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 the 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 on 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 reversed. Policy interventions and scope for behaviorally-informed policies targeted at improving road user behaviour are discussed.

Keywords: Road Safety, Mobility, Congestion Nudging, Expectations

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I. Introduction

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 and Jackson 2014; Basu 2018) suggests that when laws are at odds with prevailing norms in a society, they can become ineffective. This paper seeks to apply a theoretical framework based on this recent research as well as 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.[2] With an estimated 15.56 deaths per 100,000 people (see Figure 1), India is close to the world average (17.95) globally with respect to the number of fatalities arising out of road-related accidents. There have been various explanations for country-level disparities in road fatalities, including road design, law enforcement, and vehicular density. Literature suggests that such between-country differences could explain how success 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 differences in traffic monitoring and enforcement of traffic law.

Figure 1: Country-wise estimated road-related deaths (killed per 100,000 persons) – 2019
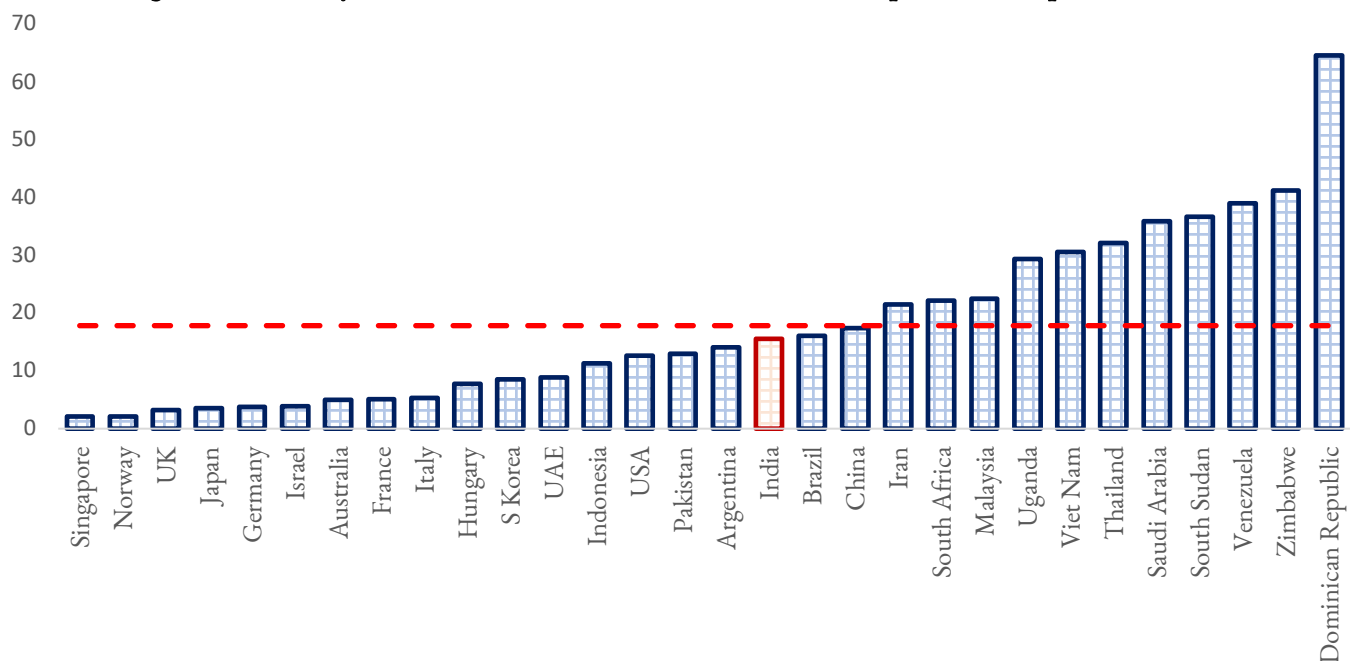
Note: Red dashed line represents world average (17.8) as of 2019.
Source: World Health Organization Global Health Observatory (2021)

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[2] 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.

In India, the causes of deaths due to road accidents have been recently examined using government data (Ministry of Road Transport and Highways 2018). 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.

Even as average speeds reduce due to increasing road congestion (NITI Aayog and 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. This is particularly of importance given increasing road congestion around the world. Smeed's Law (Shinar 2017, 22) suggests that road fatalities could be reduced partially due to greater road congestion and vehicular density (Jacobs and Cutting 1986; Ministry of Road Transport and Highways 2018)' but that they still remain high in absolute terms. Even when fatalities are not the major outcome of road accidents, there is still the possibility of road traffic injuries that could significantly affect quality of life for those involved (Dandona et al. 2008).

Research finds that both economic development as well as increased mobility (due to greater motorization) are positively associated with increasing road traffic injuries (Agarwala and Vasudevan 2020; Garg and Hyder 2006). 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 and 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.

Another outcome typically associated with lack of compliance with traffic laws is road congestion, which hampers economic productivity of road users. As Akbar et al. (2018) show, there is a positive correlation between urban economic development and improved mobility in Indian cities, but congestion mediates this relationship. Traffic congestion can also have significant implications for economic productivity (measured by monthly income changes) 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 outstrips the availability of road infrastructure to support them. Second, road design may not have adapted to increases in motorization, leading to greater congestion on ill-equipped roads. Last, 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.

Figure 2: Major Causes of Road Accidents in India, 2016
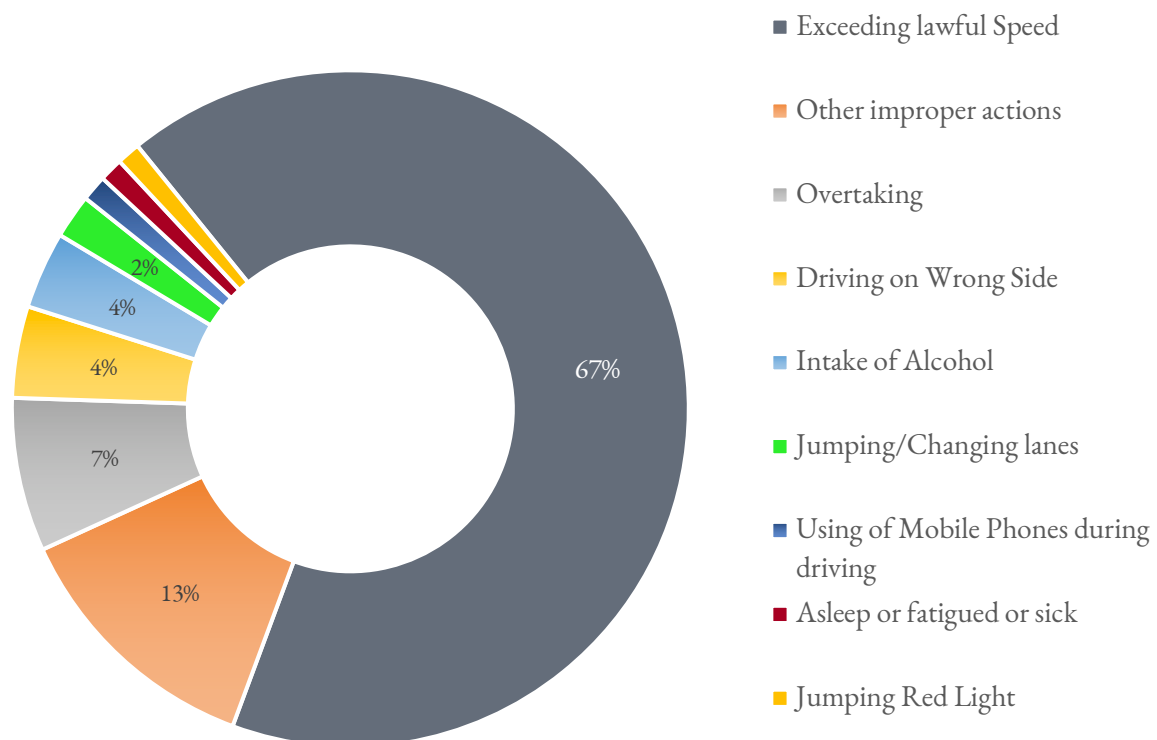
Source: Ministry of Road Transport and Highways (2018)

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.

Country-wide data on 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) 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

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[3] It is 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, though it makes up only a small portion of overall traffic violations as per traffic police officials statements.

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.[4]

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 in 2020 stands at one police personnel for every 512 persons (Bureau of Police Research and Development 2020). There are also large state-wise variations in this figure. 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).
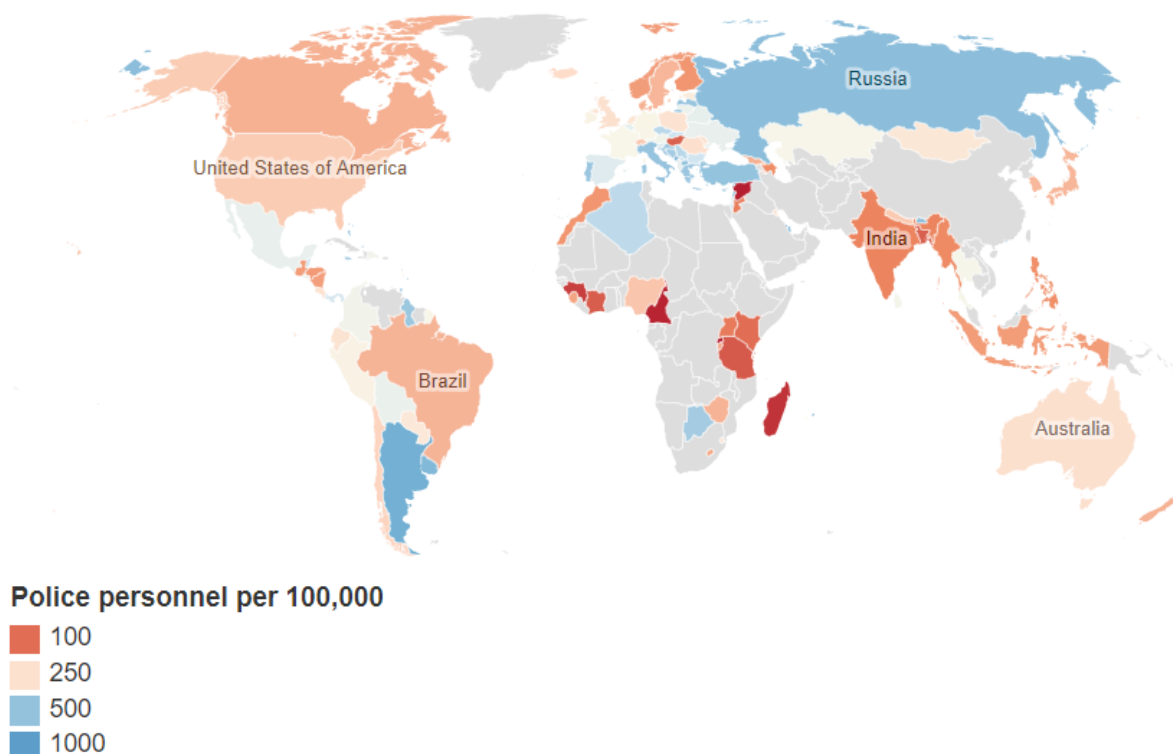
Note: Grey coloration indicates no data available.
Source: United Nations Office on Drugs and Crime (UNODC; 2018)

However, there is scarce data specific to traffic police, who make up only a small fraction of the total police force in India -- about 3% as of 2020 (Bureau of Police Research and Development 2020). This means that as of 2020 in India, there was one traffic police personnel per 17,736 persons and 2,920 vehicles (Bureau of Police Research and Development 2020). In administratively smaller but heavily motorized areas such as Delhi, this ratio improves to about 1 traffic police staff per 1545

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[4] It is plausible that motor vehicle registrations do not perfectly correspond to the number of vehicles on the road. Although there may be a high correlation, real-time data on traffic is highly variable and trip-level data is required to validate this assumption, which is outside the scope of the current work.

vehicles. The problem of enforcement is further compounded by the fact -- often noted by parliamentary committees -- that there are various agencies involved in monitoring 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 now penalized with a fine of ₹ 5000 (~USD 70).

II. Review of literature

This paper first reviews work in the behavioural sciences and traffic psychology that can be applied to study road safety behaviour. 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, 183). Parker et. al. (1995) attempted to study the adequacy of the theory of planned behaviour in predicting intentions of an individual to commit driving violations. The study involved a sample 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 explaining the intention to commit driving violations.

In the traffic psychology literature, TRA and TPB are predominantly used to explain traffic violating behaviour (Lheureux et al. 2015), but these theories are not devoid of criticism. The most significant one is that these theories are not falsifiable (Greve 2001; Ogden 2003; Smedslund 2000; Trafimow 2009; Sniehotta, Presseau, and Araújo-Soares 2014).

Another area where the TPB has been criticized is regarding the predictive validity of the theory. The theory emphasizes rational reasoning, and forgoes aspects such as unconscious influences on behaviour (Sniehotta, Presseau, and Araújo-Soares 2014; Sheeran, Gollwitzer, and Bargh 2013).

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.

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 . They found that traffic violations occurred because of the rider attitude towards that behaviour, prevailing social norms, perceived behavioural control, moral norms (i.e., a subjective norm about a moral rule), 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 study empirically investigated how these four strategies could address 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, whereas they account for 29% in middle-income countries (Naci, Chisholm, and Baker 2009). in India, data shows an increase from 12,300 pedestrian fatalities in 2014 to 20,500 fatalities in 2017 (Dash 2018).

The general attitude towards traffic accidents involving pedestrians is that victims typically 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, wherein drivers in younger age brackets committee

more such errors. 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 tendency to commit traffic violations are determined by the intentions of the individual pedestrian, and not due to subjective norms of the group to which such pedestrians belong. This evidence is consistent with overconfidence and gender differences in overconfidence, specifically studied in the context of road behaviour (Mynttinen et al. 2009) as well as more generally (Dahlbom et al. 2011; Bengtsson, Persson, and Willenhag 2005). These studies also find overconfidence to be more common among novice drivers, females, and younger drivers. Wohleber and Matthews (2016) call this type of overconfidence an "above-average effect" (AAE) and find that it was further correlated with various psychological factors as well as unsafe driving 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 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-maximizing agents, the state functionaries responsible for enforcing law (police, judges, bureaucrats, etc.) are robotic actors without their own ambitions, biases (e.g., gender, caste, religion), and desires.

Basu argues that laws (particularly new laws) are just "ink on paper" and can bring about a change in people's behaviour only in 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. These equilibria are defined as focal points, i.e., those choices of actions that are self-enforcing outcomes -- 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 III.2.

III. 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 et al. (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.

1. 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, 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 *P* conforming 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 and 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 the empirical expectation (a) is fulfilled (necessary condition), and the normative expectation, with or without sanctions [(b) or (c)] is 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* punish a violation of the behaviour.[5]

Acemoglu and Jackson (2014) note that there will be full compliance with a sufficiently large fine or penalty given that other road users can whistle-blow and report violations of rules. This is because when laws are at odds with existing norms, road users anticipate little to no whistle-blowing and therefore are themselves more likely to break the law. In their framework, it is also plausible that whistle-blowing is 'costly' – that is, comes with a private cost to the agent. Consider, for example, a road user wishing to report violations to the police. She will incur the *private* (time) cost of going through the reporting protocol (e.g., driving to a police station, calling them on the phone), but also the *social* cost of potentially receiving sanctions from other road users that consider breaking the law as a norm. See the footnote below for more details on the case of costly whistle-blowing in this context.

Consider the case where road safety is a public good that requires coordination from multiple agents (in this case road users). To be safe, each road user must exert some effort (which 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 the social norm 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[6] and for some S, law violations may not be sanctioned or fined by public enforcement.

In this scenario, road users will try to match the behaviour of other road users, by choosing a behaviour 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 the social norm R in situations of type S conflicts with existing law L.[7] 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.

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 that if they

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[5] 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.

[6] 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).

[7] 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.

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 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 a strong conflict between prevailing social norms and laws can lead to failed regulation. 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. (2020), 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 between one's private values and that of others. For example, one's private values may generally indicate that breaking traffic rules results in negative utility, and one may implicitly understand that others' private values are similar. The private values themselves are composed of *common* values – which are not separately known (in this framework, they are only reflected as a part of private costs). It is useful to think of these common values as existing good or bad norms, that may evolve over time. Given that common values are never fully known to road users (i.e., they are *partially* observed), the private 'shocks' that they face determine these private values, as they are information about whether a particular behaviour is good or bad (in terms of higher or lower common value). For more details, we refer the reader to Smerdon et al. (2020).

In such a setting, the theoretical and experimental results suggest that group size and strength of identity play an important role. Smerdon et al. (2020) 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.

III. 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.[8] 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 adhering to traffic rules can be considered as following *conventions*, "where the preference for conformity does not clash with self-interest." (Bicchieri 2006a, 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; and it is the enforcement of the law – or at least the expectation that it will be enforced – that turn the convention into a social norm.

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[9] to curb traffic violations, it is important to note that misperceptions of norms are widespread (Jeff and Wesley 2005; Bicchieri and Fukui 1999; Bicchieri 2017, 43). 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 and Wesley 2005) to reduce impaired driving among the youth utilized 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 way 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 most individuals do *not* drink and drive (i.e., do not violate the law), the frame motivates others to 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. For example, it is possible that using the minority frame in the case of speeding or traffic rule violation (e.g., driving

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[8] Mixed-motive games are defined as those where players have opposing motivations (or preferences) to choose among all actions available. Some preferences between players may overlap, whereas others may be entirely opposed (Gallo and McClintock 1965). The most common example of this is the prisoner's dilemma game.

[9] 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."

drunk) could have the opposite effect, as it could mistakenly glorify or draw attention to such behaviour (Dosmukhambetova 2020).

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 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 whistleblowing by other road users is also a possible technique for regulation, norms-based interventions often work within the prescribed law L, to ensure that B_i takes a value that is compatible with L, i.e., 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 decide on the basis of payoffs to self and others. One way to test this is to elicit how 'drunk' road users believe that they are (as well as how 'drunk' they believe the acceptable level to be for driving). Indeed, studies have shown that drivers who estimate a lower blood alcohol concentration are also more likely to be riskier drivers (Laude and 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 (e.g., conditions that make complying with rules related to speeding, stopping at red lights seem less risky), 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 (as noted in Dosmukhambetova 2020), the risk of backfiring cannot be ignored (Schultz et al. 2007).

Audiences (such as individuals who subscribe to memberships that permit free alcoholic beverages)[10] 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.

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[10] 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.

Providing feedback to road users is not a new idea in theory (see Evans 1985), and has been tested in diverse contexts. For example, in Canada, pilot interventions that provided feedback on vehicle speed strongly increased compliance with speed limits. Similarly, displaying the average speed at a particular site in New Zealand increased speed limit compliance by up to 13% on average (Wrapson, Harré, and Murrell 2006). In contrast, in a sample of experienced and novice drivers in China, priming individuals with descriptive norms (e.g., a traffic accident is rare at a particular site) raised intentions to commit traffic violations (Xu, Li, and Jiang 2014). Thus, normative feedback interventions that use objective and real-time data could shift norms away from existing bad norms and can be explored as a viable policy initiative in various Indian contexts as well.

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. At the time of writing, there is not much systematic evidence – i.e., beyond the small pilots and experiments discussed above – on the efficacy of such interventions in reducing traffic violations.

V. Conclusions and implications for policy

Our theoretical framework provides a first attempt at characterizing the rule violation prevalent among road users in India. 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 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.

Policies around the world on norms

How have other countries moved toward the norms of lower traffic rule violations and/or smaller road fatalities? Systematic reviews consistently argue for greater enforcement being a major driver of lower violations as well as safer road user behaviour (Greer and Barends 2017; Lefio et al. 2018). However, it is worth examining how the evolution of norms in other countries (even if not strictly in road user behaviour) may inform policy strategy in the Indian context.

As Jayachandran (2020) notes, policy-making that is attuned to norms (in the context of encouraging female labour force participation) can be effective in a variety of contexts. In the UK, for example, priming individuals to be mindful of cyclists (vulnerable road users in urban settings) was meant to help recognize cyclists as fellow road users (Garcia 2008). Given that cyclist deaths have only marginally reduced, it is possible that such mass media campaigns may not serve to shift norms away from inattentional blindness to more consciously looking out for cyclists (Allan 2019).

In contrast, in the United States, the experience with red light cameras has been positive in a variety of cities since 2012 (Insurance Institute for Highway Safety and Highway Loss Data Institute 2021). However, as this report notes, having public support for these enforcement measures is an important aspect of ensuring that the norm of running red lights evolves to an acceptance of stopping at red lights (Mccartt and Eichelberger 2012). Indeed, the support and acceptance of red light cameras dovetails with their reduction of traffic accidents, as more than 87% of residents in one sample reported that red light cameras were needed (Cicchino, Wells, and McCartt 2014). Thus, gauging

perceived norms once enforcement changes (or there are changes in regulations) is an important aspect of understanding whether norms are evolving in the appropriate direction.

Changing social norms is not a particularly easy task for public policy. However, there are several examples in other domains that could inform future work in traffic rule violations and regulating road user behaviour. Starting at the grassroots, using community-based interventions to shift norms in a variety of contexts such as gender-based violence has been particularly effective in developing countries such as Mali, Nigeria, and Nepal (Cislaghi et al. 2019). In order to ensure that norms evolve from bad to good, Cislaghi and Heise (2018) argue that policymakers and civil society organizations must take care to distinguish between norms and attitudes, and gauge norm prevalence, and guard against publicising norms as these may have unintended consequences.

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. As Ahluwalia (2019) notes, larger institutional reforms are needed to enhance urban governance in India, particularly in the space of urban transport and traffic support infrastructure. 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 testing various interventions 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 (Tagat and Rao 2016; Gupta 2018), 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).

References

Acemoglu, Daron, and Matthew O. Jackson. 2014. "Social Norms and the Enforcement of Laws."
        20369. *National Bureau of Economic Research*. https://doi.org/10.1093/jeea/jvw006.

———. 2017. "Social Norms and the Enforcement of Laws." *Journal of the European Economic
        Association* 15 (2): 245–95. https://doi.org/10.1093/jeea/jvw006.

Afif, Zeina, William Wade Islan, Oscar Calvo-Gonzalez, and Abigail Goodnow Dalton. 2019.
        "Behavioral Science Around the World: Profiles of 10 Countries." Washington, D.C.

Agarwala, Ruchika, and Vinod Vasudevan. 2020. "Relationship Between Mobility and Pedestrian
        Traffic Safety in India." *Transportation in Developing Economies* 6 (2): 1–10.
        https://doi.org/10.1007/s40890-020-00103-2.

Ahluwalia, Isher Judge. 2019. "Urban Governance in India." *Journal of Urban Affairs* 41 (1): 83–102.
        https://doi.org/10.1080/07352166.2016.1271614.

Ajzen, Icek. 1991. "The Theory of Planned Behavior." *Organizational Behavior and Human Decision
        Processes* 50 (2): 179–211. https://doi.org/10.1016/0749-5978(91)90020-T.

Akbar, Prottoy A., Victor Couture, Giles Duranton, and Adam Storeygard. 2018. "Mobility and
        Congestion in Urban India." 0829. *Discussion Papers Series, Department of Economics, Tufts
        University*. Discussion Paper Series. https://ideas.repec.org/p/tuf/tuftec/0829.html.

Allan, Cherry. 2019. "Road Casualties 2018: The Vital Statistics for Cycle Campaigning." Cycling UK.
        October 3, 2019. https://www.cyclinguk.org/blog/road-casualties-2018-vital-statistics-cycle-
        campaigning.

Bagai, Rohan. 2011. "India Journal: Jaywalking, It's a Menace...Seriously." *The Wall Street Journal*, May
        4, 2011. https://blogs.wsj.com/indiarealtime/2011/05/04/india-journal-jaywalking-its-a-
        menace...seriously/.

Basu, Kaushik. 2018. *The Republic of Beliefs: A New Approach to Law and Economics*. Princeton, NJ:
        Princeton University Press. https://books.google.com.au/books?id=RBVCDwAAQBAJ.

Bengtsson, Claes, Mats Persson, and Peter Willenhag. 2005. "Gender and Overconfidence." *Economics
        Letters* 86 (2): 199–203. https://doi.org/10.1016/j.econlet.2004.07.012.

Bicchieri, Cristina. 2006a. *The Grammar of Society: The Nature and Dynamics of Social Norms*. New
        York: Cambridge University Press.

———. 2006b. "The Rules We Live By." In *The Grammar of Society: The Nature and Dynamics of
        Social Norms*, 1–10. Cambridge University Press.

———. 2017. *Norms in the Wild*. Oxford University Press.
        https://doi.org/10.1093/acprof:oso/9780190622046.001.0001.

Bicchieri, Cristina, and Yoshitaka Fukui. 1999. "The Great Illusion: Ignorance, Information Cascades,
        and the Persistence of Unpopular Norms." In *Experience, Reality, and Scientific Explanation*,
        edited by M.C. Galavotti and A. Pagnini, 89–121.

Brennan, Geoffrey, Lina Eriksson, Robert E. Goodin, and Nicholas Southwood. 2013. *Explaining
        Norms. Oxford University Press*. https://doi.org/10.1093/acprof:oso/9780199654680.001.0001.

Bureau of Police Research and Development. 2020. "Data on Police Organizations." New Delhi.
        https://bprd.nic.in/WriteReadData/userfiles/file/202101011201011648364DOPO01012020.pd
        f.

Cialdini, Robert B., and Melanie R Trost. 1998. "Social Influence: Social Norms, Conformity and
        Compliance." In *The Handbook of Social Psychology*, edited by D. T. Gilbert, S. T. Fiske, and G.
        Lindzey, 151–92. New York, NY: McGraw Hill. https://psycnet.apa.org/record/1998-07091-021.

Cicchino, Jessica B., Joann K. Wells, and Anne T. McCartt. 2014. "Survey About Pedestrian Safety and

Attitudes Toward Automated Traffic Enforcement in Washington, D.C." *Traffic Injury Prevention* 15 (4): 414–23. https://doi.org/10.1080/15389588.2013.830212.

Cislaghi, Beniamino, Elaine K. Denny, Mady Cissé, Penda Gueye, Binita Shrestha, Prabin Nanicha Shrestha, Gemma Ferguson, Claire Hughes, and Cari Jo Clark. 2019. "Changing Social Norms: The Importance of 'Organized Diffusion' for Scaling Up Community Health Promotion and Women Empowerment Interventions." *Prevention Science* 20 (6): 936–46. https://doi.org/10.1007/s11121-019-00998-3.

Cislaghi, Beniamino, and Lori Heise. 2018. "Theory and Practice of Social Norms Interventions: Eight Common Pitfalls." *Globalization and Health* 14 (1): 1–10. https://doi.org/10.1186/s12992-018-0398-x.

Dahlbom, L., A. Jakobsson, N. Jakobsson, and A. Kotsadam. 2011. "Gender and Overconfidence: Are Girls Really Overconfident?" *Applied Economics Letters* 18 (4): 325–27. https://doi.org/10.1080/13504851003670668.

Dandona, R., G. A. Kumar, M. A. Ameer, G. M. Ahmed, and L. Dandona. 2008. "Incidence and Burden of Road Traffic Injuries in Urban India." *Injury Prevention* 14 (6): 354–59. https://doi.org/10.1136/ip.2008.019620.

Dash, Dipak K. 2018. "Killer Indian Roads Claim Lives of 56 Pedestrians Daily." *The Times of India*, October 1, 2018. https://timesofindia.indiatimes.com/india/killer-indian-roads-claim-lives-of-56-pedestrians-daily/articleshow/66021092.cms.

Dosmukhambetova, Dina. 2020. "The Use of Behavioural Insights in Promoting Residential Energy Efficiency: An Overview of Available Literature." Auckland. https://www.knowledgeauckland.org.nz/media/1912/tr2020-015-behavioural-insights-in-promoting-residential-energy-efficiency.pdf.

Evans, Leonard. 1985. "Human Behavior Feedback and Traffic Safety." *Human Factors: The Journal of the Human Factors and Ergonomics Society* 27 (5): 555–76. https://doi.org/10.1177/001872088502700505.

Fishbein, Martin., and Icek Ajzen. 1975. *Belief, Attitude, Intention, and Behavior : An Introduction to Theory and Research*. Addison-Wesley Pub. Co. https://trid.trb.org/view/1150648.

Fishbein, Martin, Icek Ajzen, and Icek Ajzen. 2011. *Predicting and Changing Behavior*. 1st ed. New York: Psychology Press. https://doi.org/10.4324/9780203838020.

Forward, Sonja E. 2006. "The Intention to Commit Driving Violations - A Qualitative Study." *Transportation Research Part F: Traffic Psychology and Behaviour* 9 (6): 412–26. https://doi.org/10.1016/j.trf.2006.02.003.

Gallo, Philip S., and Charles G. McClintock. 1965. "Cooperative and Competitive Behavior in Mixed-Motive Games." *Journal of Conflict Resolution* 9 (1): 68–78. https://doi.org/10.1177/002200276500900106.

Gandhi, Forum. 2016. "Top Six Traffic Violations Mumbaikars Love to Commit." *Daily News and Analysis*, October 17, 2016. https://www.dnaindia.com/mumbai/report-top-six-traffic-violations-mumbaikars-love-to-commit-2264881.

Garcia, Jane. 2008. "News Analysis: Word of Mouse." *Government News*, 2008. https://search.informit.org/doi/epdf/10.3316/informit.726828663397235.

Garg, Nitin, and Adnan A. Hyder. 2006. "Exploring the Relationship between Development and Road Traffic Injuries: A Case Study from India." *European Journal of Public Health* 16 (5): 487–91. https://doi.org/10.1093/eurpub/ckl031.

Greer, Stuart, and Eric Barends. 2017. "Does Police Traffic Enforcement Result in Safer Roads? A

Critically Appraised Topic." *CEBMA*. Leiden, The Netherlands. https://www.cebma.org/wp-content/uploads/CAT-Stuart-Greer.pdf.

Greve, Werner. 2001. "Traps and Gaps in Action Explanation: Theoretical Problems of a Psychology of Human Action." *Psychological Review* 108 (2): 435–51. https://doi.org/10.1037/0033-295X.108.2.435.

Gupta, Nidhi. 2018. "Where Is the Nudge Unit?" Pragati. 2018. https://www.thinkpragati.com/opinion/3361/where-is-the-nudge-unit/.

Havârneanu, Grigore M., and Corneliu E. Havârneanu. 2012. "When Norms Turn Perverse: Contextual Irrationality vs. Rational Traffic Violations." *Transportation Research Part F: Traffic Psychology and Behaviour* 15 (2): 144–51. https://doi.org/10.1016/j.trf.2011.12.003.

Hindustan Times. 2017. "57% Bikers in 10 Cities Including Mumbai Do Not Wear Helmets: Survey." *The Hindustan Times*, December 18, 2017. https://www.hindustantimes.com/mumbai-news/57-bikers-in-10-cities-including-mumbai-do-not-wear-helmets-survey/story-XQX1cPpzaVpDvf1Y7BRneI.html.

Holman, Andrei C., and Simona A. Popusoi. 2018. "Avoiding Blame When Violating Traffic Rules: The Development and Validation of the Justifications of Traffic Violations Scale." *Psychology, Crime and Law* 0 (0): 1–22. https://doi.org/10.1080/1068316X.2018.1442450.

Insurance Institute for Highway Safety, and Highway Loss Data Institute. 2021. "Red Light Running." HLDI. May 21, 2021. https://www.iihs.org/topics/red-light-running.

Jacobs, G D, and C A Cutting. 1986. "Further Research on Accident Rates in Developing Countries." *Accident Analysis and Prevention* 18 (2): 119–27.

Jayachandran, Seema. 2020. "Social Norms as a Barrier to Women's Employment in Developing Countries." 27449. Working Paper Series. Cambridge, MA. https://doi.org/10.3386/w27449.

Jeff, Linkenbach, and Perkins H Wesley. 2005. "Montana's MOST of Us Don't Drink and Drive Campaign: A Social Norms Strategy to Reduce Impaired Driving Among 21-34-Year-Olds." https://doi.org/DOT HS 809 869.

Joewono, Tri Basuki, Upali Vandebona, and Yusak O. Susilo. 2015. "Behavioural Causes and Categories of Traffic Violations by Motorcyclists in Indonesian Urban Roads." *Journal of Transportation Safety and Security* 7 (2): 174–97. https://doi.org/10.1080/19439962.2014.952467.

Kreindler, Gabriel E. 2018. "The Welfare Effect of Road Congestion Pricing: Experimental Evidence and Equilibrium Implications." Cambridge. http://economics.mit.edu/grad/gek.

Laude, Jennifer R., and Mark T. Fillmore. 2016. "Drivers Who Self-Estimate Lower Blood Alcohol Concentrations Are Riskier Drivers after Drinking." *Psychopharmacology* 233 (8): 1387–94. https://doi.org/10.1007/s00213-016-4233-x.

Lefio, Álvaro, Vivienne C Bachelet, Rosa Jiménez-Paneque, Patricio Gomolán, and Katherinne Rivas. 2018. "A Systematic Review of the Effectiveness of Interventions to Reduce Motor Vehicle Crashes and Their Injuries among the General and Working Populations." *Revista Panamericana de Salud Pública*, 1–8. https://doi.org/10.26633/RPSP.2018.60.

Lheureux, Florent, Jean-Pierre Minary, Laurent Auzoult, Colette Charlois, and Sandrine Hardy-Massard. 2015. "Traffic Offences: Planned or Habitual? Using the Theory of Planned Behaviour and Habit Strength to Explain Frequency and Magnitude of Speeding and Driving under the Influence of Alcohol." *British Journal of Psychology* 107 (1): 52–71. https://doi.org/10.1111/bjop.12122.

Mackie, Gerry, Francesca Moneti, Holly Shakya, and Elaine Denny. 2015. "What Are Social Norms? How Are They Measured?" *UNICEF/UCSD Centre on Global Justice Project Cooperation*

Agreement. http://www.polisci.ucsd.edu/~gmackie/.

Mccartt, Anne T., and Angela H. Eichelberger. 2012. "Attitudes Toward Red Light Camera Enforcement in Cities With Camera Programs." *Traffic Injury Prevention* 13 (1): 14–23. https://doi.org/10.1080/15389588.2011.625745.

Menezes, Naveen. 2017. "Traffic Violation: 91.80 Lakh Cases Booked in 2016." *The Economic Times*, March 29, 2017. https://economictimes.indiatimes.com/news/politics-and-nation/traffic-violation-91-80-lakh-cases-booked-in-2016/articleshow/57888069.cms.

Ministry of Road Transport and Highways. 2017. "Road Accidents in India - 2016." New Delhi, India. http://morth.nic.in/showfile.asp?lid=2904.

———. 2018. "Road Accidents in India - 2017." New Delhi, India. http://morth.nic.in/showfile.asp?lid=3369.

Moyano Díaz, Emilio. 2002. "Theory of Planned Behavior and Pedestrians' Intentions to Violate Traffic Regulations." *Transportation Research Part F: Traffic Psychology and Behaviour* 5 (3): 169–75. https://doi.org/10.1016/S1369-8478(02)00015-3.

Mynttinen, Sami, Anna Sundström, Marita Koivukoski, Kari Hakuli, Esko Keskinen, and Widar Henriksson. 2009. "Are Novice Drivers Overconfident? A Comparison of Self-Assessed and Examiner-Assessed Driver Competences in a Finnish and Swedish Sample." *Transportation Research Part F: Traffic Psychology and Behaviour* 12 (2): 120–30. https://doi.org/10.1016/j.trf.2008.09.002.

Naci, H., D. Chisholm, and T. D. Baker. 2009. "Distribution of Road Traffic Deaths by Road User Group: A Global Comparison." *Injury Prevention* 15 (1): 55–59. https://doi.org/10.1136/ip.2008.018721.

Narayan, V. 2017. "Traffic Violations Fall for 2nd Year in a Row, but Drunk Driving Cases Up." *The Times of India*, January 24, 2017. https://timesofindia.indiatimes.com/city/mumbai/traffic-violations-fall-for-2nd-year-in-a-row-but-drunk-driving-cases-up/articleshow/56747293.cms.

NITI Aayog, and The Boston Consulting Group. 2018. "Transforming India's Mobility: A Perspective." New Delhi, India. http://niti.gov.in/writereaddata/files/document_publication/BCG.pdf.

Ogden, Jane. 2003. "Some Problems with Social Cognition Models: A Pragmatic and Conceptual Analysis." *Health Psychology* 22 (4): 424–28. https://doi.org/10.1037/0278-6133.22.4.424.

Parker, Dianne, Antony S R Manstead, and Stephen G. Stradling. 1995. "Extending the Theory of Planned Behaviour: The Role of Personal Norm." *British Journal of Social Psychology* 34 (2): 127–38. https://doi.org/10.1111/j.2044-8309.1995.tb01053.x.

Press Trust of India. 2018. "Revenue Dept to Focus on Behavioural Patterns of Taxpayers to Improve GST Compliance." Moneycontrol.Com. 2018. https://www.moneycontrol.com/news/business/cbic-to-focus-on-behavioural-patterns-of-taxpayers-to-improve-gst-compliance-3095641.html.

Quium, A S M Abdul, and Thanattaporn Rasamit. 2013. "Recent Progress in Road Safety in the Escap Region." *Transport and Communications Bulletin for Asia and the Pacific*, no. 83: 1–8.

SaveLIFE Foundation. 2017. "Road Safety in India: Public Perception Survey." New Delhi, India. http://savelifefoundation.org/wp-content/uploads/2017/07/Road-Safety-in-India_Public-Perception-Survey_SLF.pdf.

Schelling, Thomas C. 1980. *The Strategy of Conflict.* Harvard University Press. https://books.google.com.au/books/about/The_Strategy_of_Conflict.html?id=7RkL4Z8Yg5AC .

Schultz, P. Wesley, Jessica M. Nolan, Robert B. Cialdini, Noah J. Goldstein, and Vladas Griskevicius. 2007. "The Constructive, Destructive, and Reconstructive Power of Social Norms." *Psychological Science* 18 (5): 429–34. https://doi.org/10.1111/j.1467-9280.2007.01917.x.

Sheeran, Paschal, Peter M. Gollwitzer, and John A. Bargh. 2013. "Nonconscious Processes and Health." *Health Psychology* 32 (5): 460–73. https://doi.org/10.1037/a0029203.

Shinar, David. 2017. *Traffic Safety and Human Behavior. Traffic Safety and Human Behavior.* 2nd ed. Emerald Group Publishing Limited. https://doi.org/10.1108/9781786352217.

Smedslund, Geir. 2000. "A Pragmatic Basis for Judging Models and Theories in Health Psychology: The Axiomatic Method." *Journal of Health Psychology.* SAGE PublicationsLondon, Thousand Oaks and New Delhi. https://doi.org/10.1177/135910530000500202.

Smerdon, David, Theo Offerman, and Uri Gneezy. 2020. "'Everybody's Doing It': On the Persistence of Bad Social Norms." *Experimental Economics* 23 (2): 392–420. https://doi.org/10.1007/s10683-019-09616-z.

Sniehotta, Falko F., Justin Presseau, and Vera Araújo-Soares. 2014. "Time to Retire the Theory of Planned Behaviour." *Health Psychology Review* 8 (1): 1–7. https://doi.org/10.1080/17437199.2013.869710.

Staton, Catherine, Joao Vissoci, Enying Gong, Nicole Toomey, Rebeccah Wafula, Jihad Abdelgadir, Yi Zhou, et al. 2016. "Road Traffic Injury Prevention Initiatives: A Systematic Review and Metasummary of Effectiveness in Low and Middle Income Countries." *PLoS ONE* 11 (1). https://doi.org/10.1371/journal.pone.0144971.

Sundar Committee. 2007. "Report of the Comittee on Road Safety and Traffic Management." http://planningcommission.gov.in/sectors/ppp_report/3.Reports of Committiees & Task force/Power/14.Road_Safety.pdf.

Sunstein, Cass. 1996. "Social Norms and Social Roles." *Columbia Law Review* 96 (4): 903–68.

Tagat, Anirudh, and Sowmya Rao. 2016. "India's Nudge Unit: An Idea Whose Time Has Come." *Livemint*, February 18, 2016. https://www.livemint.com/Opinion/DAzJfdnfgHFOXdKWPI68QM/Indias-nudge-unit-An-idea-whose-time-has-come.html.

Trafimow, David. 2009. "The Theory of Reasoned Action." *Theory & Psychology* 19 (4): 501–18. https://doi.org/10.1177/0959354309336319.

United Nations Office on Drugs and Crime. 2018. "Statistics and Data." UNODC. 2018. https://dataunodc.un.org/.

W Odero, P Garner, and A Zwi. 1997. "Road Traffic Injuries in Developing Countries: A Comprehensive Review of Epidemiological Studies." *Tropical Medicine and International Health* 2 (5): 445–60. https://onlinelibrary.wiley.com/doi/pdf/10.1111/j.1365-3156.1997.tb00167.x.

Wegman, Fred. 2017. "The Future of Road Safety: A Worldwide Perspective." *IATSS Research* 40 (2): 66–71. https://doi.org/10.1016/j.iatssr.2016.05.003.

Wohleber, Ryan W., and Gerald Matthews. 2016. "Multiple Facets of Overconfidence: Implications for Driving Safety." *Transportation Research Part F: Traffic Psychology and Behaviour* 43: 265–78. https://doi.org/10.1016/j.trf.2016.09.011.

World Bank. 2017. "The High Toll of Traffic Injuries: The Macro-Economic And Welfare Benefits of Reducing Road Traffic Injuries in Low & Middle-Income Countries." *World Bank,* License: CC BY 3.0 IGO. https://openknowledge.worldbank.org/bitstream/handle/10986/29129/HighTollofTrafficInjuries.pdf?sequence=5&isAllowed=y.

World Health Organization. 2021. "Estimated Road Traffic Death Rate (per 100 000 Population)." The Global Health Observatory. 2021. https://www.who.int/data/gho/data/indicators/indicator-details/GHO/estimated-road-traffic-death-rate-(per-100-000-population).

Wrapson, Wendy, Niki Harré, and Paul Murrell. 2006. "Reductions in Driver Speed Using Posted Feedback of Speeding Information: Social Comparison or Implied Surveillance?" *Accident Analysis and Prevention* 38 (6): 1119–26. https://doi.org/10.1016/j.aap.2006.04.021.

Xu, Yaoshan, Yongjuan Li, and Li Jiang. 2014. "The Effects of Situational Factors and Impulsiveness on Drivers' Intentions to Violate Traffic Rules: Difference of Driving Experience." *Accident Analysis and Prevention* 62: 54–62. https://doi.org/10.1016/j.aap.2013.09.014.