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BREAKING THE LAW

Rule violations as social norms on India's roads

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Breaking the Law: Rule Violations as Social Norms on India's Roads

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Abstract

This paper adapts existing theoretical frameworks of social norms and their interactions with laws to study the case of rule violations in Indian road traffic. Specifically, we look at the case where existing laws and rules are violated with such regularity that breaking the law becomes the social norm. We investigate this framework in the case of road user behaviour in (urban) India, where road safety and traffic violations have been focus of recent policy changes. We propose that a lack of road discipline and traffic violations have an impact on road safety as well as congestion. These, in turn, have implications for the economic productivity and development of a country, as well as the well-being of its citizens. Our application of the framework suggests conditions of enforcement under which such harmful social norms can be broken. Policy interventions and scope for behaviourally-informed policies targeted at improving road user behaviour are discussed.

Keywords: road safety; mobility; congestion; nudging; expectations

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Can some rules be violated with such regularity that these rule violations become a social norm? Recent research that investigates the intersection of laws and social norms (Acemoglu & Jackson, 2014; Basu, 2018) suggests that when laws are at odds with prevailing norms in a society, they become ineffective. This paper seeks to apply a theoretical framework based on this recent research and Bichhieri's (2006a, 2017) work on social norms. This framework is then applied to understand the case of traffic rule violations in India, having substantial implications for road safety as well as urban economic development. We suggest interventions that go beyond increased enforcement, monitoring, or financial sanctions to improve the behaviour of road users, namely, pedestrians and motor vehicle users.

One of the primary implications of traffic rules being violated regularly relates to the safety of road users.[1] With 11 deaths per 100,000 people (see Figure 1), India is in the median position globally with respect to the number of fatalities arising out of road-related accidents. Russia tops the global chart with 19 casualties per 100,000 individuals (Ministry of Road Transport and Highways, 2017). There have been various explanations for country-wise disparities in road fatalities, including road design, law enforcement, and vehicular density. Literature suggests that such between-country differences could explain how success (or lack thereof) in reducing road fatalities in one country does not necessarily generate similar results in others (Wegman, 2017). For example, mobility and congestion varies widely between these countries largely on account of vehicular density, but also due to traffic monitoring and enforcement of traffic law.[2]

[1] For a larger explanation of risk factors associated with road traffic injuries in developing countries, we refer the reader to Odero *et al.* (1997)alcohol use, and traffic violations (such as speeding) explain road traffic injuries and deaths.

[2] A cross cultural study on the association between traffic violations and self-report accident involvement in Greece, Turkey, Sweden, and Finland also suggests that there are significant differences between drivers in these countries and their potential associations with traffic accidents (Warner et al., 2011)

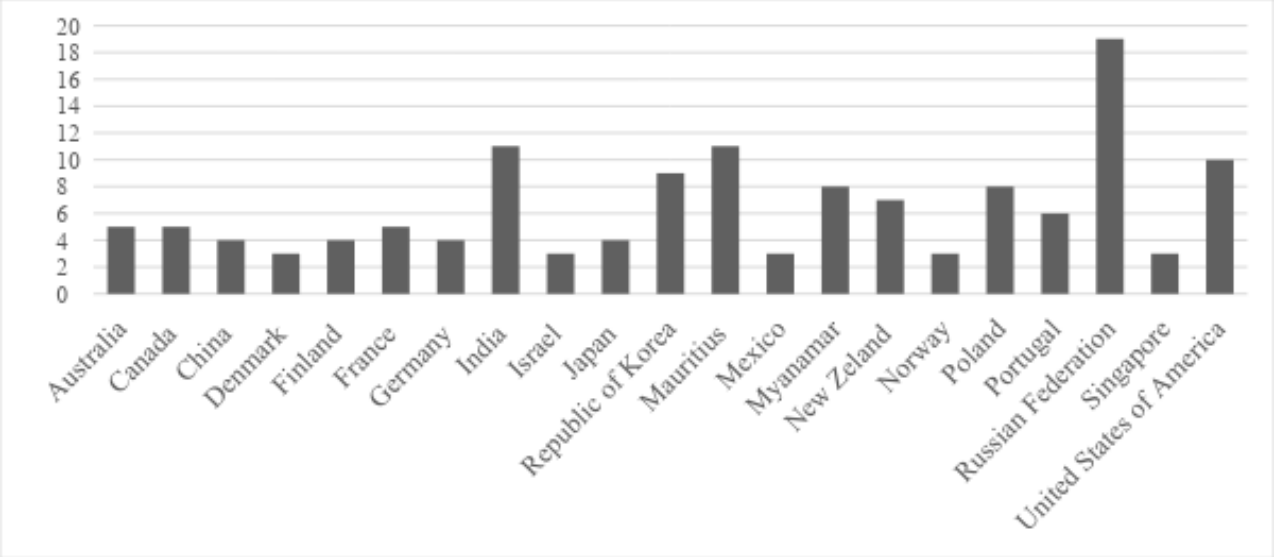

Figure 1: Country-wise road-related deaths (killed per 100,000 persons)

Source: Ministry of Road Transport and Highways (2017)

In India the causes of deaths due to road accidents have been recently examined using government data (Ministry of Road Transport and Highways, 2018). Even as average speeds reduce due to increasing road congestion (NITI Aayog & The Boston Consulting Group, 2018), the absolute number of road-related deaths remain high (nearly 150,000 deaths in 2017). However, since 2005, the number of road-related deaths per thousand vehicles has nearly halved (from 1.5 in 2005 to 0.8 in 2015). This reduction in fatalities could be attributed to a number of causes: new road legislation, changes in road infrastructure and design, law enforcement, and lower average speeds due to increased motorization and congestion (Staton et al., 2016). Our focus in this paper is largely on the latter two, since our primary interest is in road-user behaviour. Otherwise known as Smeed's Law (Shinar, 2017, p. 22), this suggests that road fatalities could be reduced partially due to greater road congestion and vehicular density (Jacobs & Cutting, 1986; Ministry of Road Transport and Highways, 2018), but that they still remain high in absolute terms. Recent estimates of the economic cost of road-related deaths suggest that India loses nearly 3% of

its GDP every year, nearly $58 billion (Quium & Rasamit, 2013) due to this. Another study by the World Bank (2017) suggests that India could improve its GDP by 16.3% by reducing road-related deaths over the next 24 years.

A large majority of fatal accidents in India occur due to over-speeding (66.5%). Other prominent reasons leading to fatal road accidents were overtaking as a fault of the driver, intake of alcohol and other drugs, and 'distractions while driving.' This is reported in Figure 2.

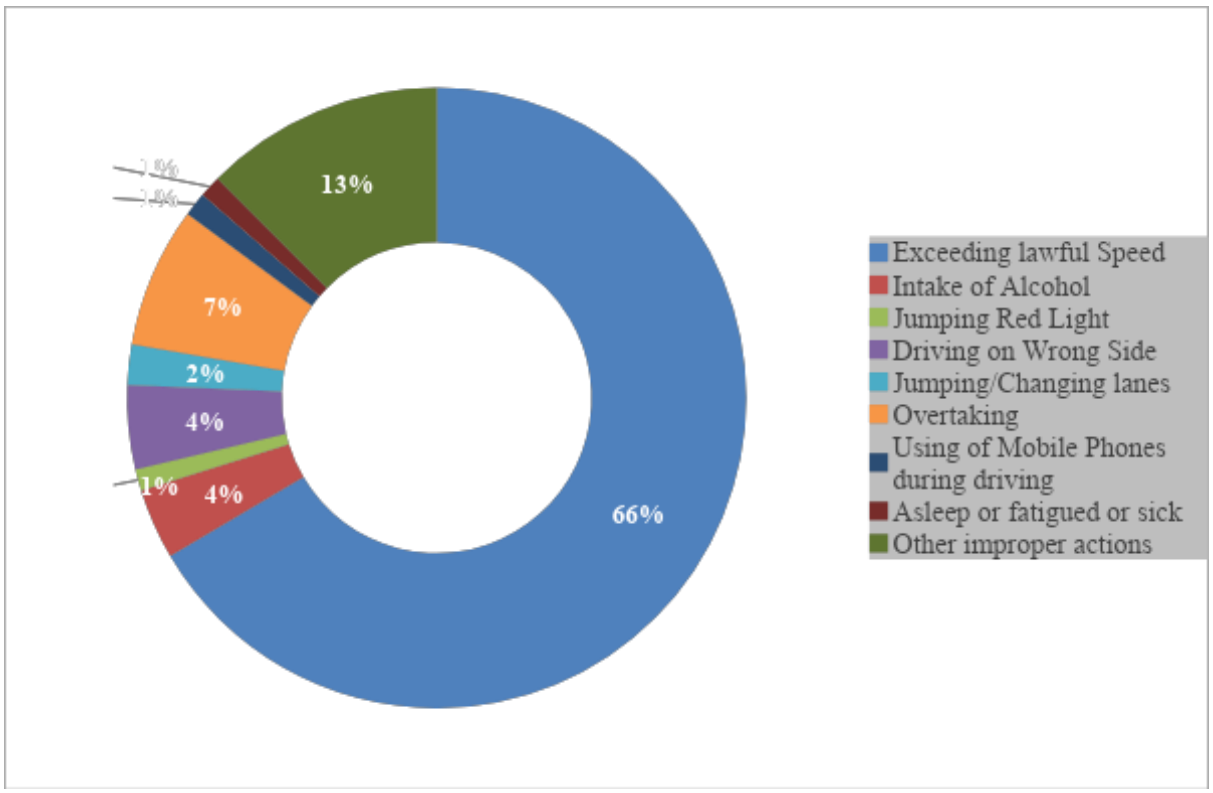

Figure 2: Major Causes of Road Accidents in India, 2016

Source: Ministry of Road Transport and Highways (2018)

Another outcome typically associated with lack of compliance with traffic laws is road congestion, which hampers economic productivity of road users in particular. As Akbar et al. (2018) show,

there is a positive correlation between urban economic development and improved mobility in Indian cities, but that congestion mediates this relationship. Traffic congestion can also have significant implications for social welfare due to increased unproductive time spent in gridlock (Kreindler, 2018). There are three potential reasons for traffic congestion: one involves the increase in motor vehicles on roads that does not keep pace with the availability of road infrastructure to support them. Second, road design and infrastructure may not have adapted to increases in motorization, leading to greater congestion on ill-equipped roads. Lastly, road users do not comply with traffic rules leading to a coordination problem that results in traffic congestion. To reiterate, since our focus is largely on road-user behaviour, we restrict our analysis to the third factor. Furthermore, as Forward (2009) suggests, traffic congestion and road accidents are closely linked to breaking traffic laws.

The effects of road related deaths, however, may not be uniformly spread across society. In India, nearly half of all deaths are among vulnerable road users, such as motorcyclists, pedestrians, and cyclists (Ministry of Road Transport and Highways, 2017). To curb such numbers, there was a bill introduced in the Indian parliament in 2016 that proposed harsher fines and penalties for traffic offences such as drunk-driving, over-speeding, and non-compliance with seatbelt/helmet laws (SaveLIFE Foundation, 2017). However, breaking traffic laws may not solely be the domain of road users but could also include pedestrians[3] and other vulnerable agents.

[3] It is often a common sight in India to observe pedestrians crossing busy junctions without attention to designated crossing areas or traffic signals. The idea of jaywalking seems to be one of the few cultural traits ingrained within an otherwise heterogeneous population. Despite Indian laws having provisions to fine jaywalkers (Bagai, 2011) for endangering their own lives as well as lives of others (a fine of INR 100, or ~$1.3), jaywalking persists. This is despite recent infrastructural changes involving provision of infrastructure such as subways and sidewalks. In 2014, in the financial capital of Mumbai, the police reported that there have been no cases filed as it is seen as a 'continually prevailing' norm. The concept of jaywalking in India is one such example of traffic violations occurring as a result of a prevalent social norm. However, jaywalking consists of only a small portion of overall traffic violations.

Data on country-wide traffic violations in India is sparse owing to traffic enforcement being largely a city-level activity. According to traffic police data from Mumbai and Bangalore, the most common traffic violations booked are for: a) riding without a helmet; b) parking in no parking zones; c) jumping signals; d) carrying goods dangerously; e) not wearing safety belts; and f) cases of drunk-driving (Gandhi, 2016). The volume of traffic violations varies largely by the number of road users in each city as well as the intensity of enforcement: for example, Bangalore Traffic Police reported nearly 9 million cases as of 2016 (Menezes, 2017), while the Mumbai Traffic Police reported only 1.7 million cases (Narayan, 2017). A potential explanation for this stark difference could be that Bangalore has nearly 3 times as many registered vehicles as Mumbai.

Traffic Enforcement in India

The Indian state's capacity to monitor individuals is improving, but there is a wide disparity between the number of law enforcement agents and the population. From one police constable to 687 persons in 1998, it improved to 563 persons in 2008, and now stands at one police personnel for every 518 persons. As Figure 3 shows, this is much lower than the ratio for countries such as Brazil and Russia, and marginally lower than Asian counterparts such as Indonesia and China.

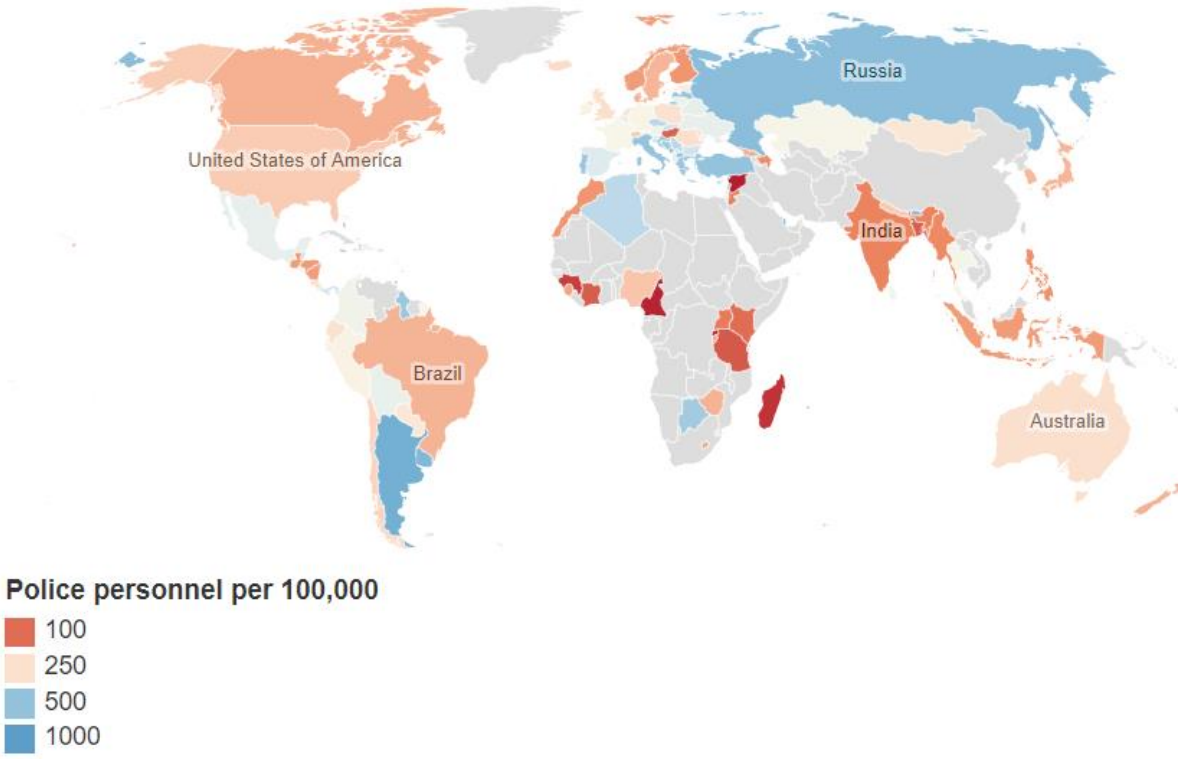

Figure 3: Global Distribution of Police Personnel per 100,000 (average, 2003-2015).

Note: Grey coloration indicates no data available.

Source: United Nations Office on Drugs and Crime (UNODC; 2018)

However, data specific to traffic police is scarce, who make up only a small fraction of the total police force. As of 2015 in India, there was one traffic police personnel per 17,736 persons and 2,915 vehicles (Bureau of Police Research and Development, 2017). In administratively smaller, but heavily motorized areas such as Delhi, this ratio improves to about 1 traffic police staff per 1545 vehicles. The problem of enforcement is further compounded by notable observations by parliamentary committees that there are various agencies investigating road safety in India, resulting in a lack of coordinated policy action (Sundar Committee, 2007).

As a result of the high number of fatalities associated with traffic accidents, the government of India proposed an amendment to the Motor Vehicle Act in 2017. This was the first time the bill

had been amended since it was first enacted in 1988. The new bill sought to increase the fines and penalties for various traffic violations and offenses, contingent on state governments adopting this. Some of them are as follows: Not wearing seatbelts and helmets can result in a fine up to ₹1000 with suspension of license. The penalty for drunk driving has been increased from ₹2000 (~USD 28) to ₹10000 (~USD 140), whereas speeding is an offence that is penalized with a fine of ₹ 5000 (~USD 70).

Review of traffic violations literature

The theory of reasoned action (TRA) originally proposed by Fishbein and Ajzen (1975), provided a model which helped predict intentions and behaviour for a wide spectrum of ideas. According to them, behavioural intentions, in most scenarios, would be the best predictor of behaviour that is subsequently undertaken. Behavioural intentions can be understood by two different factors, that is, attitude towards the behaviour and subjective norms of a particular group. The extent to which these two factors differ depend on the behaviour being considered. The theory of planned behaviour (TPB; Ajzen, 1991) extends this model by including another primary predictor variable, that of perceived behavioural control. This shows "people's perception of the ease or difficulty of performing the behaviour of interest" (Ajzen, 1991, p. 183). Parker et. al. (1995) attempt to study the adequacy of the theory of planned behaviour in predicting intentions of an individual to commit driving violations. The study was undertaken by trained market research interviewers to a sample size consisting of 600 drivers belonging to five different age groups. There were three driving violations that were proposed in the study: a) cutting across lanes of traffic in a motorway to exit at the correct junction; b) weaving in and out of traffic in a two-lane motorway; and c) overtaking on the inside of the motorway. The study showed the significance of perceived behavioural control in the prediction of intention to commit a range of driving violations. It also

pointed out the significance of personal norms in tackling the problem of irresponsible driving in the future.

In the traffic psychology literature, TRA and TPB are predominantly used to explain traffic violating behaviour (e.g., Lheureux et al., 2015), but these theories are not devoid of criticism. The most significant one is that these theories are not falsifiable and whether they are statements based on common-sense that cannot be falsified (Greve, 2001; Ogden, 2003; Smedslund, 2000; Sniehotta et al., 2014; Trafimow, 2009). A theory must be falsifiable to be a good theory.

Another area where the TPB has been criticized is with regard to the predictive validity of the theory. The theory emphasizes rational reasoning and forgoes certain other aspects that may be vital such as unconscious influences on behaviour (Sheeran et al., 2013; Sniehotta et al., 2014).

Road safety research has evolved from viewing accidents as occurring due to a lack of skills needed to drive, to understanding that accidents are based not on what the driver cannot do, but what the driver can do. Forward (2006) outlines three different human failures: Violations (speeding, drunk driving), errors (failing to see misjudgements), and lapses (forgetfulness). Violations are actions undertaken purposefully and are found to predict road accidents. Using qualitative data on perceptions of violations, Forward extends Parker et. al.'s (1995) study and finds that there are mainly four broad reasons why road users could commit violations:

(a) Attitude: most people did not believe that speeding on a major road was a violation; however, overtaking without a clear view was classified as the most dangerous followed by overtaking in an urban setting.

(b) Perceived behavioural control: people would speed if they believed that they would reach the destination quicker. However, non-violators believed that it would be extremely hard to brake on time if there were pedestrians crossing and therefore their losses outweighed their perceived gains.

(c) Subjective norms: people were often provoked when their driving styles had come into question, although data remains ambiguous on this.

(d) Habit: described essentially as past behaviour, individuals who would be violators had been past offenders. However, there was a small portion of violators who reported that they would not undertake such an act again.

Joewono et al. (2015) empirically explored why traffic norms are violated specifically by motorcyclists across three different cities in Indonesia using a structural equations approach. They found that traffic violations occurred as a result of the rider attitude towards that behaviour, prevailing social norms, perceived behavioural control, moral norms, and the thrill-seeking behaviour of the rider. Extending these findings, another internal factor that plays a vital role is the driver's moral norm. Holman and Popusoi (2018) showed that drivers self-exonerate when breaking traffic rules through four strategies that they feel legitimize their actions:

a) *Minimizing risks of traffic violations*: the consequences of violations are distorted or minimized by drivers as most traffic violations do not often bring negative consequences.
b) *Displacement of responsibility*: in many cases, it was found that drivers try to shift the blame regarding why they would violate traffic norms to environmental factors or physical conditions.
c) *Personal needs-based justification*: this strategy sees an individual justify their behaviour due to ongoing personal problems or if there were a perceived increase in convenience that arises out of violating traffic norms.
d) *Outcome-based justification*: in this an individual justifies behaviour on the grounds that it creates a better traffic environment.

The results derived from the study validated these four strategies as a novel manner for addressing drivers' tendencies to justify their traffic violations.

However, as suggested earlier, drivers are not the only ones culpable for traffic violations, as pedestrians also often play a role. In low income - countries, pedestrians account for 45% of road fatalities, where as they account for 29% in middle income countries (Naci et al., 2009). A significant jump in the number of pedestrian fatalities has been seen India. Data shows an increase from 12, 300 in 2014 to 20,500 fatalities in 2017 has occurred (Dash, 2018). The general attitude towards such accidents is that they consider the driver to be culpable. Moyano Diaz (2002) uses the theory of planned behaviour to explain pedestrian behaviour, applying it to road-crossing in the absence of pedestrian crossing facilities. The results of the study, that was undertaken in Chile, show that pedestrian behaviour significantly contributes to their accident involvement. It also shows that young adults, those who are between 17- and 25-years old commit more "violations, errors, and lapses" as pedestrians. This is similar to the results found in relation to driver behaviour. Therefore, it was concluded that traffic accidents can be highly associated with young adults, specifically young males. The paper concludes with the statement that pedestrian's behaviours to commit traffic violations are determined by their intentions and not due to subjective norms. The study concludes that this is a result of a lack of social and legal enforcement of pedestrian behaviour.

So far, in this section, we have looked at the justification used by rule violators for their errant behaviour. However, could there be something about the laws themselves that make them more or less prone to violations? Therefore, it is equally important to ask the question why certain laws are successfully implemented while others languish and are blatantly violated. Basu's (2018) recent

game theoretic approach to understand why certain laws are followed is instructive in this regard. He contends that the assumptions in mainstream analysis of law and economics are internally inconsistent and flawed. Traditional models assume that while citizens are selfish and utility-maximising agents, the state functionaries responsible for enforcing law (police, judges, bureaucrats, etc.) are robotic without their own ambitions and desires.

Basu argues that laws (particularly new laws) are just "ink on paper" and can bring about a change in people's behaviour in only as much as they can change their beliefs about what other people may or may not do. He uses the concept of "focal points," first developed by Schelling (1980), to argue that the only function that laws provide is to act as a catalyst for changing beliefs and moving society from a pre-existing low-level equilibrium to a better equilibrium that also pre-exists. These equilibria are defined as focal points, i.e., those choices of actions that are self-enforcing outcomes and that enable people to guess what others, with a common cultural background as theirs, are likely to do. We discuss this work in detail in Section 3.2.

Framework

There are many definitions and understandings of social norms with literature on the topic spanning across the fields of sociology, law, economics, anthropology, and social psychology. The most prominent contemporary theories of social norms have been advanced by Cialdini and Trost (1998), Fishbein and Ajzen (2011), Bicchieri (2006b), and Brennan *et al*. (2013). Each of these scholars use different terminology to describe social norms and the collective behaviours and reasons that lead to establishing these norms. However, as Mackie et al. (2015) point out, all the theories converge on three elements: a) social expectations (beliefs about what others do and

beliefs about what others expect one to do); b) presence of a reference network; and c) sanctions (overt and covert).

In this paper, we use Bichhieri's (2006a) definition of social norms because it brings together insights from social psychology and economics and is integrative of insights from other theories in social norms. She builds on the theory of descriptive and injunctive norms that Cialdini and Trost (1998) proposed. Further, her explanation of social norms uses the schema of preferences, beliefs, and expectations that is most relevant to our analysis in this paper.

According to Bicchieri, a social norm is a rule of behaviour that individuals conditionally prefer to conform to because they believe that (a) most people in their reference network conform to this particular behaviour (empirical expectation), and (b) that most people in their reference network believe they should conform to this particular behaviour (normative expectation). Therefore, a social norm is that behaviour which is followed because of social expectations and not because of an individual's personal preference irrespective of what others are doing.

Following this definition, to create a social norm, it is necessary to induce the right kind of expectations (empirical and normative) in a reference network. Further, to abandon a prevailing social norm, it is necessary to change people's expectations within their reference network. In the following subsection we develop a model based on this definition.

The Model

Assume a finite population of agents who are road users, $N = \{1, 2, 3 \dots n\}$, with $n \geq 2$. For any subsample $P \subseteq N$, there exists a social norm R if there is a sufficiently large proportion of P such that for each individual $i \in P$, i knows that R exists and bases her behaviour in situations S

upon beliefs and expectations described below. The assumption here is that there is a collective awareness about behavioural rules that arise from following established social norms.

Table 1: Summary of Social Norms in Bicchieri (2006)

	One's beliefs about		
	Self (i)	*Others (P)*	*Others 2nd Order*
Empirical expectations	What I am going to do	What others are going to do	What others believe I/others are going to do
Normative expectations	What I should do	What others should do	What others believe I/others should do
Normative expectations with sanctions	What I should do, falling which what I stand to lose	What others should do, failing which what they stand to lose	What others believe I/others should do, failing which what I/others stand to lose

Source: Adapted from Bichhieri (2017, p. 70).

(a) Empirical expectations: *i* complies if she believes that *P*conforming with R in situations of type S (or the same situation faced by *i*) is sufficiently large. Such expectations could be formed by

visual observation or inspection of the behaviour of all road users of similar type around in the urban congested road. Consider here an example of road user behaviour. There could be a significant proportion *P'* of all road users in a given city who prefer riding vehicles without using helmets. *R'*, is therefore, the behavioural rule that says helmets are *not* worn by all motorists (of two-wheelers) while riding (*S'*). *i* believes that a sufficiently large proportion of individuals follow *R'*, and therefore, *i* prefers not to wear a helmet.

(b) Normative expectations: *i* complies if she believes that Pconforming with R in situations of type S (or the same situation faced by i) expects i to conform to R in situations of type S. Such expectations may be developed from past experience of road use (in situations of type S), or from intergenerational transmissions of beliefs. As an example for road users, there could be a significant proportion *P'* of all road users in a given city who prefer riding vehicles without using helmets and expect others to ride their two-wheeler vehicles without using helmets. *R'*, is therefore, the behavioural rule that says helmets should *not* be worn by all motorists (of two-wheelers) while riding (*S'*). *i* believes that a sufficiently large proportion of individuals follow *R'* and also believes that a sufficiently large proportion of individuals expect *i* to conform to *R'*, and therefore, *i* prefers not to wear a helmet.

(c) Normative expectations with sanctions: i believes that a sufficiently large subset of P expects i to conform to R in situations of type S, prefers i to conform, and may sanction non-conformance. To model sanctions more explicitly, consider the case of private enforcement (where sanctions can be imposed via reporting to law enforcement; Acemoglu & Jackson, 2014). Consider another case of motorized road users, drivers of motor vehicles. There exists a large fraction of drivers (*P'*) who are speeding (*R'*) when driving in certain roads of a city (*S'*). This fraction of drivers also expects and prefers all other drivers to ignore speed limits when using these roads and could impede the path and pace of other road users who are not speeding (thereby imposing sanctions on their

safety while using the road). *i* believes that *P'* is sufficiently large and expects and prefers her to conform with *R'* (speeding) and impose sanctions if she is not in conformity with *R'* (i.e. driving at a 'regular' speed), and therefore *i* also ignores the speed limit when using these roads.

The social norm is followed by *P* for each individual *i* if (a) is fulfilled (necessary condition), and either (b) or (c) are fulfilled (sufficient conditions).

We now turn to the case where laws and social norms can interact on account of private enforcement and public enforcement (where there are fines or penalties over and above sanctions by other road users). This framework draws on Basu (2018) and Acemoglu and Jackson (2014). A representative road user, i, must choose a behaviour B_i (or an action), for particular types of strategic interactions, S, with other road users $-i$. One such interaction could be using the road populated by specific types of road users (e.g., a congested urban road).

A road user chooses a behaviour $B_i \in [0,1]$ having the belief of R in situations of type S, where the law in place, $L \in [0,1]$. If L = 0, then the law is strict and sanctions any behaviour, whereas if L = 1, then the law does not sanction any behaviour at all. The most extreme law-breaking situation is therefore when L = 0 but B = 1. L is, therefore, an upper bound on B_i, and the government can impose fines and penalties if $B_i > L$. With some probability α, the government may *not* observe a violation of the behaviour.[4] As noted in Acemoglu and Jackson (2014), there will be full compliance with a sufficiently large fine or penalty given that other road users are allowed to whistle-blow and report violations of rules.

Consider the case where road safety is a public good that requires coordination from multiple agents (in this case road users). In order to be safe, each road user must exert some effort (which

[4] Constraints to regulation and enforcement include scarcity of state capacity to monitor individual behaviour, rent-seeking within state machinery that supersedes the incentive to enforce certain laws, and arbitrariness in making of laws themselves.

is costly) such as using helmets, seat belts, abiding by speeding laws, or being below the acceptable maximum blood-alcohol levels when driving. Road safety is, therefore, a function of efforts of each road user i facing R in a situation S. Low road safety can be beneficial for some since they reach their destination faster or feel more comfortable while riding[5] and for some S, law violations may not be sanctioned or fined by public enforcement.

It is easy to see that road users here will try to match the behaviour of other road users by choosing B_i that is mediated by expectations of others' behaviour B_{-i}. Those who exert high effort (at high cost) may observe road users who exert low effort getting away with their potentially law-breaking behaviour and putting road safety at risk. Without a whistle-blowing mechanism (or adequate incentives to report), this could result in a low-level equilibrium where all road users expect a low level of road safety, and therefore R in situations of type S conflicts with existing L.[6] This is perhaps complicated further by mixed road use in countries such as India, where a multiplicity of social norms and expectations could be unfolding for any given situation.

3.2 Interaction between Laws and Social Norms

Basu (2018) also points out that the reason why many laws are flouted in emerging and developing economies is that citizens of these countries do not have a strong foundational belief that laws should be followed, and they think that others in their societies harbour similar beliefs. In fact, as he further points out, the state functionaries responsible for enforcing laws should also have beliefs

[5] A common argument in India against the use of helmets and seatbelts is that they are uncomfortable and hinder the driving experience of individuals (Hindustan Times, 2017).

[6] When costly whistle-blowing is introduced, Acemoglu and Jackson (2014) suggest that there could be behaviours "tolerated by society" that will not be reported, even if they are in violation of the law; for instance, in India this may be jay-walking. Under conditions where the penalties are small, there are also equilibria where law-breakers can whistleblow.

that if they do not enforce laws, then their actions would be punished by higher authorities. If this is not the case, then there will be an increased violation of laws.

This approach towards law uses a language very similar to that of social norms. In fact, as Basu (2018) himself points out the only difference between social norms and laws is that while social norms do not need state functionaries to enforce patterns of behaviour, laws "rely on the functionaries taking certain actions"(p. 111). Acemoglu and Jackson (2017) studying the interaction between social norms and law enforcement demonstrate that when there is a strong conflict between prevailing social norms and laws, laws backfire. Further, the authors recommend that laws should not be abruptly strengthened, rather they should be gradually imposed in a manner that is more in line with existing norms.

Alongside Bicchieri's framework, there is Smerdon et al. (2016), who focus on 'bad' social norms - those that can damage a group or result in generally inefficient outcomes. The authors argue that social norms initially evolved to overcome coordination problems or mitigate negative externalities. However, over time, due to changing incentives or group identity, they have persisted as 'bad' social norms that now promote inefficient behaviour. Their theoretical model incorporates the psychological idea of 'pluralistic ignorance,' where individuals, whose private preferences may differ from social norms, wrongly hold the belief that the majority have private preferences to maintain the current behaviour. The key factor behind such behaviour is a common feature in social interactions: uncertainty over everyone else's private values, despite knowing that there is some positive correlation. For example, private values may generally indicate that breaking traffic rules results in negative utility, and implicitly understand that others' private values are similar.

In such a setting, the theoretical and experimental results suggest that group size and strength of identity play an important role. They find that smaller groups are more likely to be able to break down persistence of bad social norms in the short run, but that over time a stronger social identity of the group ensures that a bad social norm prevails. The authors go on to suggest two interventions that could break bad norm persistence: (a) communication between individuals that signalled their choice beforehand to coordinate expectations; and (b) fully observing common values of following a bad norm. However, in the latter case, it remains less clear how to precisely compute common values, particularly in dynamic cases of rule violations where common costs are typically unobservable or noisy.

Traffic rule violations as social norms: Potential interventions

It is important to note that Bicchieri makes a distinction between conventions and social norms. Conventions are descriptive norms (only empirical expectations are met) that provide solutions to coordination games where a person's main goal is to coordinate with others. Social norms, on the other hand, provide solutions to mixed-motive games. For a social norm to exist, both empirical and normative expectations must be met and therefore, social norms often exhibit a trade-off between private and collective gain.

Going by this distinction made above, in most societies Going by this distinction made above, in most societies adhering to traffic rules can be considered as following *conventions*, "where the preference for conformity does not clash with self-interest" (Bicchieri, 2006a, p. 2). If violating a convention creates negative externalities, conventions turn into social norms where violations are sanctioned. Following traffic rules can, therefore, become a social norm where both empirical and

normative expectations are met, and any violations are expected to be sanctioned. In this case, social norms (of adhering to traffic rules) and laws agree with each other.

However, if there is a clash between personal and collective benefits, people might start breaking a law and expect others to do so as well, thus turning rule violating behaviour into a social norm. Rampant violation of a certain traffic law can therefore be thought of as becoming a social norm. This, in fact, can be true of any rule violation and not just of traffic rule violations.

When conceiving of social norms-based interventions[7] to curb traffic violations, it is important to note that misperceptions of norms are widespread (Bicchieri, 2017, p. 43; Bicchieri & Fukui, 1999; Jeff & Wesley, 2005). Often, individuals mistakenly believe that their perceptions, of what similar others are likely to do in situations, are almost entirely accurate. Such misperceptions are to be challenged and replaced by more factual beliefs, thus perpetuating a shift in the focal point. For instance, a Montana-based social norms strategy (Jeff & Wesley, 2005) to reduce impaired driving among the youth utilised an intensive and targeted media campaign to communicate real estimates of impaired driving (e.g., 4 out of 5 young adults don't drink and drive). This fact was in stark contrast to the misperception that over 90% of the respondents believed that young adults engaged in that behaviour (Jeff and Wesley, 2005). Social norms strategies, therefore, try to facilitate behaviour change, not through fear-based tactics, but through the identification of the gaps in perception between actual and estimated behaviours. The manner in which these norms are communicated through the use of framing principles also determines the extent to which violations will be encouraged or discouraged. For instance, when communicating that the majority of individuals do *not* drink and drive (i.e., do not violate the law), the frame motivates others to

[7] As Sunstein (1996) notes, there is ample scope for political actors and lawmakers to serve as *norm entrepreneurs*, who can suggest a "collective solution" when faced with free rider problems, as is often the case with road safety and traffic violations. One way in which such a change can be brought about is through public endorsements of specific behaviours, display of commitment to such behaviour for oneself, or making compliance with new norms "easier."

modify their behaviour to be a part of this majority. On the other hand, if the same communication is delivered via the "minority frame," i.e., a minority of people drink and drive, the message may encourage others to aspire to be a part of this exclusive minority by violating the law.

Thus, it is likely that most interventions based within a social norms framework will attempt to (a) collect accurate data regarding a violation; (b) collect misperceptions regarding the same violation; and (c) communicate the factual information to targeted audiences with the intention of correcting these misperceptions of negative payoffs over time, using an appropriate frame. From the model described earlier, both *R* and the perceptions of *R* across *S* are to be collected with the goal of communicating norms to the targeted populations. It is only when the perceptions of *R* are corrected, perhaps through an information-based intervention, that $B_i$can be expected to change. Although anonymous / private whistle-blowing by other road users is a possible technique for regulation, norms-based interventions often working within the prescribed *L* to ensure that $B_i$is less than or equal to L, to reduce violations to begin with.

For instance, in the context of drunk driving, the payoff from this behaviour to the driver may not be known with certainty. Furthermore, the agent, due to impairment from alcohol consumption, is unlikely to be able to make a decision on the basis of payoffs to self and others. Indeed, studies have shown that drivers who estimate a lower blood alcohol concentration are also more likely to be riskier drivers (Laude & Fillmore, 2016). Therefore, assumptions about the behaviour may be made based on this misinformation and misperception. An intervention based on social norms can (a) source data on how many people engage in drunk driving; (b) collect data on the perceptions and prevalence of drunk-driving behaviour among peers; and (c) correct misperceptions regarding the frequency and prevalence of norm violations through an informational intervention. As

Havârneanu and Havârneanu (2012) point out, lack of situational risk factors, which makes the laws seem more arbitrary, may be contributing to rule violation.

Dissemination efforts through transportation services like Uber and Ola may be useful. For instance, prevention of drunk-driving campaigns by corporations such as these serve dual benefits for public and private interests. Another spatial point of intervention may be at the valet services of pubs and bars. Providing information to correct misperceptions of social norms and their violations prior to the consumption of alcohol may alter subsequent decisions regarding impaired driving, perhaps not immediately, but with repeated reminders. However, as with any intervention that provides normative feedback to participants, the risk of a boomerang effect cannot be ignored (Schultz et al., 2007). Audiences (such as individuals who subscribe to memberships that permit free alcoholic beverages)[8] can be identified to make interventions more targeted, thereby increasing their chances of success. Similarly, campaigns for other violations such as speeding or lack of helmet use/seat belts can be used to make salient actual frequencies of such behaviours, to correct misperceptions of norm violation. Such targeted interventions should be complemented with concurrent penalties and fines, and vigilant enforcement as prescribed by law, since by themselves they are not likely to entirely deter traffic violations.

Conclusions and implications for policy

Our theoretical framework provides a first attempt at characterizing the rule violation prevalent among road users in India. In order to shift road users away from the low-level equilibria of "bad" social norms, it becomes important for the state to reassess laws in place and move beyond

[8] In India, the food service company, Zomato, for example, offers a subscription service (*Zomato Gold*) that provides members with discounted drinks and food. Tying in with their patrons will help target interventions where consumption of alcohol is common.

imposing penalties to sanction behaviour. We suggest various interventions motivated by emerging literature in economics and behavioural science on the intersection of law and social norms.

However, in suggesting these interventions, it is important to bear in mind that state capacity in developing countries such as India is severely constrained, not just in terms of financial resources, but also the administrative capacity to implement such changes in law. Imposing larger financial penalties via amendments to the Motor Vehicles Act have yet to be evaluated in terms of effectiveness in reducing road accident deaths. As reported in Section 2, there is a stark contrast in the number of traffic police personnel deployed to regulate traffic and enforce rules across nations.

There is evidence suggesting that implementing such interventions could take the route of behavioural insights in public policy, or via *nudge* units. For example, in Singapore, in shared paths between cyclists and pedestrians, the government is using visual cues to request cyclists to slow down, and pedestrians to pay more attention when they enter such shared spaces. In Amsterdam, the City of Amsterdam is running a randomized control trial (RCT) to ensure that cyclists adhere to traffic signals (Afif et al., 2019). Thus, the use of behavioural science units embedded within the local (or state) government that plan, design, and execute such interventions with the help of the traffic police could prove beneficial in this regard. Such an idea would not be entirely novel for India (Gupta, 2018; Tagat & Rao, 2016), especially since it has been mooted by other governmental agencies such as the Central Board of Indirect Taxes and Customs (CBIC; Press Trust of India, 2018).

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