

Traffic behaviour and compliance with the law in low and middle income countries: are we observing “pragmatic driving”?

Mark King^a

^a Centre for Accident Research and Road Safety – Queensland (CARRS-Q), Queensland University of Technology

Abstract

A common theme in many accounts of road safety and road use in low and middle income countries is a widespread lack of compliance with traffic laws and related legislation. A key element of the success of road crash prevention strategies in high income countries has been the achievement of safer road user behaviour through compliance with traffic laws. Deterrence-based approaches such as speed cameras and random breath testing, which rely on drivers making an assessment that they are likely to be caught if they offend, have been very effective in this regard. However, the long term success of (for example) drink driving legislation has been supported by drivers adopting a moral approach to compliance rather than relying solely on the intensity of police operations. For low and middle income countries such morally based compliance is important, since levels of police resourcing are typically much lower than in Western countries. In the absence of morally based compliance, it is arguable that the patterns of behaviours observed in low and middle income countries can be described as "pragmatic driving": compliance only when there is a high chance of being detected and fined, or where a crash might occur. The potential characteristics of pragmatic driving in the macro-, meso- and micro-context of driving and the enforcement approach that could address it are outlined, with reference to the limited existing information available.

Introduction

The statistics on global road fatalities are now well known and frequently cited – more than 1.2 million people are killed as a result of road traffic injuries each year and tens of millions experience non-fatal injuries that disable them temporarily or permanently (WHO, 2013a). Although high income countries (HICs) including Australia account for almost half of the world’s registered motor vehicles, about 90% of road fatalities occur in Low and Middle Income Countries (LMICs) (Wesson et al, 2014). In East Asia and the Pacific, road traffic injury ranked third in causes of loss of disability adjusted life years in 2010, compared with 10th globally, and total road fatalities in the region have increased by 50% since 1990 (IHME and HDN, 2013). These crashes have a high economic cost (Wesson et al, 2014) and a significant impact on development (Bliss and Breen, 2012), which reduces the effectiveness of international aid across all of the Millennium Development Goals (Ericson and Kim, 2011).

Road infrastructure in LMICs has been improving, and Australian aid has continued to make a significant contribution to this. However, behaviour of road users in LMICs remains a major problem, a common observation being that it is chaotic, or lawless (Chalya et al, 2012; Gostin and Friedman, 2013; Jain et al, 2012; Kolnberger, 2012). This is to some extent an exaggeration, because drivers and motorcyclists try to avoid colliding with each other or with pedestrians, i.e. it is not a “demolition derby”. However it is true that illegal and unsafe road user behaviours are widespread, e.g. not wearing a motorcycle helmet, failing to comply with traffic signals/signs, and speeding. This is a problem of compliance with safety-related rules. Research in LMICs indicates that in most cases, non-compliant drivers and riders know what they should do, but do not do it (Isoba, 2002). As a consequence there is an emphasis on a multifaceted approach that involves: “adopt(ion) and implement(ation of) national road safety legislation and regulations on the major risk factors, and improve implementation through social marketing campaigns and consistent and

sustained enforcement activities” (UN General Assembly Resolution 66/260(6), cited by WHO, 2013b). Given that legislation and social marketing by themselves have limited impact, police enforcement plays a crucial role in achieving compliance with road safety legislation (Bates et al, 2012).

There is a considerable body of literature on the relationship between police enforcement and compliance with the law, including a substantial literature devoted to enforcement of traffic law (Davey and Freeman, 2011). The primary concept is that of deterrence of offending, often broken down into specific deterrence (the person caught and punished is deterred from reoffending) and general deterrence (people in general are deterred from offending, without having been caught) (Davey and Freeman, 2011). In classical deterrence theory the main factors that contribute to higher deterrence are a high perceived risk of being detected, a high perceived severity of the punishment, a high perceived certainty that the punishment will be administered if caught, and a perception that the punishment will be administered swiftly (Fleiter et al, 2013). In recent research (Scott-Parker et al, 2013) the role of punishment avoidance has been investigated – committing an offence and not being detected – and further theoretical elaboration of deterrence and punishment in relation to road use behaviour has been undertaken (Fleiter et al, 2013).

Compliance through deterrence is supplemented (and ideally replaced in the long run) by voluntary compliance based on *moral adherence to the law*, either because the law is considered to be morally justified, or because it is considered morally right to comply with authority even if the law is contestable (Davey and Freeman, 2011). This paper proposes that a driver strategy that explains a lack of voluntary compliance is *pragmatic driving* where compliance only occurs in response to the deterrence variables and anticipated collision risk, and where no moral component exists. It is further argued that pragmatic driving is common in LMICs and presents significant challenges to the use of enforcement as a means of achieving voluntary compliance, and some suggestions are made for addressing these challenges.

What is “pragmatic driving”?

Dictionary definitions of “pragmatic” and “pragmatism” refer to an emphasis on the practical consequences of actions. Here, the following is proposed:

Pragmatic driving describes driving behaviours that achieve personal mobility aims while optimising perceived safety and enforcement risks, regardless of the legality of the behaviours involved.

Essentially, drivers are aiming to reach a destination with a minimum of delay, taking into account the possibility of a collision and likelihood of being detected committing an offence. The legality of their behaviour is only relevant if enforcement is a possibility.

Figure 1 presents a more comprehensive approach that describes the factors that influence compliant or pragmatic driving, and makes an important distinction between macro-, meso- and micro-contexts.

Macro-context: comprises enduring factors that influence a driver’s behaviour across trips. Some drivers tend to comply with the law, either because they see it as morally justified, or because they believe it is important to comply with laws even if they do not necessarily agree with them. Tapp et al (2015) identify these two groups in their survey of British drivers’ support for and compliance with low residential speed limits. Some drivers will generally disregard the law and therefore display pragmatic driving across most circumstances. Personality traits and dispositions (e.g. intention to comply or offend, optimism bias) operate at this level also.

Meso-context: comprises factors that influence driver behaviour during a particular trip, and therefore moderate the influence of macro-context factors. An important influence is the degree of time pressure, while fatigue and impairment by alcohol or drugs will also affect behaviour during the trip. The influence of passengers during a trip is well documented (e.g. Scott-Parker et al, 2009) and has been categorised here as impression management, which also includes managing impressions presented to the public while driving an identifiable company car; this would also apply to fleet vehicles where driver behaviour is recorded and/or monitored. The general behaviour of other drivers during the trip would also have a social contagion effect (Tapp et al, 2015). These trip-based factors could influence pragmatic driving among drivers who are otherwise compliant, e.g. time pressure leads to speeding, while keeping watch for police enforcement.

Micro-context: comprises factors in the immediate traffic situation. An important factor is the expected behaviour of other drivers, i.e. whether it is anticipated that they will comply with the laws or not, whether they will act selfishly or employ courtesy, etc (Lennon and King, 2015). This sets up something analogous to a “prisoner’s dilemma” scenario which lends itself to utility-based decision-making. Drivers who comply with the law might be disadvantaged by time delay in both absolute terms (actual delay) and relative to other drivers who do not comply. However, by failing to comply there is a crash risk and a possibility that the offence will be detected and punished.

It is hypothesised that pragmatic driving would be most commonly observed in the micro-context, since there will be situational factors that will influence drivers who would normally comply in general (macro-context) and have been compliant during the trip (meso-context) to take a more pragmatic approach in a specific traffic situation if compliance is too costly. For example, if a traffic light will not respond to vehicle presence, even drivers who are highly compliant are likely (once they have waited long enough) to go through the red when they judge it safe enough to do so.

Figure 1. Macro-, meso- and micro-context factors influencing compliant vs. pragmatic driving

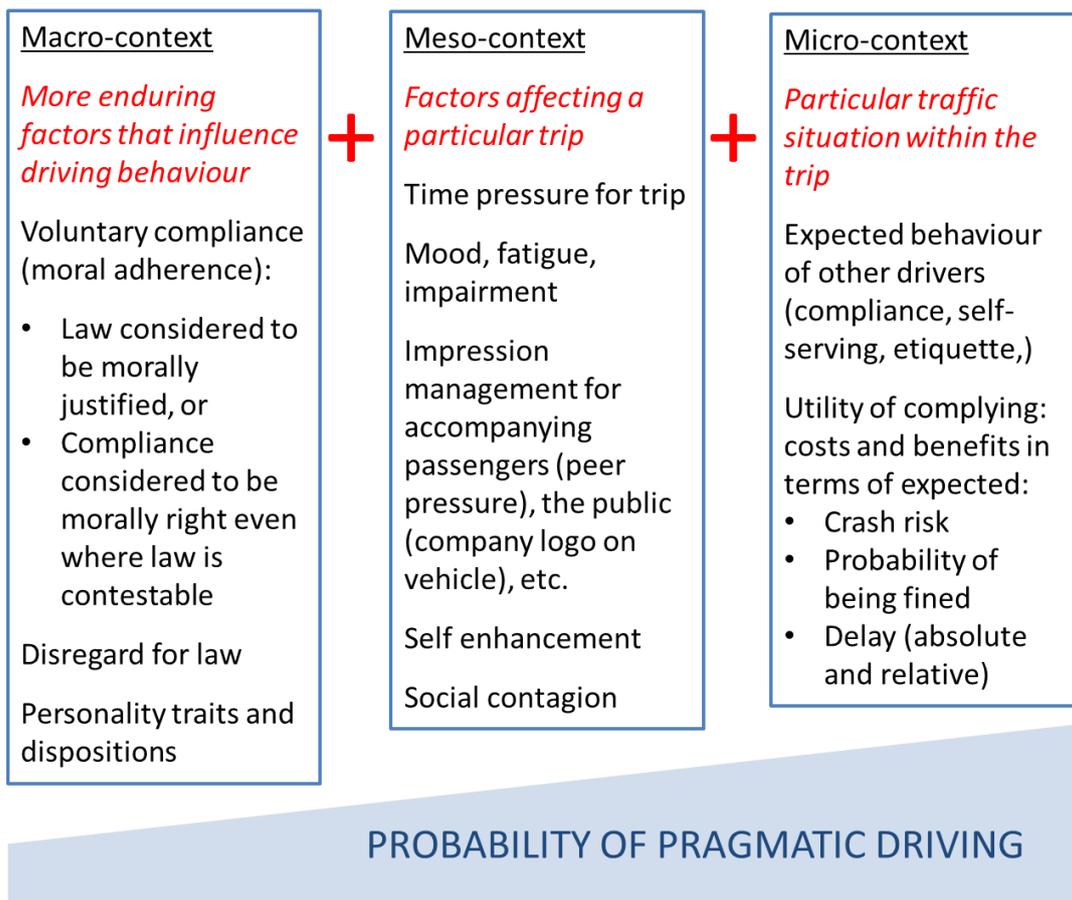


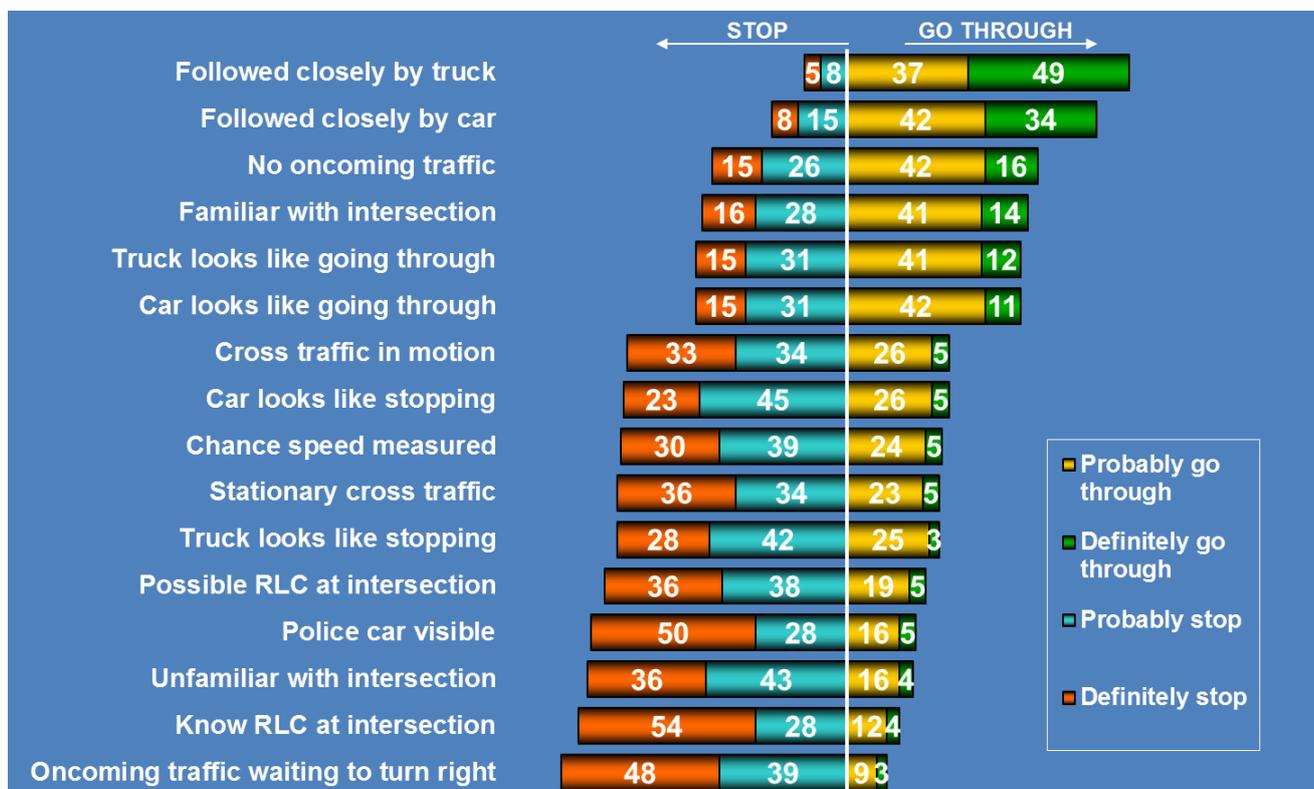
Illustration of micro-context factors involved in pragmatic driving

Examples of micro-context factors involved in pragmatic driving can be identified in an unpublished study of driver behaviour approaching signalised intersections in Queensland (AC Nielsen, 2002a,b,c). It should be noted that the situation examined was not one of noncompliance with the law, however the factors influencing behaviour are expected to be the same. The study was commissioned by Queensland Transport (who have given permission for its use) to understand awareness and behaviours in relation to red light cameras. The author designed the questionnaire and established the methodology in consultation with AC Nielsen: a random telephone survey with 504 residents (304 in Brisbane, 100 each in Toowoomba and Townsville) aged 17 or above and holding a current Queensland drivers licence. They were given the following scenario:

“I’d like you to imagine that you’re driving a car, and you’re approaching an intersection with traffic lights. The lights change from green to yellow just as you get close. You would have to brake quite hard to stop, but if you go through, the light might turn red before you reach the other side. As you might know, it would not be illegal if you did go through. In this kind of situation there are many things that might make you more likely to stop, or more likely to keep going. I’ll mention some of these, and after each one I’d like you to tell me what you think you would do. There is no right or wrong answer, it’s just how you think you would react.”

Respondents were then presented with a series of 16 scenarios with different characteristics, with the order of presentation changed from respondent to respondent: no oncoming traffic; oncoming traffic waiting to turn right; stationary cross traffic waiting at the lights; no waiting cross traffic, but traffic in motion approaching the lights; truck/car is following very closely; truck/car is alongside and likely to go through/stop; definitely/possibly a red light camera at the intersection; chance speed could be measured; police car visible; familiar/unfamiliar with intersection and sequence of lights. The results are presented in Figure 2.

***Figure 2. Percentage of drivers who would stop or proceed upon a yellow light, by scenario
(Source: AC Nielsen 2002a, slide 20)***



Respondents were most likely to stop when there was a collision risk with oncoming traffic waiting to turn right (87% definitely/probably stop), stationary cross traffic that could start when the light changes (70%) and cross traffic heading towards the lights (67%). When there was no oncoming traffic, only 41% would definitely/probably stop. When a collision from behind was possible, respondents were most likely to go through, with only 13% and 23% definitely/probably stopping if followed closely by a truck or car respectively

The influence of deterrence can be seen in the scenarios where drivers know there is a red light camera at the intersection (82% definitely/probably stop), a visible police car (78%), a possible red light camera (72%) or a chance their speed could be measured (69%). Interestingly, these figures are of the same order as the figures for the scenarios where going through the yellow presents a collision risk. The presence of a known red light camera or a visible police car also changes the balance within those who would “definitely/probably stop” in favour of “definitely stop”. Familiarity with the intersection is important, with more willingness to stop when the intersection is unfamiliar (79% definitely/probably) than when it is familiar (44%).

An interesting influence was the perceived behaviour of vehicles travelling alongside the driver, where drivers were less likely to report definitely/probably stopping when alongside a truck (46%) or car (46%) they thought was likely not to stop, compared with travelling alongside a truck (70%) or car (68%) they thought was likely to stop. It is not clear whether this is an assumption that the other driver has better information on which to make the decision, an assessment of physical protection if there is conflict with traffic in the intersection (though the truck/car weight differential might have been expected to have an influence), a simple reliance on “safety in numbers” or the outcome of a form of social pressure.

The results show that driver decisions in the micro-context, although they take place rapidly, involve assessment of other drivers’ likely behaviour (will turn/go though), the risk of collision, the likelihood of enforcement and familiarity (which is related to prediction of the behaviour of other drivers and collision risk, e.g. when the cross traffic will get a green light). It is worth noting that in

every scenario there was a proportion of drivers who would probably/definitely not stop, regardless of the possible contingencies.

Pragmatic driving in LMICs

Familiar scenarios in LMICs include crowded roads where lanes are ignored, roundabouts where everybody enters and then slowly negotiates a way through, red lights that are violated on almost every change of lights, drivers going the wrong way down one-way streets, and motorcyclists driving against the traffic. However, despite this familiarity there is little available research that lends itself to a description of pragmatic driving.

In one exception to this lack of research, Kolnberger (2012) refers to Phnom Penh as being distinguished by “the seemingly chaotic traffic or the anarchic character of driving; a mixture of social conformity and chaotic individualism” (Kolnberger, 2012:5). His analysis of traffic in the city is based on theorising the transition from the road as shared unregulated public space to a regulated area with controlled access, and assessing the difficult shift from what was essentially pragmatic driving by default, to an uneasy mix of continued pragmatic driving (as a matter of custom and choice) and compliant driving, with increased legislation and enforcement.

There is an overlap between pragmatic driving and congestion, such that research which is focused on congestion in LMICs sometimes paints a picture that is clearly recognisable as pragmatic driving:

“The impact of poor lane discipline, especially at traffic junctions, deteriorates the already overcrowded junction situation. Furthermore, drivers frequently jump red lights and block the intersection, causing further traffic congestion. These problems are compounded by the fact that traffic law enforcement is poor, thereby providing no incentive for drivers to follow the rules.” (Jain et al, 2012:2)

In addition, the author has a longstanding interest in road safety in LMICs and has made observations in several countries that are consistent with those above. Some examples follow:

“I was trying to see how people negotiated the intersection [in Khon Kaen, Thailand]. If a reasonable flow had built up in one direction it would continue, until either a gap appeared or another vehicle (from another approach) has edged sufficiently into the stream to cause it to slow, eventually edging enough to make a space. Motorcyclists used cars, buses and trucks as cover if necessary, otherwise they had to make their own way through. Turning left is easy and seems not to consider through traffic.... Motorcycles in particular look for opportunities to flow through in various innovative ways, even turning right into the wrong side of the road, negotiating through oncoming traffic.” (King, 2005, Appendix 3.5:22)

“One of the differences between Hanoi and Australia with respect to road use behaviour is the blurring of boundaries and limits, and the interpermeability of territory. Unlike Australia, where road use for most classes of road user is strictly delimited (in practice as well as in law), this is not the case in Vietnam – motorbikes ride onto the footpaths, where pedestrians don’t have automatic right of way, pedestrians walk on the road (often through lack of choice), vehicles frequently use the “wrong” side of the road when driving, do not stop at traffic lights, begin a left turn from the right hand side of the traffic flow, etc.” (Excerpt from observation note by author)

“One of the characteristics that marks the traffic here [Hanoi], especially in merging, is that the riders of motorcycles and bicycles (and possibly car drivers) seem to ride into an intersection or stream of traffic paying no attention at all to the traffic there. This is most

obvious when a motorcyclist turns into the traffic from a side street – there is no movement of the head to look at the traffic, possibly because this concedes some kind of advantage to the traffic. Similarly, road users rarely respond to horn blowing with any indication that they have heard it, apart from perhaps moving out of the way. If they can't move out of the way, they just seem to ignore it. Presumably they have registered that there is a vehicle there, but it is far from clear to me whether this is considered important at all.” (King, 2005, Appendix 3.5:22)

“...making eye contact with drivers or motorcycle riders [in Bangkok] doesn't do any good – it just lets them know that you've seen them, so they feel confident about continuing without a change of speed. So you have to pick a gap and begin walking – warily, but smoothly. Because of all the motorcycles and *song taews* [public transport – a one-tonne light truck with a canopied rear lined with bench seats] diving in and out, there are no orderly lanes of traffic, unlike Australia, so a temporary gap is still chancy. If you walk slowly but continuously, both the oncoming straight and weaving traffic can anticipate you, but you have to keep an eye on what's coming behind the oncoming vehicles as well. If people do stop for you, it's usually not because they're doing you a favour, but because they see it as their duty not to run you down.” (King, 2005, Appendix 3.5:20)

“At intersections [in Beijing] it is much more chaotic as drivers and cyclists play a restrained form of chicken, taxis blowing their horns in warning. At times the taxis went through red lights, particularly when turning right (left in Australia), and cyclists were even more likely to ignore the red light and negotiate a way through. Pedestrians also did this, even on marked pedestrian crossings, which appear to be ignored by drivers and used by pedestrians simply because it's a convenient place to cross. At one time, when turning right under an underpass, the taxi had opposing traffic (also turning) going by on both sides of him.” (Excerpt from observation note by author)

Further similar observations by the author have been made in these countries as well as in Cambodia, Ethiopia, India, Indonesia and the Philippines. The concept of pragmatic driving emerged in part from a motivation to make sense of the traffic behaviour observed across these different countries.

Implications for achieving voluntary compliance

The evidence outlined above presents a picture consistent with the thesis that pragmatic driving is common in LMICs, although as yet (for obvious reasons) there is a lack of systematic and focused research. For example, it would be possible to articulate the relationships between the factors in Figure 1 in a more detailed way, including feedback loops between the experience of non-compliance by other drivers in the micro-context and individual drivers' commitment to compliance in the macro-context. This requires applied traffic psychology research which takes into account the difference in social and cultural context (King, 2005). However, even in the absence of such research information, it is important to consider the implications of pragmatic driving for the achievement of compliance with traffic law in LMICs, as this could point to promising interventions.

Returning to Figure 1, it can be seen that an important factor in the micro-context is the driver's expectation of the behaviour of other drivers. When a roundabout needs to be negotiated, if drivers expect that other drivers will simply enter when they can without heed for the legal right of way, it is logical to do the same and therefore avoid excessive delay. Even drivers who believe that compliance is morally right have been shown to “relax” their compliance in response to situational factors (Tapp et al, 2015). Therefore it appears that the objective of interventions intended to

reducing pragmatic driving should be to change expectations of other drivers' behaviour, which in effect means changing the actual behaviours, i.e. achieving compliance.

The evidence available from studies that demonstrate an improvement in long term compliance with traffic law generally shows that sustained enforcement is required (Fell et al, 2008; Terer and Brown, 2014). Unfortunately, LMICs lack the police resources to achieve such a sustained effort (Forjuoh, 2003). It is common for traffic police to spend much of their on-road time directing traffic to help ease congestion, i.e. in a situation where detaining drivers to issue a fine will make the problem worse rather than better. As a result of the inability to sustain enforcement levels at anywhere near the levels employed in Australia (e.g. see Ferris et al, 2013 re intensity of random breath testing), offences such as drink driving and speeding remain at high levels in LMICs (e.g. Damsere-Derry et al, 2015; Jia et al, 2015).

Even in HICs sustained enforcement has been selective in terms of the particular laws enforced. In Australia the first documented successes were in the area of drink driving, with sustained high levels of random breath testing (Bates et al, 2012). Speed has been a more important focus in the past two decades (Bates et al, 2012), though without sacrificing the intensity of random breath testing. Notably, enforcement intensity for both these offences relies on a combination of technology and the use of techniques that have been developed and evaluated over a period of time, as well as the commitment of personnel and funding. LMICs face challenges in all of these areas of capacity. On the other hand Vietnam has successfully achieved a substantial change in motorcycle helmet wearing through legislation and enforcement (Passmore et al, 2010) that has not required sophisticated technologies or techniques.

In terms of Figure 1, the “flagship” enforcement approaches to drink driving, speeding and helmet wearing operate on the meso-context rather than the micro-context: drink driving and non-wearing of helmets operate for the entire trip, and although speeding is ephemeral, it is common for drivers to adopt illegal speeds for a number of sectors of a trip rather than just one or two. In contrast, pragmatic driving is most common in the micro-context, i.e. a specific situation at a specific location. Across the road system there are so many such locations that the possible number of enforcement locations is much greater than those used for drink driving and speeding enforcement. This multiplies the challenges for LMICs.

Furthermore, while enforcement approaches for drink driving, speeding and helmet wearing allow police to focus on a single high profile behaviours for which individual drivers can readily be held responsible, pragmatic driving involves clusters of non-compliant behaviours that are a product of interactions between a number of drivers. In addition, these non-compliant behaviours can be perceived by all the drivers concerned as justifiable for the very reason that they are pragmatic – they enable drivers to achieve their mobility objectives better in the given situation. While speeding also has a mobility rationale, it involves a risk to other drivers, as does drink driving, while not wearing a helmet has no mobility benefit as well as presenting an individual risk.

Pragmatic driving therefore presents a complex enforcement problem: limited police resources, and a diffuse non-compliance problem that is spread across the transport system, and involves cooperation between numerous drivers for a perceived benefit. A possible approach which (to the author's knowledge) has not been systematically applied and evaluated would be to selectively target particular locations with supporting publicity about both the correct way to drive at that location and the fact that enforcement will be applied there. The locations and road rules to be enforced would need careful selection to ensure that a shift to compliant behaviour would not exacerbate congestion. With a sustained, localised effort, drivers would ideally develop experience with the way the micro-context operates when all drivers comply with the traffic laws, which would enable the enforcement approach to be shifted to other locations. This is based on an assumption

about the generalisability of compliant behaviour which requires testing. An evaluation would also be required to establish the level and duration of sustained enforcement required; positive or negative impacts on mobility; the degree of recidivism by drivers when the enforcement is shifted elsewhere and the related benefits of “top-up” enforcement; and changes in intention to comply with the law among drivers. If the impact on mobility is positive, this could be used to support publicity promoting adherence to the law, as already occurs in relation to speeding and mobility in Australia (e.g. RACQ, n.d.).

Conclusion

Lack of compliance with traffic law is common in LMICs. It is proposed that such non-compliance takes the form of pragmatic driving, defined as driving behaviours that achieve personal mobility aims while optimising perceived safety and enforcement risks, regardless of the legality of the behaviours involved. A model that specifies a macro-, meso- and micro-context for driving behaviour is also proposed, and postulates that compliance with the law is mostly an influencing factor at the macro-context level, whereas pragmatic driving is mostly a product of driver interactions in the micro-context where intention to comply is frequently overridden by pragmatic considerations related to mobility. Research is needed to confirm this account and to enable the further elaboration of the model, however some of the implications for practice can be drawn out. The difference between this pattern of non-compliance and traditional enforcement targets such as drink driving, speeding and helmet wearing presents a number of challenges to police in LMICs, which are exacerbated by their lack of resources relative to HICs. It is hypothesised that a promising approach is sustained, localised enforcement with supporting publicity, with evaluation of the resource needs, maintenance of impact and generalisability of results.

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