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Genesis, development and actuality of the Social Representation theory in more than fifty years (1961-2011 and beyond): the main paradigms and the "modelling approach"

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When norms turn perverse: Contextual irrationality vs. rational traffic violations

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ABSTRACT

A perfectly adequate traffic rule can turn "perverse" in situations when it does little to enhance road safety but seems – at least in the drivers' minds – directed primarily at punishing those who violate it. This study examined traffic rule obedience in situations in which the rule was not in accordance with real safety needs. Six rules with major impact on road safety were analyzed: waiting at red traffic lights, legal overtaking, obeying the 50 km/h speed limit, wearing seatbelts, legal stopping/parking, and driving the car in good technical condition. Participants evaluated how adequate these rules are for safety. Then they were faced with six scenarios, that made each of these rules appear irrational, and were asked to report their potential engagement in deviant behavior. The survey data were collected in a sample of 605 drivers. Multiple regression analyses showed that in most situations rule violation depended on the usual deviant behavior, perceived irrationality of the rule, little respect for the law and low risk perception. These factors best explained the 50 km/h speed limit violation. The results suggest that the lack of situational risk factors, which makes the rule look meaningless, is important determinant of rule violation. Implications for massive disobedience and road safety are discussed.

1. Introduction

According to the World Health Organization (2009), Romania has the second highest number of severe road accidents per capita in Europe. In 2009, Romania registered 130 fatalities per million inhabitants, being the first country in the EU. In 2010, only in the first 10 months, there have been more than 7000 severe crashes, leading to over 1700 deaths and 6400 injuries (European Commission, 2010). In other words, Romania's fatality rate is 1/3 meaning that one out of three accidents that occur is fatal, while the EU mean ratio is 1/40 (CNADNR, 2010).[1]

According to police authorities, deadly accidents occur because of the road users' indiscipline, the speeds much over the limits, illegal overtaking, drunk driving, and illegal crossing. To deal with this problem, policy makers and governmental authorities focused mainly on law enforcement strategies and less on education or technology. Since 2002 the Romanian Traffic Code has been changed three times, each time making the laws stricter and introducing more severe punishments. For example, the 60 km/h speed limit within rural areas was reduced to 50 km/h, the fines increased, and penalty points were introduced. In addition, the traffic police have obtained better and better radar technology with huge improvements

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[1] The acronym stands for *the National Company of Motorways and National Roads in Romania*. Its main purpose is the highway and road administration. CNADNR is member of the International Road Federation (IRF).

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in detection range. Despite the changes in the Traffic Code and the enhanced enforcement of the laws by police, the deviance rate is still high and traffic casualties have not decreased.

2. Normative and anti-normative behavior

Traffic psychologists use the phrase *aberrant driving* behavior to explain general deviance from safe practices and recurrent violations (for reviews see Parker, West, Stradling, & Manstead, 1995; Lawton, Parker, Manstead, & Stradling, 1997; Lawton, Parker, Stradling, & Manstead, 1997, Åberg & Rimmo, 1998). Tyler (1990) argued that people's compliance with the law is regulated either by normative motives – which result from the internalization of the norms – or by instrumental motives related to the perceived gains and losses (e.g. accident risk, police fines). From the latter point of view, compliance is initiated by a desire to avoid punishment or to receive positive rewards. Castellà and Pérez (2004) showed for example that drivers with low sensitivity to punishment and high sensitivity to reward are more likely to break the law.

These conceptualizations reveal a basic explanation for the high rate of deviance in traffic: While some road users respect the rules as a result of the internalization process (thus considering the norms adequate), others obey the law just because they want to avoid sanctions. According to Åberg (1998), the rules in traffic differ with respect to their social acceptance in the population, something that might be related to the influence of social factors, like social norms and attitudes. Parker, Lajunen, and Stradling (1998) suggested that violations of any kind are intentional, although some violations are carried out so regularly by some drivers that they become habitual. To this moment, there is also some empirical proof for this assumption. Schechtman, Shinar, and Compton (1999) investigated the relationship between drinking habits and safe driving behaviors and found that those drivers who drink frequently are more likely to drink and drive in the future.

However, Rothengatter (2002) argued that the application of social theories occurs in isolation, that is to say, out of environmental context. For example, predictions based on the theory of planned behavior (Ajzen, 1985) determine the intention to perform a specific behavior at the exclusion of other variables, such as biographical and environmental factors. In addition, Elliott, McColl, and Kennedy (2003) argued that speed choice is affected by road characteristics such as width, surface, markings, curvature or number of carriage lanes.

3. The rule adequacy to the driving context

Traffic rules consist of general statements which forbid or prescribe specific behaviors. Some rules are shaped though "regulatory devices" (e.g. traffic signs, signals, pavement markings, etc.) which instruct or direct road users (Lay, 2004). From an applied perspective their goal is to enhance traffic safety and facilitate preventive behaviors as well as maximum performance in the driving task. The design and application of the traffic rules are based on objective criteria. For example, overtaking prohibition areas are based on measured visibility of the road ahead; speed limits are based on the road conditions and studies about driving speeds and risk, etc.

From the users' perspective, however, the rules are not always regarded as such. Several studies support that rule obedience depends on the subjective perception of the rules. For example, Kanellaidis, Golias, and Zarifopoulos (1995) concluded that the most important reason for speeding violations is that drivers do not always consider posted speed limits to be realistic. In other words, drivers perceive the speed limit as inadequate for the situation. Yagil (1998) also noted that perceiving the law as illogical, old-fashioned or redundant contributes to accepting the deviance from the laws as more moral. Björklund (2005) found that drivers' behavior varies substantially over situations, especially when a specific norm leaves some room for ambiguity. When activating an informal rule, drivers tend to rely more on their own judgements about appropriate behavior and sometimes a process of negotiation emerges between road users (Björklund & Åberg, 2005). Similarly, Goldenbeld & van Schlagen (2007) noted that drivers perceive the 80 km/h posted speed limit as inappropriate for a given road section, depending on characteristics of the road environment, and characteristics concerning the field of view. They conclude that drivers ignore the limit and form their own decision as to what speed is appropriate, depending on the context.

Fernández-Dols and Oceja Fernández (1994) observed that speed limits are systematically violated by more than just a small group of drivers, involving about 90% of them. Such a massive violation led them to call these types of traffic rules *perverse*, as they exist more for infringement rather for obedience. The *perverse norm* is defined as an explicit social norm which involves sanctions but which is not obeyed by most of the group members (Fernández-Dols, 1993). Pérez, Lucas, Dasi, and Quiamzade (2002), and Lucas and Pérez (2003) used this term to explain the massive disobedience towards the Traffic Code, not only towards speeding. They argue that police practices encourage the perception of rules as something arbitrary, because compliance with the law depends to a great extent on police immediacy. Thus, drivers will comply with a "perverse" rule only because of authority pressure.

4. Perceived irrationality of rules and strategic violations

From a strict social perspective the aim of the rules is to make road users' behavior predictable for one another and to organize the driver interactions (Pérez et al., 2002). Priority rules are good example for this. These rules are perfectly rational and increase safety, because without them traffic would be chaotic and crashes would occur in intersections. However, they are relevant only if several road users interact in the same driving context. A less educated driver who arrives in an empty

crossing may perceive the red traffic light as inadequate for that situation (because there is no risk of collision with anyone) and may decide to drive forward. Similarly, pedestrians who see no proximal vehicles may cross the street while the light is red, because waiting may feel time-wasting. The social psychology literature suggests that social norms can truly differ with respect to their level of credibility, effectiveness, or rationality. For example, Cialdini, Reno, and Kallgren (1990) and Cialdini, Kallgren, and Reno (1991) argue that people focus mainly on the descriptive norms, specifically on those rules which are the most effective or adaptive for the normative situation. Therefore, such deviant behaviors may actually represent contextual adaptations to the rule's perceived irrationality.

While the problem of inadequate rules is a serious issue for the road users, it is also related to the infrastructure. There are situations when the environment does not remind the drivers of the potential risks. Speed limits, for example, may be perceived as too low on poor infrastructures. If there are few motorways, most roads will cross though small towns and villages where the speed limits are 50 km/h. Based on objective criteria, having lower speed limits on one lane roads and inhabited areas is extremely rational and safe. However, in such conditions longer journeys are difficult and tiring because road travel is slowed down both by the restrictions and by trucks, tractors, agricultural machinery, carriages, or bicycles.

In these circumstances, consider the driver who decides to cross a village at more than 50 km/h on clear weather and only if there are no obstacles on the road. This driver is aware of the rule and may obey it in other circumstances (e.g. in rainy conditions). When judging this situation, the driver is likely to first include the subjective risk estimate, which is the output of a cognitive process (Fuller, 2005). If the driver perceives a low level of risk (or even no risk) the rule loses its contextual rationality. Thus, the behavior is illegal, yet subjectively safe for the driver because the whole traffic situation gives a false feeling of safety. Moreover, in such a situation the first perceived danger is being detected and sanctioned by the police.

These assumptions are partially supported by two of our pilot studies. The first one suggests that drivers perceive specific rules from the Romanian Traffic Code as unadjusted for real safety needs. One of the most inadequate rules is the 50 km/h speed limit in urban and rural areas. In addition, Romanian male drivers have negative attitude towards the traffic police and report mainly negative experiences with this authority (Havârneanu & Goliţă, 2010). The latter study also suggests that drivers obey the rules mostly because of the fear of punishment and not because of safety.

Therefore, in this paper we address the issue of rule contextualization and explore how drivers adapt their normative behavior in situations that make the traffic rule apparently lose its rationality. We call these situations *perverse* as the rule appears to do little to enhance road safety but seems – at least in the driver's mind – directed primarily at punishing those who violate it. Specifically, a traffic rule turns perverse if the driver perceives it as inadequate for the current situation, and fears no real danger but only being sanctioned by the police. We propose this double-sided effect of the traffic laws (rational in some situations, meaningless in other situations) may facilitate the violation of the rules mainly by the uninformed and biased drivers. Our hypothesis is that the driver's reaction to "perverse" rules is based on the impression that the norm is irrational, on the low level of perceived risk, the low social conformism, and the habitual deviant behavior.

5. Method

5.1. Participants and sampling

Six-hundred and five Romanian drivers (291 men and 314 women) participated in this study. Their age ranged from 20 to 67 (M = 43.51; SD = 9.44), and their total mileage ranged from 7000 km to 2,000,000 km (mean mileage 155394.96 km; SD = 163035.63). All participants had a driving license and regularly drove a car. The sample included people of the general public, with different occupations and levels of education. The participants were individually contacted by research field operators who asked them to fill in a questionnaire; the questionnaire was directly submitted to each participant. In the end they were asked to indicate their age, gender and total mileage. Each field operator had to cover a minimal number of participants for each main category of the population according to gender (male, female), age (young, adult, old), and total mileage (less experienced, very experienced).

5.2. Measures

5.2.1. Perceived irrationality of traffic rules

Six items measured the degree in which drivers perceived the traffic rules as being indeed adjusted to the real traffic security needs. Each item referred to a different rule and consisted of short affirmative sentence extracted from the national Traffic Code (e.g. *The speed limit within urban and rural areas is* 50 km/h). Participants had to rate each rule in terms of adjustment to real traffic safety needs on a 6-point Likert type scale from 1 = *perfectly adjusted* to 6 = *not at all adjusted*. The evaluations were analyzed both globally (total score; Cronbach's α = .73) and separately for each rule. Higher scores reflected low rationality.

5.2.2. Usual deviant behavior

Participants' self-reported deviant behavior in traffic was assessed using a 12-item questionnaire, adapted after the 14-item version used by Lev, Hershkovitz, and Yechiam (2008). The items presented some frequent violations of traffic rules (e.g. *exceeding the speed limit in the city*) and the respondents were asked to report how often they displayed this behavior in

the last year using a 6-point Likert type scale from 1 = *never* to 6 = *extremely often*. A total score was computed (α = .89), a high score suggesting the habitual tendency towards deviant behavior in traffic.

5.2.3. Social order acceptance

Four items assessed the attitude towards social order (e.g. *State institutions are rationally organized and very well functioning*). Participants responded on a 7-point Likert scale, from 1 = *totally disagree* to 7 = *totally agree*, a high score reflecting the acceptance of authority pressure (α = .50).

5.2.4. Respect for the law

Other four items (α = .47) used the same 7-points scale to measure the general respect for the law (e.g. *The law might be harsh but it must be obeyed because it is a law*). The social order acceptance and the respect for the law were both assumed to measure social conformism.

5.2.5. Perceived traffic risk

Perceived traffic risk was measured using a short version of the scale constructed by Rosenbloom, Shahar, Elharar, and Danino (2008). We selected eight items referring only to those rules of particular interest for this study. Each item presented a somehow risky situation (e.g. *driving at 60 km/h in the city, running through a yellow traffic light*, etc.). Participants were asked to rate how dangerous each situation was, using a 6-point Likert type scale from 1 = *not at all dangerous* to 6 = *extremely dangerous*. A total score was computed (α = .71); high scores indicated a higher risk associated with these situations.

5.2.6. The behavior in perverse traffic situations

Six scenarios were created in order to contextualize the set of rules which have initially been evaluated from a general perspective (see the Appendix). All scenarios were textual with an average length of 55 words. This type of measure is similar to the technique used by Forward (2009). The purpose of the scenarios was to make each rule appear as less adequate for the situation, in other words not adapted for real safety needs, and consequently to increase the driver's temptation to violate it. Moreover, the scenarios presented commonly encountered situations for the Romanian drivers. Participants had to read each scenario and decide how often they would engage in deviant behavior, using a 6-point Likert type scale from 1 = *never* to 6 = *always*. A total score was computed (α = .67), a higher score indicating a higher probability to violate the rules in situations when they appear to be less rational.

5.3. Checking the appropriateness of the scenarios

Both the alpha-coefficient (above .60) and the inter-correlations between the responses to the scenarios (see Table 1) suggested a consistent tendency to break the laws over the situations. In addition, we checked if the six scenarios actually included non-risky situations in which the rule was not in accordance with real safety needs. This was tested on a separate sample of 32 ordinary drivers with the same demographic characteristics as the main sample. They were asked to rate the level of risk in each situation on a scale ranging from 1 (*very high*) to 7 (*very low*). Table 2 shows the descriptive statistics for each scenario. All the means are above the midpoint of the scale supporting the absence of situational risk. We used the one-sample *t* test to compare the means with the theoretical value of 4; the significant differences are flagged accordingly. Overall, this procedure reveals that most drivers actually perceive a low level of risk in these traffic situations. The only questionable scenario is the one concerning the seatbelt.

6. Results

Given that we used several variables in order to build multiple prediction models, we first conducted a covariance analysis between all the variables analyzed. Table 3 summarizes the zero-order intercorrelations between the variables. The age-mileage correlation was positive and significant showing a correct association between the two, with older drivers being more experienced than young drivers. However, the total mileage did not correlate with the criterion (i.e. the deviant

Table 1
Spearman correlations between the reported deviant behavior in the six scenarios (N = 605).

	Situation 1 (red lights)	Situation 2 (overtaking)	Situation 3 (over-speeding)	Situation 4 (seatbelt use)	Situation 5 (stopping/parking)
Situation 2 (overtaking)	.108**				
Situation 3 (over-speeding)	.272**	.476**			
Situation 4 (seatbelt use)	.201**	.128**	.320**		
Situation 5 (stopping/parking)	.271**	.200**	.457**	.235**	
Situation 6 (technical condition)	.333**	.098*	.320**	.255**	.307**

* $p < 0.05$.
** $p < 0.01$.

Table 2
Descriptive statistics revealing the perceived level of risk in each situation ($N = 32$).

	M	SD	Median	Mode
1. Red lights	5.50**	2.01	6.50	7.00
2. Overtaking	5.78**	1.77	6.50	7.00
3. Over-speeding	5.34**	1.35	6.00	4.00
4. Seatbelt use	4.34	1.91	4.00	4.00
5. Stopping/parking	5.40**	1.45	6.00	6.00
6. Technical condition	4.84*	1.95	5.00	7.00

* $p < 0.05$.
** $p < 0.01$.

Table 3
The zero-order correlation coefficients between the variables.

	Usual deviant behavior	Social order acceptance	Respect for the law	Risk perception	Total mileage	Age	Deviant behavior in perverse situations
Perceived irrationality of the rules	.446**	.045	−.265**	−.238**	−.064	−.074	.420**
Usual deviant behavior		−.008	−.314**	−.296**	−.060	−.212**	.591**
Social order acceptance			.047	.105**	−.011	.049	−.025
Respect for the law				.134**	.084*	.140**	−.350**
Risk perception					.066	.140**	−.302**
Total mileage						.291**	−.045
Age							−.198**

* $p < 0.05$.
** $p < 0.01$.

behavior in perverse situations); therefore it was not retained for further analysis. Similarly, the social order acceptance was excluded from the predictors list because it did not correlate with the criterion and had a low alpha coefficient. In spite of the low reliability, the general respect for the law was kept in the regression analyses because it correlated with the criterion. The irrationality of the rules strongly correlated with the usual deviant behavior (.44), as well as the deviant behavior in perverse situations (.42). Moreover, the rule irrationality was in negative correlation with the perceived risk, suggesting that low subjective risk is associated with high irrationality of the rule.

6.1. The general prediction model of deviant behavior

We predicted the deviant behavior in perverse situations from a general point of view, meaning that we did not yet focus on any particular rule. Thus, the total scores for all variables were used in the analysis. A multiple stepwise linear regression was conducted introducing the following independent measures: perceived irrationality of the traffic rules, usual deviant behavior, respect for the law, risk perception, and age. The dependent measure was the total score for the behavior in the six perverse situations.

Four regression models were extracted. The constant variable in all models was the usual deviant behavior. In the first model this measure correlated positively with the predicted deviant behavior, explaining alone 34% of the total variance (Adjusted $R^2 = 0.34$). The fourth model was significantly better than the previous ones (Adjusted $R^2 = 0.412$, $F_{1,596} = 11.85$, $p < 0.001$), explaining almost 42% of the total variance. It included all the predictors entered in the analysis with the exception of age (see Table 4). The perceived irrationality of the rules positively correlated with the predicted deviant behavior, accounting for 3.2% of its variance. Respect for the law and risk perception negatively correlated with the criterion, significantly improving the model.

These results suggest that the drivers who usually deviate from the traffic rules, who perceive the rules as inadequate for safety, who have a low respect for the laws and a low level of subjective risk are more likely to violate the rules in situations that make the rule appear meaningless.

6.2. Predicting deviant behavior in each specific situation

We further tested how the model applies for each of the six scenarios. We examined which situation is best explained by the prediction model, and for which situation the irrationality of the rule plays an important role. We conducted six more stepwise regression analyses (one for each scenario). However, for the irrationality of the rule we did not use the total score but each time the item referring to the perceived irrationality of the rule in question. Table 5 displays the results of this analysis, showing the best model for each situation.

Globally, the six models fit the general one. The usual deviant behavior is constantly the best predictor in all six situations, covering between 6% and 30% of the criterion's variance. The irrationality of the rule is usually the second best predictor,

Table 4
Explaining the general deviant behavior in contexts where the rules lack rationality; results of the final regression model.

	B	Std. error	Beta	R^2 change	*t*
Usual deviant behavior	0.24	.020	0.43	.349	11.80**
Perceived irrationality of the rules	0.20	.044	0.16	.032	4.53**
Respect for the law	−0.20	.042	−0.16	.023	−4.73**
Risk perception	−0.11	.031	−0.11	.012	−3.44**

** $p < 0.01$.

Table 5
Explaining the deviant behavior in six specific contexts where the rules lack rationality; results of the best regression model obtained for each situation.

Norm (Adj. R^2)	Predictors	*B*	Std. error	Beta	R^2 change	*t*
Running through the red traffic lights (0.108)	Usual deviant behavior	0.03	.006	0.21	.064	4.92**
	Irrationality of the red traffic lights	0.38	.100	0.15	.029	3.77**
	Respect for the law	−0.05	.014	−0.13	.014	−3.19**
	Risk perception	0.02	.010	0.08	.007	2.09*
Illegal overtaking (0.141)	Usual deviant behavior	0.04	.007	0.23	.095	5.63**
	Risk perception	−0.06	.012	−0.20	.040	−5.03**
	Age	−0.02	.007	−0.10	.010	−2.63**
Violating the 50 km/h speed limit (0.371)	Usual deviant behavior	0.06	.006	0.40	.302	10.60**
	Risk perception	−0.04	.009	−0.16	.033	−4.49**
	Irrationality of speed limits	0.16	.037	0.16	.022	4.47**
	Age	−0.02	.005	−0.10	.011	−2.94**
	Respect for the law	−0.04	.012	−0.10	.009	−2.90**
Not using the seatbelt (0.166)	Usual deviant behavior	0.04	.007	0.23	.118	5.56**
	Irrationality of seatbelt use	0.26	.055	0.19	.035	4.71**
	Respect for the law	−0.01	.015	−0.14	.017	−3.44**
Illegal stopping or parking (0.213)	Usual deviant behavior	0.04	.006	0.29	.163	7.11**
	Irrationality of legal stopping/parking	0.16	.043	0.14	.024	3.72**
	Respect for the law	−0.04	.012	−0.13	.016	−3.38**
	Risk perception	−0.03	.009	−0.13	.014	−3.30**
Driving the car in questionable technical condition (0.139)	Usual deviant behavior	0.03	.004	0.25	.110	6.12**
	Respect for the law	−0.04	.010	−0.15	.025	−3.72**
	Irrationality of periodic technical inspection	0.12	.050	0.10	.008	2.40*

* $p < 0.05$.
** $p < 0.01$.

though it is irrelevant for illegal overtaking. Similarly, respect for the law and risk perception improve the prediction models in most cases. Age plays an important role only in two out of six scenarios, particularly for overtaking and speeding. In both cases it negatively correlates with the deviant behavior, suggesting that in less rational circumstances, young drivers are more likely to engage in such behaviors compared to older drivers.

Overall, the six prediction models are not very powerful. Most models explain between 10% and 21% of the variance. The weakest model (only 10% of the variance explained) is for waiting at the red traffic lights despite there is no traffic. On the other hand, the best and most complex model is by far the one predicting speeding behavior (37% total variance explained). Some interesting explanations can arise for these findings.

7. Discussion

The results are consistent with the other studies on the perceived adequacy of traffic rules, providing support for the concept of *perverse norm* (Fernández-Dols, 1993). One conclusion is that obedience also depends on the perception of the rule as adequate to the traffic situation. Preliminary correlation analysis revealed that low subjective risk is associated with high irrationality of the rule. In other words, if the driver perceives no real danger the rule will be considered inadequate for real safety needs, thus irrational in that situation. The global regression analysis showed that drivers have a strong tendency to engage in deviant behavior when in perverse situations, mainly according to their usual deviant behavior, irrationality of the rule, general disrespect for the laws and low level of perceived risk.

The usual deviant behavior is the core component of the general model and the only constant powerful predictor in all six scenarios. This indicates that the deviance in perverse situations depends on the driver's general tendency to disregard traffic

rules. The perceived irrationality of the rules significantly improves the model, suggesting that violations occur also because the rules are perceived as inadequate for real safety needs. Likewise, general disrespect for the law and little risk associated with the violation facilitate deviance.

The six prediction models followed the pattern of the general model but were weaker, covering between 10% and 37% of the variance. These different percentages can be explained thorough the strong fear of the police control and the severity of the violation. For example the weakest model is for waiting at the red traffic light in the middle of the night despite there is no traffic. Running against the red lights means breaking a very serious priority rule and is severely punished. In addition, it is less common violation for the drivers as it is for pedestrians. Driving violations at the traffic lights usually involve running through the yellow lights. In addition, most cities would switch off the traffic lights during night time. In contrast, the other violations are less severely punished. Driving without the seatbelt fastened, stopping and parking the car in illegal places or driving the vehicle without the valid technical certificate involve paying a fine and receiving some temporary penalty points. Therefore, when these norms turn perverse, the temptation to violate them is stronger maybe because the fear of punishment is weaker.

The best prediction model is by far the one for over-speeding suggesting that speed limits may easily be perceived as "perverse". In Romania, the sanctions for exceeding the speed limit with less than 50 km/h are still not very harsh. Therefore, many drivers break the limits with less than 50 km/h, eventually affording to pay for their violation. Our results are consistent with speeding being best predicted by self-report measures compared to other types of violations (see Haglund & Åberg, 2000; Åberg, Larsen, Glad, & Beilinson, 1997). According to our model, drivers frequently exceed the 50 km/h speed limit and frankly report this violation. This behavior mostly supports the "rule perversity" hypothesis: drivers are used to exceeding this speed limit because they do not perceive any real risks and consider the restriction as inadequate for safety.

It is worth particular note that two deviant behaviors are also explained by the driver's age. Younger drivers are more likely to illegally pass slower vehicles and over-speed in inhabited areas when the traffic situation appears to be safe. In both situations lower age is accompanied by lower risk perception and higher usual deviance. On the other hand, risk perception is not a relevant predictor for two out of six behaviors, particularly for driving in the city without a seatbelt, and for leaving on a longer journey without the mandatory technical inspection of the car. These findings show that the explanation for deviant behavior is not always the absence of risk *per se*, but the lack of rationality in complying with the rule.

A noteworthy limit of this study arises from the self-reported data and the possible desirability tendency in responses. Second, the number of norms which have been tested is relatively small, whereas other rules may also turn perverse in specific traffic situations. Third, the proposed perverse situations might not be the best ones; for example the scenario concerning the seatbelt may have failed in making the rule appear irrational. Other scenarios could include pictures with real traffic scenes in order to confront participants with more clear traffic situations. Further research should also study the amount of mismatch between objective risk in the situations described and drivers' estimated risk and the related reactions. It would be useful to see the actual motives behind behavior, thus having the participants motivate their decision for each situation. Much more useful would be to design different types of scenarios (e.g. high relevance for safety, high relevance for being punished, irrelevant) to see how drivers perceive and react in these conditions. Yet, when studying the massive deviance from the traffic laws, psychologists should consider the importance of the subjective evaluation of rule rationality, along with the cognitive risk estimation and other social variables as usual driving behavior and general respect for the law.

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Appendix A

The six scenarios used to measure the deviant behavior in perverse traffic situations.

Situation #1

You are driving in the city late at night and arrive at a junction. The traffic lights are red. You stop and realize that no other road user is currently in the intersection. In this situation, how often do you decide to drive though the intersection?

Situation #2

On a day with very good visibility, you are driving your car on a two-lane road (one lane in each direction). The lanes are separated by a continuous line and you have to pass a carriage, taking into account that there is no vehicle coming from the opposite direction. In this situation, how often do you decide to overtake the carriage?

Situation #3

You are driving though a village where the speed limit is 50 km/h. The road is perfectly straight and there is not a single obstacle which may limit your visibility. You don't see other road users. In this situation, how often do you drive faster, breaking the speed limit?

Situation #4

You need to do some shopping. The supermarket you want to go to is situated close to the edge of the city, at about 15 min of normal driving. You are about to drive though urban and quite heavy traffic. In this situation, how often do you fasten your seatbelt?

Situation #5

You have been driving in the city; you are now on a boulevard very close to your destination and you need to park the car for about 15–20 min. The only parking place in the area is completely full. There is no zebra crossing and no intersection around. You could park your vehicle on the first lane leaving other two lanes free for the traffic, but you see the road sign which forbids you to stop the car in that area. In this situation, how often do you park the car there?

Situation #6

Your car's periodic technical inspection expired a week ago. You did not have the time to take the car to a service for a new technical check and for the validation of the technical certificate. Today you should leave on a longer journey (approximatively 1000 km). In this situation, how often do you decide to leave on the journey?

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