety, which vary between and within individuals depending on the context within which they are discussing. To allow for different viewpoints to be developed and to allow contentions to be discussed focus groups were selected over interviews. In addition, in order to capture how people make informed and considered judgements and values, and to reveal dissonances and underlying motivations, a deliberative approach was taken, with individuals in focus group situations meeting over three waves of data collection. As a result, discussion on the social nature of road user safety took part within social context and an in-depth understanding of issues could be explored and discussed. A deliberative approach involves an examination of the role of people within policy making, specifically allowing individuals to consider different social practices that underpin policy making, considering their impact to themselves and wider society (see Burchardt, 2012; Murray, 2011), this was selected in order for the theory to be applicable, rather than a generic discussion per se. The deliberative public engagement technique was applied in the research design as it allows for reflection and elaboration on views and concepts on the patterns found in the largely quantitative research outlined in the previous section, especially where there is contention over thresholds (Burchardt, 2012). In addition, the focus group approach within the deliberative approach provides an opportunity to open up debates allowing participant's to understanding each other's competing views and concerns.

Participants

The research engaged 228 members of the public across the four locations in the UK (London, Bradford, Glasgow and North-West Wales).The areas were chosen to reflect a range of socio-economic contexts and a mix of urban (London, Glasgow and Bradford) and rural (North-West Wales) environments. Participants were purposively selected from the general public to take part in the study on the basis of a variety of key variables, including: gender, age and general transport use. Within each area up to 60 participants were recruited into one of six groups, with a maximum of ten participants in each group, selected in response to gaps identified in the literature review (see Musselwhite et al., 2010b for more details) and including different road user groups, life-stages and attitudes to risk (see table 1). Specifically, in each area, the groups were comprised as follows: Group 1: Young male drivers were selected as a group to represent the age and gender that have highest number of collisions as drivers and represent a group that has a high number of risk takers within it (Musselwhite, 2006; Parker et al., 1992); Group 2: Those who drive for work aged 21-54 were selected to represent those that feel they have little choice but to drive and those that are likely to have daily experience with the road ; Group 3: Those with children under the age of 16 (aged between 21 and 54), to assess a group who may show more empathy as road users for those more vulnerable, especially children (e.g. Thomas et al., 2007) ; Group 4: Older people (both drivers and non-drivers aged 55+) as they pose a group more likely than other ages to suffer mobility issues in later life (see Musselwhite, 2011 for review); Group 5: Younger working people with no children yet (aged 21-34) to examine a group who have more recently moved from being within a group determined as high risk taking (i.e. 17-21 years); Group 6; Individuals with placed into four different groups, one in each area, based on categorising their attitudes to risk taking behaviour on the road, which allowed a concentration of viewpoints and contrasting analysis to take place. The four categories of road users identified in the Driver Risk Survey by Musselwhite (2006) were used: People who predominantly take risks on the road (risk takers; Bradford); those who do not usually take risks on the road (non-risk takers; North-West Wales); People who take risks when under stress (lost or late for work or an appointment etc.) (reactive risk takers; London) and; People who take risks when they think it is safe to do so (driving fast late at night on empty roads, for example) (calculated risk takers; Glasgow).

Insert table 1 about here

Procedure and tools

Participants were engaged in three reconvened workshops across the four areas. Workshops were held approximately three weeks apart. The first two workshops were held during the evening and lasted for two and a half hours. The final workshop was held over the course of a Saturday, lasting seven hours. The group discussions were largely shaped by a prior in-depth literature review (Musselwhite et al., 2010a). The first workshop explored the relationship between identity and driver behaviour, within the context of wider risk taking. Specifically, it examined how these factors mediated attitudes to road safety – for instance views on whether and under what circumstances it is acceptable to break rules on the road. In this regard, the role of norms influencing road safety behaviour was also explored – both in terms of promoting good and poor driving. Between workshops 1 and 2 participants were asked to undertake a 'homework' style task to map local roads that they perceived to have significant road safety issues. This mapping exercise was used to inform the debate in the second workshop. The second workshop built on the previous discussion by exploring the relationship between place, identity and road safety. Specifically, it explored how

location and driver familiarity influenced perceived risks, attitudes and ultimately behaviours on roads. The role of wider norms in influencing behaviours was also highlighted. Participants considered issues on the road from different road user perspectives - this different hats session looked at the differences in perceived risks on the road between car drivers, motorcyclists, cyclists and pedestrians. Finally, responsibilities for safety on the road were also explored. The final workshop sought to test various specific policy options and began with a discussion on potential interventions and debated the effectiveness and fairness of each in depth.

Analysis

The workshop sessions were recorded using digital recording equipment. Electronic recordings were transcribed verbatim. A thematic analysis was conducted on the data, using a technique known as matrix mapping. A thematic matrix is constructed with headings of topics associated with the key elements covered in each workshop. The transcript material was then summarised into this framework. The researchers reviewed the material and identified features within the data, further defining concepts, looking for associations and explanations under each topic heading. This framework identifies themes that emerge from the interviews as well as looking at similarities and differences between different groups. Key issues and underpinning features were then used to construct the reports and verbatim quotes to illustrate the findings. The concepts from both Bronfenbrenner's ecological theory (Bronfenbrenner 1979, 1989, 2005) and Azjen's Thoery of Planned Behaviour (Ajzen, 1985) were then used to sort the data from the topic headings, so that topics were placed under appropriate concepts from each framework where applicable.

Findings are discussed in relation to the strength of opinion, rather than numerically noted in terms of time or number of participants mentioning a topic. This is appropriate since a deliberative approach using focus groups does not include generalisable sample of participants, nor standardised data collection methods (for discussion see Vicsek, 2010).

Findings

The findings are discussed in terms of risks individuals performed on the road and the motivations for these risks. Particular emphasis is given to the social influences in the road environment that influence risk and a series of models are given that explain how risk was conceptualised by the individuals in the study. The findings are reported as mapped to the Theory of Planned Behaviour and then Bronfenbrenner's Ecological Systems Theory.

Mapping findings to the Theory of Planned Behaviour

Mapping the findings to Ajzen's Theory of Planned Behaviour (Ajzen, 1985) reveals interesting statements about risk and road user behaviour in terms of attitude, norms and perceived behaviour control.

Attitudes towards risk taking behaviour

Three distinct attitudes towards a behaviour were identified as sub-categories, the difference between views of speeding when talking as a resident compared to talking as a driver, the reinforcement of not crashing for performing risky behaviour and ownership of risk.

Speeding is negative when a resident and positive yet safe when a driver. People's attitudes towards driving with high risk are not always consistent. Participants generally felt speeding was wrong, this was especially true when discussing road safety issues in their own neighbourhood and locality. However, this attitude shifted when discussing their own driver behaviour, when speeding was felt to be justified in many situations. It was common for respondents to state they drove at a speed of their own choice (often over the speed-limit) that they still felt was safe with reasons for this including: feeling speed limits were too stringent or were out of date with modern technology of cars and their ability to brake more quickly; speeding when roads were empty; and speeding on motorways, which was often perceived to be of very little risk.

Feedback from mistakes. Participants discussed that generally road users do not learn from their mistakes, especially where there is no negative feedback,

"The more you don't have an accident, the more you're invincible I think you feel as well" (Male, Wales, Children in Household)

Ownership of risk and consequence. Typically, participants did not view the wider implications of their actions on other road users, feeling they themselves are the most likely to have negative outcomes. When other individuals were affected - particularly innocent parties - this was felt to make the risk unacceptable: with participants giving the example of passive smoking in this regard. However, dangers resulting from risky road user behaviour, including speeding and driving too close to the vehicle in front, did not inherently get put into this category, with the exceptions being drink-driving and drug-driving. Hence, the risk displayed through driving is not inherently viewed as affecting innocent parties and does not affect people's social responsibility framework in the same way smoking does,

"Some people have the opinion of, you know, it's their own safety that's at risk" (Young Male, Wales)

Subjective norms

Much of the discussion contained issues that relate to the subjective norm showing the social nature of road user safety and that behaviour was often performed in light of what others did. Participants discussed how other's influenced their own risk, less directly – as it was part of normal behaviour on the road – and more directly, for example peer group pressure.

Taking risks as others do. Norms of behaviour within certain contexts was said to fuel risk taking behaviour. A common discussion point in this respect was keeping up with the traffic flow.

Participants strongly noted the influence of others in pressurising themselves to take risks, particularly cars driving close behind:

"You know, I find those sorts of situations, you know, when you're being pressured from behind to make an erratic move which could end up causing something else, you know" (Male, Wales, Drive to Work)

Peer group pressure and encouragement to take risks. It was strongly felt that the concept of peer pressure was thought to be something that younger road users, especially male drivers, faced. Participants generally recognised the "peer pressure" element when they were younger, especially the males in the groups, describing the need to impress friends with a more aggressive, fast, risk-taking driving style. Younger participants strongly stated it was not always direct peer pressure that influenced risks, with wider social norms and expectations of driving in different contexts with different passengers encouraging them to drive in different ways,

"It depends on what type of passenger it is, right, if it's your mum, I'm driving like a granddad, when it's my mum or if it's a child in the back or whatever, you drive safely, no matter what. Whereas, if it's your friend, I'm trying to say, you might try and show off, you might just drive how you normally drive which is you might be crazy, you might be cool, but it depends on the passenger, that's what I think". (London, Young Males)

"Friends, your peer groups sometimes would push you... you could even do it unconsciously, like nobody is saying anything to you but you just want to impress them! (Male, Glasgow, Risk takers)

Groups discussed how the situation is magnified if a passenger is drunk and the atmosphere inside the vehicle can become rowdy and distract the driver,

"If you've got, like, two friends in the back or something, yeah, you're turning over talking to them, your friend touching your music, turning it up louder and changing the track and stuff and it annoys you or whatever ... I realise that every time I stop, I just turn around and talk, even when I'm driving, I look at the road ahead and there's nothing there, I'll just quickly turn around and say, blah blah and then turn, do you know what I'm saying?" (London, Young males)

In addition, young males discussed how peer pressure to perform risky behaviours is actually worse when in separate cars as there is a direct comparison between peers as to who can take the most risk.

Perceived Behaviour Control

Perceived behavioural control was revealed by two different categories. First, risky road user behaviour was likely to be performed where participants felt they had the ability to perform the behaviour and had some control over the outcome. In addition, a lack of ability to tell others to curb their risky behaviour was commonplace.

Control over risk and outcome. It was frequently stated that the risky behaviour was only displayed when the individual believed they could manage the risk - for example if the road was empty, it was early in the morning or on roads that it was felt were designed for speed, in particular motorways. Such behaviour was argued as a calculated decision,

"I suppose in excess of the speed limit but take into consideration the amount of traffic on the road as well. I break the speed limit. I'll do, certainly on the motorway, but I think I would be less likely to do that if it was rush hour" (Male, Wales, Children in Household)

Telling others to drive safely. It was noted that participants found it difficult to tell someone else to drive safely. While dependent upon the relationship, on the whole it was extremely difficult for friends to tell one another directly that they believed their driving was poor or dangerous. It was also noted that it was difficult to tell people who are higher up in authority or status at work when driving for business, and people thought the power difference could result in it being difficult to know what to say in risky situations,

"You can't tell your boss to slow down, can you! Even if he's like speeding or something, you got to go with it, you're in his car. Don't think I'd know what to say" (Female, Wales, Drive for Work)

Mapping findings to the Ecological Systems Theory

Bronfenbrenners' Ecological Systems Theory model (Bronfenbrenner 1979, 1989, 2005) allows a pathway to be followed to help understand variation in risky driving/road user behaviour.

Microsystem layer

At the *microsystem* level, discussion of road safety risk is linked to the immediate environment (infrastructure and vehicle) and to people linked with the vehicle, such as passengers. This is the layer most clearly articulated by individuals and clearly involves individual attitudes and social norms. Much of the immediate environment is cited by participants as to why driving over the speed-limit is OK. The vehicle's perceived capabilities, such as specific features like Anti-lock Braking Systems (ABS) or more generic attributes such as the sporty nature of the car, were cited as a reason for speeding. In addition, it was common for people to take a judgement of risk based on the road environment, such as speeding when roads were empty or on certain types of road like motorways or dual carriageways when they have little traffic on them,

"Do you think 90 miles per hour is dangerous if there's no vehicles on the road? No, I don't. I really don't" (Male, Bradford, Drive to Work)

"I break the speed limit. I will do, certainly on the motorway" (Male, Wales, Drive to Work)

An important stimulus for speeding and increased risk taking was the frustration caused by congestion,

"Congestion is a major reason why they speed. You're caught in congestion, you get a clear road and you speed to try and make up time." (Male, London, Drive to Work)

The majority of respondents admitted their driving style and the amount of risk accepted depended upon type of passenger in the vehicle. It is clear that respondents felt that people are judged based on their driving and will change and adapt their style accordingly to promote a favourable impression of themselves to passengers– a process known as 'impression management'. Social norms and

expectations influence how people might believe they should act in certain situations, regardless of more direct peer pressure:

"Well when you first get a boyfriend you're like trying to drive dead like quite sensibly, and then as you get to know each other you like show off a bit.....Like drive like a boy as well.....Yes, with my best friend I just drive like I normally would and I'd sort of know where to drive fast and where to drive slow and things. Friends I'm not so close with I just drive like, I don't know, a bit more carefully really, because I don't know them that well, sort of like judge me for my driving. Because people do judge you from your driving, because it's like responsibility isn't it?" (Female, Wales, Drive to work)

However, peer pressure, the more direct influence to behave in certain ways, may be related to wider social norms as acknowledged at the macrosystem level; what family and friends expect of each other with regard to driving seems to be influenced by more general social norms, for example peer pressure to drive with a more aggressive, fast, risk-taking driving style for younger drivers.

Finally, while there were examples of children causing driver stress and distraction, on the whole parents were able to habituate against 'squabbles on the back seat' and continue to drive safely. It was also noted in two of the groups how children can influence their parents' behaviour, for example, children saying slow-down or be careful means the parent drives more cautiously.

Mesosystem layer

The interaction of two or more microsystem layers is often articulated by participants. Combinations of factors being present together led to the risky behaviour being displayed and the absence of one or more factors reduces the likelihood of an individual displaying risk. Examples often included the infrastructure, showing the importance of design of the road environment. Participants admitted to taking extra risks when late for work or for an appointment, but only when the road environment would allow, such as in empty traffic or away from residential areas. Participants also noted the type of vehicle combined with road type could influence risks taken,

"You might just push it a bit more on the motorway yes. The car's designed for speed so that's when you know it can handle that type of risk." (Male, Wales, Drive to Work)

Exosystem layer

The *exosystem* layer shows the wider importance of structures associated with the outcome of driving. Not least the importance of reducing travel time and arriving at destinations for appointments on time, most notable work and school (for those with children). The importance of being on time for appointments and the stresses of modern day life were cited as reasons for taking risks on the road. There was more to be lost from missing appointments and wasting time travelling than there was from being a safe road user,

"I couldn't be bothered at all about crashing. So I cut into the tightest spaces, far too tight spaces, just get in it...There's the pressure of getting to jobs, getting jobs done, making your time, making money" (Male, Glasgow, children in household)

The direct effect of concerns about being late cause anxiety which in turn affects many people's driving behaviour. Participants articulated that wider concerns linked to the consequences of being late might influence them to drive faster and with increased risk:

"To be honest if I was thinking that I was going to be late, I would generally drive a wee bit quicker, which would be creating the risks, you know, but I wouldn't do anything out of control." (Female, Glasgow, Drive to Work)

"'I'm an amber gambler, if I'm in a rush, mostly if I'm in a rush. I won't do it, if I'm not in a rush, I'll just sit at the lights'" (Female, London, Children in household)

Driving while tired was not uncommon and a few individuals noted that they drove when they were dangerously tired, almost exclusively linked to work. One individual stated he had crashed three times after falling asleep at the wheel. In all cases being tired was legitimised through extenuating circumstances, including unusual long hours of work or having to drive a long distance for work purposes.

There was widespread admission to driving after drinking alcohol and there was surprisingly high admission from many drivers who admitted they had driven while they thought they were probably over the legal limit. The admission was most common from those in the rural and London groups. Reasons for having drunk too much alcohol but continuing to drive often centred on an unusual wider social context not directly linked to driving, hence the link to the exosystem layer, for example being at a wedding or funeral and it was usually noted that it was not the original intention of the driver to drink-drive.

Macrosystem layer

At the outer most layer, the *macrosystem* layer, cultural norms, rules and laws, along with interpretation of these for individuals has an effect on the amount of risk accepted,

'Well the speed limits are 30 aren't they, but no one does it just there no one so no I don't either, no one can stick to it' (Male, Glasgow, children in household).

The symbolic role that cars played in the lives of young men in particular was also a strong theme. This was not only in terms of the freedom and the status it conferred, but also in terms of thrill seeking and driving fast for the 'adrenaline rush'. Certain young male participants highlighted they felt they were 'programmed' to drive at high speeds and were generally fearless of consequences. The glamour of driving fast, captured in films and television programmes was also generally highlighted across groups. It was noted by some respondents there was a need to behave in a manner as would be expected of them. The idea of 'playing up to stereotypes' was also used to legitimise risk,

"I've got a white van, so it's like that's the rule, isn't it?" (Male, Bradford, Working, no children in household)

The concept of peer pressure, played through these social norms, was a strong theme brought out in relation to mainly younger male road users. In general, people recognised the "peer pressure" element when they were younger, especially the males in the groups, describing the need to impress

friends. Younger people also admitted to this being deliberate by stating that they change their driving behaviour depending who is in the car.

Chronosystem layer

At the *chronosystem* layer, it is clear that acceptance of risk varies over the lifetime of an individual. The majority of respondents felt their own driving had become safer with increasing maturity, largely because of increased driving experience, including: having, seeing or knowing people in accidents and learning from these; a reduction in negative peer pressure; having responsibilities such as children and a job that requires driving; a growing sense of mortality; increased tolerance for others' behaviour; and a realisation that driving faster does not actually match a reduction in time taken to travel. As people move through different life stages, especially when becoming a parent, there are pressures to conform to safer driving behaviours. Older people stated they often felt they were being judged by others and so had to drive extra especially safely, although the pressure on the driving resulted in them often driving with increased risk. Younger drivers themselves also noted a change in their behaviour – stating that their driving behaviour generally became less risky as they got older. This was both as they mature, but also as the novelty and excitement wear off.

'I think I am better. I have calmed down a lot. I'm more aware. I used to have a moped when I was sixteen. I was hyperactive when I first started. I was here, there and everywhere, driving all day long every day. It is a new thing. But once you get used to it, it is nothing. You always feel it when you first pass, forty seems fast on a moped when you go round corners, but after you have been on the motorway and country roads, it is boring.' (London, young male)

People's identity with the mode of transport they use changes over time. People who had in their past used different mode of transport carried with them some of the understanding or empathy of that mode of transport, regardless of how much they used that mode now. Hence, people who had once ridden motorcycles, understood motorcyclist risk,

"Well. I can understand their behaviour. I used to ride myself, so it's not surprising to see bikes weaving in or out of traffic and speeding past you" (male, Wales, group 4, older people group)

Discussion

Both Brofenbrenner's Ecological model (Brofenbrenner, 1979, 1989, 2005) and The Theory of Planned Behaviour (Ajzen, 1985) help to frame conceptualisations of risk taken on the road by participants. Both models have their merits, Brofenbrenner's helps to show multidirectional relationships between the variables, highlighting for example interactions between risk displayed and a variety of contextual factors. Because of the chronological layer the model appears more fluid than The Theory of Planned Behaviour. However, the Theory of Planned Behaviour in particular highlights how important the concept of perceived behavioural control is to individuals, the need to be able to have the skills and ability to perform the desired behaviour. In order to reduce the amount of risky behaviour displayed road users need to be able to feel they can make the change and this highlights that individuals can feel unable to do this in light of other contextual factors and how the ability to take risks on the road are often seen as easier to make. Both models highlight the strong importance of social norms and in particular peer pressure and how that affects road user behaviour, both with a

positive and negative effect on behaviour. Hence, in order to improve risk taking behaviour on the roads, social norms are a key element to concentrate on. Brofenbrenner's model shows how social norms relate across different layers and structures from the macrosystem layer to the microsystem layer, they play out amongst family and friends at the microsystem layer but are largely structured by wider social and cultural norms.

Brofenbrenner's model highlights the importance of immediate contextual behaviour in terms of both the external and internal environments, showing how different times of the day and different types of road affect risk taking and how stressors such as being late or stressed can affect risks taken. These elements are less revealed by The Theory of Planned Behaviour, which emphasises attitudes over context, and does not always reveal how microsystem changes in context affect attitudes. This perhaps suggests that combining both models might provide a useful integrated framework of behaviour, especially in risk taking in driving context.

It is noted, however, that neither of the models particularly deals very well with irrational elements of behaviour, especially those associated with doing something for its own intrinsic value. Certain respondents noted how risky behaviour was sometime cathartic, helping them to get rid of frustrations. Driving in a risky manner was also said to be an ego-boost making people feel better about themselves, particularly from those in younger age groups. In addition, the risk-taking group discussed how driving fast is fun, and one younger male group in Glasgow also described crossing the road and dodging the traffic as fun. The models also do not cover how risky behaviour can result from being distracted, for example use of mobile phones or merely daydreaming.

There was widespread admittance of risk taking on the road, especially 'speeding' as a driver, amongst the participants, although, in line with previous research (see Musselwhite et al., 2010a for review), definitions of 'speeding' varied from 'going over the speed limit' to 'excessive speed for the conditions' (which could be as much as 10 mph or more over the speed limit before speeding was defined). Previous research shows speeding behaviour is highly prevalent (e.g. Silcock et al., 1999; Stradling and Campbell, 2003). The Theory of Planned Behaviour illustrates where it is common for participants to state that they drove at a speed of their own choice, because they felt it was safe to do so, they were able to do so with no negative feedback and they did not view the personal consequences negatively. Hence interventions would stem around increasing reflection on potential consequences, reducing over confidence and providing negative feedback for risky driving. Bronfenbrenner's model, by contrast, highlighted many contextual reasons for this including feeling speed limits were too stringent or were out of date with modern technology of cars and their ability to brake more quickly; speeding when roads were empty; and speeding on motorways, which was often perceived to be of very little risk. The speed limit being too stringent or low as a reason for speeding has been found in previous research (see Fuller, Bates, et al., 2008). The notion that speeding is acceptable when individuals have calculated it as being so, such as when roads are empty, concurs with a 'calculated risk taker' (Fuller, Hanigan, et al., 2008; Musselwhite, 2006). Emotive issues, such as being late, lost or stressed, were seen to impact negatively on individuals' driving behaviour, as identified in line with the pressures of work in Bronfenbrenner's model. This was a category of driver, a reactive risk taker, identified by Musselwhite (2006), and was further explored by Fuller, Bates et al. (2008). Further investigation is needed into how either of these might be mitigated. For example, the growing use of satellite navigation systems may reduce the stress of getting lost, and the use of mobile phones (hands-free) means individuals can phone ahead to reduce

the stress of being late. Calculated risk taking is linked to a level of individual rational logic, and further investigation is needed into how such logic is formed amongst individuals.

Previous research suggests that risky behaviour, along with their attitudes change over time as highlighted in the chronological layer of Bronfenbrenner's model. Similar to previous research, on the whole, older drivers have less risky attitudes to road user safety (Angle et al., 2007) and are more supportive of interventions aimed at improving road user safety (Stradling and Campbell, 2003). This translates into behaviour with older drivers (age 50 years and over) displaying fewer violations with regard to driver behaviour, especially aggressive violations, suggesting that deliberate risky behaviour is far less prevalent amongst this age group (Parker et al., 2000). This research found similar results, the majority of respondents felt their own driving had become safer with increasing maturity, largely because of increased driving experience, responsibility, a reduction in negative influence from others and a realisation that driving faster does not actually match a reduction in time taken to travel. Hence, it seems that differences in road user safety attitude and behaviour between younger and older drivers are linked to changes within people over time, not to a cohort difference, although further longitudinal research would be required to confirm this. In addition, the chronosystem layer also shows how although the focus of road user identity might change with modal use, having previously used a particular mode of transport can carry through and effect perceptions of road user safety with that mode, regardless of current use. So, previous use of a mode can create an empathy with that mode that prevails even when use of that mode ceases, similar to previous papers (e.g. Musselwhite et al., 2012).

A point which is captured well in the microsystem layer of Bronfenbrenner's model is that it was common for the participants to take risks based on the immediate road layout, highlighting the importance of changing the road environment in order to reduce risk. An emerging theory examining the relationship between familiarity, certainty and road safety suggests that an increase in familiarity and certainty only benefits drivers at the expense of other road users. Hamilton-Baillie (2008) suggests that streets have been planned and developed in such a way that levels of uncertainty and intrigue for drivers have been reduced. This has been done to increase road user safety through enhancing predictability of the road environment, which largely benefits motorists. Hence, the predictable nature of a street, with its minimum stopping distances, standardised road signs and markings, means that vehicles are able to drive at a faster speed, a feature that was echoed in the research here. Hence, the concept of disrupting this standardisation through concepts such as shared space could have positive effects on road user safety, tentative conclusions from the UK suggest this could be the case (Hamilton-Baillie, 2008, Hammond and Musselwhite, 2013; MVA Consultancy, 2010; Kent County Council, 2010; Swinburne, 2006).

Both models helped highlight a key theme where participants admitted their driving style and the amount of risk accepted depended upon the type of passenger in the vehicle. Current research suggests, younger people in particular are susceptible to especially negative influence on their risk taking behaviour on the road from peers (Silcock et al., 1999; Thomas et al., 2007). However, this research builds on previous research by showing that peer pressure is prevalent in two additional settings. First, it is in place when the environment in the car is akin to a party atmosphere, with drunken passengers who not only distract the driver but create a party atmosphere, which negatively influences driver behaviour. Second, this research suggests that individuals who have a strong desire to impression-manage continue to feel peer pressure even when it is not physically present in terms

of a passenger actually being there. This research also suggests that driver behaviour is also modified for older drivers depending upon the passengers present. Individuals continue to drive more recklessly alone, which concurs with previous research (Fuller, Bates et al., 2008; Fuller, Hannigan et al., 2008). This has implications for the way people view road user safety – they feel a sense of direct responsibility to passengers, but not for themselves. However, the consideration of potential collision with other people, or the consequence of their accident on their family and friends, is not typically considered. Effects of peers on driver behaviour is so strong perhaps would be erroneous to try and disrupt that relationship and instead to introduce interventions that work with the peer context within which driver behaviour is enveloped.

It is suggested that both models have merit and can be used in conjunction to help frame perceptions and understanding of road user risk. The Theory of Planned Behaviour emphasises the importance of the individual and how they conceptualise risk taking, including how others influence behaviour and how they feel they are able to perform behaviours. Bronfenbrenner's model offers suggestions as to where such conceptualisations might originate in wider social contexts. However, without understanding individual conceptualisation, identifying interventions may be difficult to place, how do you change culture, for example, especially if chronological changes may mean a future system could be quite different. Yet, over emphasising the individual role in road user safety refuses to acknowledge wider barriers to enabling successful interventions. For practitioners, adopting one model over another would result in very different interventions being developed to improve road user safety. The Theory of Planned Behaviour suggests that participants own much more of their behaviour and that solutions should be at the individual level, allowing people to gain control over their behaviour, suggesting more engineering and enforcement style interventions disabling the dangerous behaviour. Education would involve improving skill alongside altering attitudes, values and beliefs. The ecological approach by its very nature, would suggest holistic solutions drawing on wider proximal events such as organisational behaviour combined with types of road environment, which when combined can create the ingredients for speeding in the context of being late for work, for example. Traditionally, practitioners have dealt mainly in the former, but the research suggests the latter helps explain many combinations of factors less likely to be picked up in the Theory of Planned Behaviour alone and hence may incorrectly select the right intervention.

Using deliberative research methods allows individuals time to reflect on their driving behaviour. There is a growing body of research suggesting that the most positive effect on attitudes and behaviour seems to come from group discussions on driver behaviour that emphasise interaction between road users, reflection on habitual and subconscious behaviour, which reduces habitual behaviour by raising into the conscious habitual behaviours (Dorn and Brown, 2003; Fylan et al., 2006; McKenna and Poulter, 2008). In addition, such group discussion should highlight internal inconsistencies (including cognitive dissonance), emphasise social norms, introduce emotive content and a reflection on attitudes, values and beliefs. Hence, it would be expected that individuals taking part in deliberative research should become more self-aware of their own driving behaviour. In particular people can become aware of how much control they have, what they can and cannot do safely behind the wheel through discussions on perceived behavioural control and how different aspects of the microsystem layer- and mesosystem layer context influences their behaviour, raising it from the subconscious to the conscious. Further research could examine how reflections on practice in such domains affect behaviour and could form the basis of training or re-training programmes.

Perhaps a future research direction might be, following further investigation and validation of risk conceptualization by the two models, incorporating insights from the two models in the design and implementation of a range of 'soft' behavioural change interventions such as education, training, information provision, and mass-media persuasion; for example insights on the role of elements at each layer of an ecological model of risk taking behaviour might help in shaping the 'social' elements (highlighting the interactional relationship between the external environment of each layer and an individual's behaviour) in the design of an effective campaign.

Acknowledgment

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Group	Study location				Gender		Respondents' age group					Total
	London	Bradford	N. Wales	Glasgow	Male	female	17-20	21-34	35-54	55+	With children (1)	Total
1	7	9	8	10	34	0	34	0	0	0	0	**34**
2	11	9	10	10	19	21	0	17	15	8	23	**40**
3	8	9	11	10	18	20	0	16	22	0	38	**38**
4	10	10	9	10	19	20	0	0	2	37	0	**39**
5	9	11	9	10	20	19	0	38	1	0	0	**39**
6 Reactive risk takers.	8	0	0	0	4	4	0	3	4	1	3	**8**
6 Risk takers.	0	10	0	0	5	5	1	1	4	4	2	**10**
6 Non risk takers.	0	0	10	0	3	7	3	2	2	3	3	**10**
6 Calculated risk takers.	0	0	0	10	4	6	0	2	4	4	3	**10**
Total (% of total)	**53 (23.3%)**	**58 (25.4%)**	**57 (25%)**	**60 (23.32%)**	**126 (55.3%)**	**102 (44.7%)**	**38 (16.7%)**	**79 (34.6%)**	**54 (23.7%)**	**57 (25%)**	**72 (31.6%)**	**228**

Table 1: Participants background details within each focus group