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Review Article

Managing conditional speed.

A preliminary research among police motorcyclists

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Abstract: Powered two-wheelers (PTWs) are considered one of the riskiest means of transport, and their riders belong to the category of vulnerable road users. Police motorcyclists are at greater risk because they ride a motorcycle in the context of a risky professional activity. In the field of social psychology, the theory of conditionality studies the relationship between legal norms and social norms, demonstrating the importance of the latter which are conditional, legitimate in the representation and reflecting "calculated risk-taking". Although the conditionality of motorcyclists has been already studied, there is no published data on police motorcyclists who represent a specific group. This preliminary research analyzes the behavior of 25 California Highway Patrol motorcyclists. They completed a Conditional Scripts Questionnaire (CSQ) based on a speed scenario and 25 circumstantial situations. The results illustrate the management of conditionality among law enforcement. The analysis shows the importance of conditional transgressions in the professional context. On the other hand, weak conditionality in unsafe driving-contexts highlights that police motorcyclists cope proactively with risky situations.

Keywords: Traffic psychology; theory of conditionality; police motorcyclists; occupational road risks; management of risks; California.

1. Introduction

Motorcycle accidents account for a disproportionately high number of fatalities compared with their number in total traffic. In 2021, 5,932 motorcyclists were killed, representing only 3.5 percent of all registered vehicles in the United States.[1] This significant disparity highlights the increased risks motorcyclists face on the road.

Similar to drivers, speeding is crucial in fatal motorcyclist accidents on the road network.[2;3] But riders of two-wheelers have a significantly higher death risk than drivers of cars[4;5], because they are part of the category of "vulnerable road users[1]". Studies in the field of professional road risks primarily focus on motorists and drivers of buses, heavy vehicles, and other similar vehicles. The problem of exposure to risk is a complex problem because it integrates characteristics linked to the individual but also to the work environment. People who drive for work are more exposed to risks and they tend to adopt riskier driving behaviors than other drivers.[6] For many types of transport users[7;8] travel is a source of stress (whether driving personally or taking public transport), and some professions require driving in emergency situations.[9] The case of law enforcement is specific. According to Trautmann (2014[10]), risky decision-making under stress is typical of police officers. There exist several psychosocial risk factors among police officers, such as job stress.[11;12;13;14] Police officers do a job involving exposure to threats and violence at work, which constitutes a health risk factor.[15;16] A study[17] indicates that 88% of police officers have suffered psychological aggression, and 61% have suffered physical violence in one year. According to the "Los Angeles Airport Peace Officers Association"[18] violence against police officers increases: "The increase in ambush-style attacks against law enforcement is deplorable and underscores just how dangerous it is to be an officer…" Although we do not find specific data on motorcycle police officers, it is considered that the risk is constant when officers ride a motorcycle in the exercise of their duties.[19]

The theory of Conditionality[20;21] results from research on normative and peripheral aspects of social representations. This theory, which highlights that social prescriptions are conditional, served as a framework for several studies in the field of traffic psychology.[22;23] This work shows that two systems coexist: the Highway Code, which is the system of legal norms, and the "real practices," which form the system of social norms. The more debatable a rule is, the less respected it is. A conditional situation is called a 'legitimate transgression' because it is considered acceptable in people's minds, even if it technically constitutes a transgression of the Highway Code. It is important to precise that the aim of this orientation "is not to identify the groups which commit violations nor the types of drivers which are potentially dangerous but to study the representation of driving using a normative approach" (p. 355).[20]

The conditionality is measured with a specific tool, the Conditional Scripts Questionnaire (CSQ), whose construction aims to attenuate social desirability, as explained by the author. [22] This tool is based on scenario(s) and conditional situations, and it was used for studying different groups such as motorists, pedestrians, motorcyclists and more recently, horse riders.[24] Passing on this tool among motorists (young and elderly) shows that respecting the speed limit is the most conditional scenario, in comparison with the others (red light, yellow light, stop sign, continuous line, no entry, seat belt). Speed conditionality is formed by a set of "good reasons" justifying not to respect it (e.g., infrastructures, type of vehicle, being alone or not, time pressures, the aim of the journey, distraction, etc.). This conditionality can evolve. For example, in 2007, the conditionality of the red light was greater than that of the one-way street, the continuous white line, and the stop sign. [20] Since the installation of red-light cameras, there is less conditionality in this scenario, while conditionality increased with the continuous white line.[23] Drivers' conditional respect for pedestrians was illustrated

[1] for, Organisation. 1998. "Safety of Vulnerable Road Users." Bts.gov. Organisation for Economic Co-operation and Development. August 7, 1998. https://rosap.ntl.bts.gov/view/dot/34110.

using Bayesian networks (BN). Results showed that this conditional respect depended on the attitudes of the pedestrians and that female drivers are more empathetic.[25]
The conditionality of the rule regarding speeding among motorcyclists shows that all situations are conditional, even those that overexpose them to hazards (e.g., bad weather conditions, riding on a winding road, riding at night). Furthermore, the study comparing conditionality according to the types of motorcycle and horsepower shows that riders of sports motorcycles and roadsters are more conditional, like riders with a more powerful motorcycle.[26] Although the conditionality of motorcyclists is known, there is no published data on that of police motorcyclists. This group is specific because motorcycle police officers exercise a risky profession, drive a motorcycle, and represent the law. It, therefore, seems interesting to combine conditionality and professional road risks among law enforcement motorcyclists. One can think that police motorcyclists will take fewer risks outside of priority and or emergency missions; thus, they would engage in self-regulation behavior.

Following this theoretical approach, the following hypotheses are put forward:

H1: All situations will be conditional.

H2: Police motorcyclists will be more conditional during priority and/or emergency missions (e.g., suspect to be arrested; accident etc.).

H3: Outside of these contexts, police motorcyclists will be less conditional when situations are perceived as unsafe.

H3-1: Police motorcyclists will be less conditional when they feel affected by health conditions (e.g. fatigue, stress, etc.)

H3-2: Police motorcyclists will be less conditional when driving conditions are unsafe (e.g. infrastructure, distraction, etc.).

2. Method

2.1. Context: The California Highway Patrol (CHP)

The California Highway Patrol (CHP) was established on August 14, 1929, and is the primary police agency in the State of California[2]. The CHP has primary patrol jurisdiction over all California highways and roads outside city limits and may exercise its law enforcement powers anywhere in the state. Currently, there are approximately 11,000 officers, including 300 motorcyclists, for the entire state of California. In 1929, all CHP officers were motorcyclists and rode Harley Davidsons[3]. Today, CHP motorcyclists ride BMW R1250 RTs. Given their work environment, motorcycle officers are at a higher risk of injury. However, there is no distinction in overall statistics (specific data for motorcycle officers is not available). In 2022, a total of 11,985 police pursuits were reported to the CHP. Of these, a total of 2,275 (19.0%) pursuits resulted in a crash. Of the reported crashes, 1,445 (63.5%) were property damage-only crashes, 798 (35.1%) were injury crashes, and 32 (1.4%) were fatal crashes, which resulted in 34 deaths (no law enforcement officer deaths).[27]

2.2. Motorcyclists

For this preliminary study, we collected responses from 25 California Highway Patrol motorcyclists.

2.3. Tool: The questionnaire

First part.

[2] "California Highway Patrol Protective Services Division History and Development." n.d. https://www.theiacp.org/sites/default/files/all/c/CapPolice_CalifoniaHighwayPatrol.pdf.
[3] Fleming, Rob. 2011. "Harley Davidson and the Police Motorcycle." Russ Brown Motorcycle Attorneys®. November 11, 2011. https://russbrown.com/harley-davidson-and-the-police-motorcycle/.

The beginning of the questionnaire included an ethical section informing the participants of the main objective of the study, guaranteeing confidentiality and anonymity, and confirming the liberty to withdraw at any moment of the study. All participants signed free and informed consent. The first part of the questionnaire allowed us to collect sociodemographic data: age, motorcycle license years, type of motorcycle used at work, number of accidents at work, explanations of accidents, level of study, sports practice habits, and family situation.

Second part.
A Conditional Scripts Questionnaire (CSQ) was built following the initial method.[20] This questionnaire is based on a speed scenario ("As a motorcyclist police, you sometimes exceed the speed limit by at least 10 mph if …"), and 25 circumstantial psychosocial situations. These situations have been taken from the original questionnaire (e.g. "there is nobody on the road"; "you are distracted"; "you ride on a winding road")[20;26] or have been adapted to this specific professional group (e.g. "you must arrest a suspect"; "you have to go to an accident"). The 25 conditional situations were evaluated on an ordinal scale graduated in 6 levels starting with unconditional observance (absolutely never transgress) through to unconditional transgression (transgress all the time).[20]
A google form questionnaire was created online with a QR code and transmitted to the motorcyclists of the CHP.

2.4. Analysis strategies

The usual method of quartile analysis was used. Cronbach's alpha will be calculated for the speed scenario.Quartile analysis divides a dataset into four equal parts. The third quartile (Q3 or the 75th percentile) is the value that separates the top 25% of the data from the rest. In other words, 75% of the data falls below this point. The higher this value, the more conditional the situation is. The average score was also calculated; the smaller the average score for a given situation, the less conditional the situation is.
Circumstantial psychosocial situations will be grouped according to the level of conditionality:
-High (3rd quartile = 5 and 6)
-Low (3rd quartile = 1 and 2)
-Intermediate (3rd quartile=3 and 4)

3. Results

3.1. First part of the questionnaire

The average age of motorcyclists is 42.24 years, with a standard deviation of 8.71. The majority of the group is experienced, having obtained their motorcycle license more than 15 years ago (52%), or between 8 and 15 years (32%); 16% are less experienced (between 3 and 7 years). Eighteen motorcyclists say they have had 1 or more motorcycle accidents at work (72%) and 7 say they have never had one (28%). Among motorcyclists who had an accident:
-2 declare having had one or more material accidents for which they were responsible.
-11 declare having had one or more material accidents for which they were not responsible (third party's fault).
-3 declare having had one or more serious accidents for which they were not responsible.
-2 declare having had several material and serious accidents for which they were not responsible.
For the level of education, the majority (64%) declared having a high school Diploma (N=16), 7 a bachelor's degree (28%) and 2 a master's degree (8%). For motorcycles, most (N=16) ride a BMW (64%), 7 ride a Harley Davidson (28%), and two motorcyclists did not provide the information. They all say they practice sports, although 13 (52%) do not do so regularly. Most (N=16) say they are married or in a civil partnership with children (64%), five are single (20%) and four are divorced (16%).

3.2. Results of the CSQ

The Cronbach alpha shows good reliability (0.948). We observe in the results that 11 situations have a high conditionality (44%, table 1), nine situations are weakly conditional (36%, table 2) and five situations have an intermediate level of conditionality (20%, table 3).

Table 1: "...As a motocyclist police, you sometimes exceed the speed limit...if". Mean scores and third quartile of the most conditional situations ($Q_{75\%}$ = 5 and 6)

High conditionality	Mean scores[4]	$Q_{75\%}$
there is nobody on the road	4.880 [2-6]	6
you know the road well	4.960 [2-6]	6
you must arrest a suspect	4.920 [2-6]	6
you are in pair (with your colleague)	4.120 [1-6]	5
the sky is clear, and the road is dry	5.120 [2-6]	6
you have to go to an accident	4.480 [2-6]	5
you are in trust	4.680 [2-6]	5.75
you are in an Escort situation (e.g. the Governor)	4.680 [2-6]	5
drive at speed is for you a pleasure	5.120 [2-6]	6
you don't ride the usual motorcycle	3.960 [1-6]	5
you are on a straight road	5.120 [2-6]	6

Table 2: Mean scores and third quartile of the least conditional situations ($Q_{75\%}$ = 2)

Weak conditionality	Mean scores	$Q_{75\%}$
you are riding on a winding road	2.160 [1-5]	2.75
you feel tired	1.960 [1-5]	2
if it's the end of your shift, you're going home	1.880 [1-5]	2
you are stressed	1.720 [1-5]	2
it's nighttime	1.880 [1-5]	2
your hierarchy asked you	2.080 [1-5]	2.75
the road is in poor condition	1.880 [1-5]	2
weather conditions are bad	2.040 [1-6]	2
you feel pressure	1.840 [1-6]	2.75

Table 3: Mean scores and third quartile of the intermediate conditional situations ($Q_{75\%}$= 3 and 4)

Intermediate conditionality	Mean scores	$Q_{75\%}$
you are distracted	2.360 [1-4]	3
you consider it hazardous to ride more slowly	2.760 [1-6]	3
you begin your service	2.760 [1-5]	4
you are in radio communication	2.640 [1-6]	3.75
you consider the limit of speed is too low	3.240 [1-6]	4.75

[4] Minimum and maximum values are in square brackets.

4. Discussion

Motorcyclists are vulnerable road users, and motorcycle crashes are a common cause of mortality in the world.[28] Speeding is one of the most common factors in motorcycle accidents. [3;29;30] Research in different countries helps us to understand the attitudes and behaviors underlying accidents. [31;32;33] The group of motorcycle police officers is specific since he combines the status of vulnerable road users while exercising a risky profession.[15;16;17] The present research is rooted in the theory of conditionality developed in social psychology to study rules of conditionality and the relationship between legal norms and social norms. This conditionality or "legitimate transgression" is defined as "calculated risk-taking."[20;21] Although the conditionality of motorcyclists has been studied, there is no published data on motorcycle police officers.

The first hypothesis, which states that all situations in the speed scenario are conditional, is confirmed. Indeed, we see in the responses that no situation results in absolute respect for the rule ("absolutely never" [1]). A study based on laboratory measurements showed that motorcyclists chose higher speeds than car drivers. [34]

The second hypothesis assumed that police motorcyclists would be more conditional during priority and/or emergency missions. The results confirm this hypothesis because the situations: "you must arrest a suspect," "you have to go to an accident," and "you are in an Escort situation" are among the most conditional; this illustrates increased risk-taking in the professional context. Previous studies show that the simple fact of going to work justifies not respecting speed limits among motorists and among motorcyclists.[20;26]

In addition to these results, high conditionality is observed in other circumstances. Even if the size of the sample of civilian motorcyclists studied is not comparable (more than 600 motorcyclists [26]), it is possible to put some results in parallel. Civilian motorcyclists are in the same third quartile ($Q_{75\%}$=5) "if there is nobody on the road" and "if they know the road well". Police motorcyclists are also more conditional if the sky is clear and the road is dry, if they are on a straight road and if they ride for pleasure; for these 3 situations, police motorcyclists have a 3rd quartile at 6 and civilian motorcyclists have a 3rd quartile at 5. It is known that perceived good driving conditions (infrastructure, weather) and knowledge of the road justify speeding among motorists and motorcyclists. The two other very conditional situations : the pleasure of speed and self-confidence, are based on psychological mechanisms. In the field of social representations, a study highlights that for motorcyclists, the notions of pleasure and freedom are central [35]; even if the risks on a motorbike are significant, the pleasure of driving outweighs the risks. The other aspect that concerns self-confidence is also part of the risk factors established in accidents, whether it is the overestimation of driving skills or what is called "comparative optimism".[36;37 ; 38]

The 3rd hypothesis is more original and is also verified. It was assumed that police motorcyclists, as safety professionals, might engage in self-regulation behavior. This would lead to a reduction in conditionality in situations considered unsafe. The first sub-hypothesis was that police motorcyclists would be less conditional when experiencing signs of physical or mental fatigue. According to the Insurance Information Institute[39], asleep, fatigued, and drowsy drivers are part of the 2.1 percent of fatal car crashes in 2022. Some defend the fact that it is the mental load rather than the driving itself that is the cause of fatigue. [40] Risky decision-making under stress is typical of police officers[10]; thus, this profession is exposed to health risk factors.[13;41] The results show that police motorcyclists are less conditional when they are aware of their weaknesses. When they feel tired and stressed, the 3rd quartile is 2 and when they feel under pressure, the 3rd quartile is 2.75. The second sub-hypothesis was that police motorcyclists would be less conditional if the driving conditions were unsafe (e.g., infrastructure, distraction, etc.). This sub-hypothesis is confirmed. For civilian motorcyclists, conditionality is higher in certain contexts: bad weather (Q75%=3, versus 2 for police motorcyclists), driving on a winding road (Q75%=5, versus 2.75 for police motorcyclists), driving at night (Q75%=4,

versus 2 for police motorcyclists). By being less conditional, police motorcyclists adopt preventive behavior, since night riding is more dangerous (due to reduced visibility), and riding on a winding road or in bad weather can accentuate the loss of control of the motorcycle, the main factor in accidents among motorcyclists.[42] Another example of this preventive behavior is the low conditionality during commuting (if it's the end of your shift, you go home). The data highlight that commuting remains one of the deadliest times on American roads.[43] Note that police motorcyclists are more conditional on the outbound trip than on the return trip (Q75%=4, versus 2). On distraction, the evidence is more mixed, with conditionality scores intermediate but still lower than those of civilian motorcyclists (Q75%=4, versus 3 for police motorcyclists). It is important to note the professional justification of police motorcyclists: you are on a radio call (Q75%=3.75). According to the NHTSA, "distracted driving contributed to 3,522 deaths in 2021." [44]. Finally, it is relevant to note the relationship to the rule, which translates into a personalized assessment.[20] For civilian motorcyclists, conditionality is higher when they consider it dangerous to drive slower (Q75%=5, versus 3 for police motorcyclists), and when they consider the speed limit to be too low (Q75%=6, versus 4.75 for police motorcyclists). Thus, police motorcyclists are overexposed to risks through their work and, by driving the motorcycle, cope proactively with risky situations.
Although this preliminary study provides an illustration of speed management among police officers on motorcycles, the sample is limited. To strengthen these results, it will be necessary to collect a larger sample. Certain sociodemographic variables could have an impact on conditionality and clarify the role of some protective factors.

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