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The struggle to overcome traffic congestion: A study of social interaction and effects on deviant behavior of motorcycle riders

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ABSTRACT

Background: Motorcycle riding as a means of daily transportation in Southeast Asia, especially Jakarta, Indonesia, manifests the struggle to use the road. This struggle - associated with congestion, irregularity, and lack of control - can lead to physical harm or material loss. Studies on deviant behavior related to motorcycle use mainly discuss motorcycle gangs and traffic violations. This paper intends to explicate how the context of this struggle informs the different meanings of the deviant behavior of motorcyclists in daily traffic life. It employs concepts of innovation and ritualism, learning, harm, visuality, and secret deviance to shatter the prevailing understanding of motorcyclist traffic behavior. **Methods:** This study chooses T.B. Simatupang Street, one of the busiest roads in Jakarta, as a research location. A mixed method is used to examine the context of the struggle, first qualitatively by utilizing visual data collected through (a) direct video recordings on the road and (b) aerial drone video recordings. Both recordings captured images of motorcyclist behavior considered deviant and can cause harm, such as stopping illegally, clamoring while cutting lanes and other vehicles, and slipping between two automobiles. Then quantitatively, it conducts a survey to collect data on motorcyclists' experiences. Included in the survey were questions with images captured from the direct video recording footage to collect responses toward motorcyclist riding behavior. **Findings:** The survey findings show that responses toward images of motorcyclist behavior—concerning harm—show a lack of understanding of driving safety and traffic rules, and some consider it as just the daily routine of motorcyclists. **Conclusion:** Therefore, the visuality of motorcyclist traffic violation is learned through innovation (driving recklessly) or ritualism (daily habit) as a struggle that is ironically visibly secretly upheld by fellow motorcyclists. **Novelty/Originality of this Study:** This study offers a novel perspective by framing motorcyclists' behavior in Jakarta's traffic as a form of adaptive struggle rather than mere deviance or rule breaking. It uniquely utilizes visual criminology to argue that what is often seen as traffic violations may be better understood as contextual adaptations to urban congestion, thereby challenging prevailing interpretations of motorcyclist behavior.

KEYWORDS: visual criminology; motorcyclist behavior; traffic congestion; social harm.

1. Introduction

Motorcycle riding as a means of daily transportation in Southeast Asia, especially Jakarta, Indonesia, manifests the struggle to use the road. This struggle - associated with congestion, irregularity, and lack of control - can lead to physical harm or material loss. In this region, a motorcycle is used as a daily transportation activity (OECD, 2015; Cheng et al.,

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2015; Susilo et al., 2015; Yasin, et al., 2022). The reason is that motorcycles are more affordable than four-wheeled vehicles, their shape only requires little space, and they also cost less than four-wheeled vehicles (Haworth, 2012; Susilo et al., 2015; Kitamura et al., 2018). Therefore, motorcycles have continuously increased faster and more extensively than other vehicles (Haworth, 2012). So motorcycles are the primary choice for travel or simply for connecting when commuting in the Jakarta area (Tjahjono et al., 2020).

Motorcyclists in Jakarta are not only those who drive their vehicles to travel (Maulana and Yudhistira, 2020) but also many people who use motorcycles as a means of working (ojek or motor-taxi) (Saffan and Rizki, 2018). Motorcycles occupied the highest position in the categorization of transportation facilities in Jakarta in 2021, reaching 75.39% or as many as 16,519,197 units of the total number of vehicles recorded (BPS, 2022). The high rate of motorcycle use has increased since the first decade of the 21st century (Putranto and Anjaya, 2014). The sheer number of motorcycles makes the roads during traffic jams in Jakarta look like a sea of motorcycles (The Jakarta Post, 2014), and to experience them requires a certain calmness.

Road traffic is supposed to be a continuous flow of vehicles, but when there are blockages, those vehicles become congested (Kerner, 2009). The massive presence of private vehicles, especially motorcycles, occupying the roadway is the main factor contributing to congestion formation (Istianto et al., 2019). Some have argued that road congestion is a condition of entropy due to traffic chaos (Davis, 2023; Cabral et al., 2013; González-Pérez, 2018) and even causes conflicts between vehicles or between drivers (Gayer, 2016; Hydén, 2016). Traffic chaos is either a "deviant" social process related to public safety or a reflection of social entropy (Mitar, 2010). Traffic chaos also means neglecting the meaning and proper use of the roadway as a cultural object, or in other words, cultural entropy has occurred (McDonnell, 2016).

A roadway is a cultural object because it is a space for a movement that shows beauty, uniqueness, danger, and damage (Merriman, 2007). However, as Downs (2000) stated, another cause of congestion in some developing countries is the apparent disregard for the rules by many drivers, including driving on sidewalks, moving too close to other vehicles, changing direction without signaling, and cutting the flow. Meanwhile, according to Susilo et al. (2015), motorcyclist behavior that is considered deviant includes disregarding traffic regulations and bad driving habits, such as overtaking other vehicles on the wrong side and pushing the motorcycle through a (very) narrow gap. Moreover, Gayer (2016) wrote that driving will at least always be related to speed, an arena of conflict influenced by brutal acceleration and momentary deceleration, which can be considered chaotic moments. While the previous arguments are useful, this paper focuses on different aspects. It intends to explicate how the context of this struggle informs the different meanings of the deviant behavior of motorcyclists in daily traffic life.

Atkinson (2014) says it is a circular argument to declare something wrong simply because it is forbidden or illegal. He says that how crime and deviance are perceived depends on the social context, with various customs and norms applied to those with power differentials. Thompson and Gibbs (2016) argue that there is no universal standard of normative behavior and, thus, no rigid definition of deviance or obedience, as norms are socially constructed directives that advocate appropriate behavior in particular social situations. In other words, according to Thompson and Gibbs (2016), norms are relative to culture, time, place, and situations and are likely to differ in how various parties interpret them.

This relationship between congestion and accidents has led to some motorcyclists' behaviors being categorized as violations of applicable traffic rules and social deviants. However, by scrutinizing the visuality of road infrastructures, means of traffic control, and the high number of vehicles on the road space, this study argues that the visuality of motorcyclist driving behavior, especially during traffic jams, is a form of struggle. Hence, motorcyclists consider such struggles—that manifest as a violation of traffic rules and social harm events—not as violations and harmful acts.

1.1 Literature review and guiding concepts

Studies on deviant behavior related to motorcycle use mainly discuss motorcycle gangs and traffic violations. Many scholars view reckless or risky motorcycle riding as a dangerous behavior and even a violation of traffic rules (Johnson, 1991; Cheng et al., 2015; Ospina-Mateus et al., 2019; Yasin et al., 2022), and there is even a view that being a motorcyclist is a perversion (Thompson, 2012; Thompson and Thompson, 2014). Such a view is because motorcycle use, especially in developed countries, tends to be more associated with leisure or recreational use rather than as part of everyday transportation (Thompson and Thompson, 2014). Another similar view is motorcycle users as part of a gang that tends to be involved in organized crime (Watson, 1980; Quinn, 2001; Quinn and Koch, 2003; Lauchs, 2019, 2020; Roks and Densley, 2020; Blokland et al., 2020; Bradley, 2022; van Deuren et al., 2022), as well as the appearance of the riders (Thompson, 2008; Quinn and Forsyth, 2009) or other behaviors seen attached to those motorcycle riders (Quinn, 1987).

In order to explore the contextual and different meanings of deviant behavior, this study employs several concepts, such as innovation and ritualism, learning, harm, visuality, and secret deviance, to shatter the prevailing understanding of motorcyclist traffic behavior. Indeed, obeying or not obeying the rules is a form of social adaptation to the situations and conditions encountered (Tierney, 2006; Vito and Maahs, 2015), and this can also be shown by two-wheeled motorized vehicle drivers with their agility when driving. At least two modes of adaptation proposed by Merton in 1938, Innovation and Ritualism, can be seen in the context of riding motorcycles on the roadway. Innovation is when the way motorcyclists in traffic act is not as many others act and is even unacceptable to others. At the same time, ritualism is when the motorcyclists behave following the conditions created, such as going with the flow during a traffic jam, which hampers the speed of the driver's journey.

Driving a vehicle is a learned behavior, including learning some traffic rules and regulations violations. According to Sutherland, violations of rules and regulations, like other behaviors, can be learned, and such learning may materialize through verbal interactions and gestures (Sutherland and Cressey, 1978). Furthermore, Sutherland also said that violating behavior has variations in the frequency and duration of the manifestation of its form and the priority to do or not (Sutherland and Cressey, 1978). For instance, disregarding the priority to yield between a motorcycle and other vehicles may result in a damaged vehicle, physical injury, or even death (de Craen et al., 2014), which constitutes harm.

As for harm, Pemberton (2015) and Canning and Tombs (2021) have created several typologies. Physical harm is the most straightforward form of harm to observe in the context of motorcycle use. Because motorcycle use also contributes to the death rate from traffic accidents. According to the WHO report in 2015, the death rate from traffic accidents involving two-wheeled and three-wheeled vehicles reached 36% and increased sharply to 74% in 2018 (WHO, 2015, 2018). Pemberton (2015) says that personal transportation is an expression of freedom and autonomy in capitalist societies, but it comes at a high cost when people prefer this form of transportation. When motorcycles have exceeded the presence of other types of vehicles, a culture has emerged concerning motorcyclist behavior.

Regarding harm and culture, Canning and Tombs (2021) put forward a category of cultural harms, a development of relational harms expressed by Pemberton in 2015. Canning and Tombs (2021) also utilized Boukli and Copson's thinking in 2020 and aspects of Alvesalo's thinking regarding cultural safety in 1994. Boukli and Copson (cited by Canning and Tombs, 2021) revealed that cultural harm includes harm by culture and misrecognition. According to Canning and Tombs (2021), "harms of recognition" are when individuals experience the impact of misrepresenting their existence by existing social processes, especially those seen as deviants.

According to Brown (2017), visuality is the distinction, separation, and aesthetics of behavior, and in this article, the visuality of traffic jams and motorcyclists' behaviors that occur in those traffic jams. Because scrutinizing traffic jams and motorcyclists' behavior is

"the right to look." Furthermore, "the right to look" is closely related to "the right to be seen or visible" instead of disappearing (Brown, 2017). However, scrutinizing traffic jams and motorcyclists' behavior based only on traffic rules and regulations will only facilitate "seeing and not seeing" practices that make people, injuries, and control visible and invisible (Brown, 2017). There is also the concept of secret deviance, which Becker (1963) wrote: "...Here an improper act is committed, yet no one notices it or reacts to it as a violation of the rules..." Therefore, when motorcyclists commit violations during traffic jams, other motorists know but do not react or pay attention because they are doing the same thing.

1.2 Visual methodology and its application in studying deviant behavior

This paper relies on visual criminology, which discusses and explains deviance using visualization through photos and videos (Brown and Carrabine, 2017; Wheeldon, 2021; McClanahan, 2021). A study of deviance that utilizes visual methods in a video (Pauwels in Brown and Carrabine, 2017), for example, is research by Redmon (2018) in the form of videos related to crimes, offenses, and injuries/harms. He used the term "video ethnography paper" to review and describe the documentary film he made.

Another study by Lindegaard et al. (2018) utilized CCTV video footage of several shop robbery incidents, and the Dutch national police owned the footage. Then, the study of Suonperä Liebst et al. (2020), which also uses visual data in the form of police CCTV video recordings in the city of Copenhagen related to aggressive behavior in the nightlife area. Then, Friis and Lindegaard (2021) used video recording data of fines imposed by public transportation ticket inspectors in Copenhagen. Parry et al. (2021) offer the application of a multi-stage procedure to validate subjects' perceptual statements based on videos of interactions between police and community members. A study that comes (slightly) closer in that it addresses the issue of driving and conducts an analysis based on visual material is that of Feinberg et al. (2014), who examined car advertising videos that normalize and glamorize reckless driving behavior.

2. Methods

This study used a mixed method to examine the context of the struggle. The first stage is qualitative, utilizing visual data collected through (a) direct video recordings on the road and (b) aerial drone video recordings. We approached the issue qualitatively using visual methods to gain *verstehen* about the right to be seen of the motorcyclists in their struggle to cope with urban traffic. Direct video recordings were meant to record traffic situations and conditions at the driver's or street level of vision, while drone recordings were intended to record bird's eye view levels.

There were five steps we undertook for visual methods. These steps were derived and modified from Pauwels's integrated conceptual framework (Pauwels, 2011; Nassauer and Legewie, 2019, 2021) video data analysis method. Step 1 is orienting based on secondary data. In this step, images of traffic visualization were taken from Google Maps. We copied the scene representing hourly traffic from 06.00-22.00 for each day of the week. For each day, 17 images were collected, and for the whole week, 119 images. Using Adobe Photoshop, all images were overlayed one on top of the other by adjusting their transparency level. The base layer is an image with a time stamp of Monday 06.00. The overlayed images were then merged into one image. This image is used to select roadways to be video recorded. Another process of overlaying and merging is done for every image with the same time stamp. These images were compared for choosing the time for video recording. Based on the overlay results, the Jalan TB Simatupang - RA Kartini section in the southern part of Jakarta was selected for the observation and video recording location.

Step 2 researcher-produced video recording helmet mounted and handheld camera. Video recording is conducted twice a day, first starting at 07.00 and estimated to conclude at 09.00 in the morning. The second started at 18.00 and concluded at 20.00 in the late afternoon. All recordings were carried out on January 13 and 15, 2020. For recording, two

GoPro cameras and two motorcycles were used. One camera was attached to the rider's helmet of the first motorcycle. The passenger of the other motorcycle held another camera. We employed six people for this, with three-person teams for each recording day. All six must have a motorcycle driving license for at least five years. The helmet-mounted camera recorded the traffic situation based on a typical driver's point of view. In contrast, the second camera attempted to record other situations around the two vehicles during the trip. Both motorcycles traveled approximately 22 km of roadways. Both teams recorded approximately 9 hours of video in 46 files with an average of 11 minutes duration and a size of 2 GB. The helmet recordings are approximately 4 hours of videos in 27 files.

Step 3 Another researcher-produced video recording using a drone. Based on the helmet-mounted and handheld camera recordings, there are several road intersections along the route. We deliberately choose three main intersections. Unfortunately, the drone camera could not record in one intersection because of signal interference. The type of drone used was DJI Phantom 4, the camera focus used a standard 20mm, and the battery capacity for one observation was 15 minutes. The first intersection is an intersection that does not have traffic light settings, while the second intersection is a signalized intersection. The drone makes recordings at 50-75 meters above the ground. The videos were recorded twice, both in the morning and afternoon.

After three recording steps, step 4 was categorizing and coding recorded videos. Coding was the first author's responsibility. We only chose to code video from a helmet-mounted camera because the recording from the handheld camera was designated as a triangulation point. The recordings from the drone cameras were categorized and coded manually, which is also the responsibility of the first author. Coding for the helmet-mounted video recording was done using Maxqda 2020 software. The codes that were used are listed in the Table 1.

Table 1. List of codes and their reference sources

Codes	Reference sources
Location (road design):	Walton and Buchanan, 2012; Vlahogianni et al.,
Intersection	2012; Suardika et al., 2013
Non-intersection	
Traffic or road signs, markings, and signals	Vlahogianni et al., 2012; Suardika et al., 2013
Presence of a traffic controller	Chang et al., 2019
Riding behavior	Ragot-Court et al., 2012; Susilo et al., 2015;
Cutting lane	Walton and Buchanan, 2012; Vlahogianni et al.,
Counterflow/ against direction	2012; Suardika et al., 2013; Ram and Chand,
Slipping between 4-wheel vehicle	2016; Manan et al., 2017; Chang et al., 2019
Violating traffic signals	
Unsignalized movement	
Helmet use	
Riding behavior: Stop-in-place	Sulistyono et al., 2018
Traffic flow	Vlahogianni et al., 2012; Chang et al., 2019
Harm	Pemberton, 2015; Canning and Tombs, 2021
Injury	
Losses	

The form or shape of the roadways, such as T intersection, indicated location or road design codes. Codes of traffic or road signs, markings, and signals were indicated by either being easily visible, obstructed, or damaged. The existence of traffic police or regular police indicated the presence of a traffic controller. Indicators of driving behavior codes are as those behaviors appear in the footage, which includes when a motorcyclist is seen stop-in-place during traffic. Indicators for traffic flow were given as either smooth or congested. Codes for harm were differentiated between probable injuries, such as not wearing a helmet, and probable losses, such as cutting lanes. Both codes of injury or losses are often simultaneously assigned.

Additional codes were given to visible and interpretable situations and conditions, such as children as passengers, passengers without helmets, and overcapacity. Other additional

codes are for authorized or unauthorized parties that are seen controlling traffic. The details of the codes can be found in the codebook in the appendix of this article.

The last step of the visual method is selecting captured images. In this step, the recordings from both GoPro cameras and the drones were sorted and manually selected based on the above codes. By playing all recorded videos using VLC software, several images are captured and then edited using Microsoft Paint 3D software. Ten images captured from GoPro recordings were selected for the questionnaire.

In the second stage, questionnaires were used to survey motorcyclists' experiences (Table 2). Respondents were also asked to respond to motorcyclist riding behavior displayed on the selected captured images. The survey was conducted online via the Google Forms platform. Purposely targeted respondents with criteria age between 17-64 years, live in the greater Jakarta area, which included cities of Bekasi, Tangerang, Southern Tangerang, Depok, and Bogor, and use motorcycles a minimum once a week either as motorcyclists or passengers. The questionnaire was divided into seven sections (A through G).

Table 2. Overview of the questionnaire

Sections	Question	Number of questions
A	General description	5
B	Driving background: Driving experience and driving learning history	4
C	Driving activity between 2019 to 2021	3
D	Experience while driving: Accidents and traffic enforcement	4
E	Driving attitudes: The way of seeing and helmet use	8
F	Knowledge and experience of traffic devices and controllers: Signs, marking, signals, police, etc.	6
G	The visuality of riding a motorcycle	20

Questions with selected captured images were in Section G. A brief description of the captured images embedded in the questionnaire is that eight images show the scene in the morning and two at night. Seven images show traffic congestion mainly by motorcycles; two images show traffic congestion on particular sides and directions, and one image shows two lanes of roads with different densities. Six images show road locations that are not intersections, one of which is a bridge, and four images show road locations that are intersections. Five images show motorcyclists overtaking other road users. Three images show drivers and passengers not wearing helmets, including one child passenger. Two images show motorcyclists using the sidewalk. Two other images showed a motorcyclist slipping between two four-wheelers. Finally, two images show motorcyclists going against the direction of the traffic.

3. Results and Discussion

3.1 Visual findings

The helmet recording shows that intersection and non-intersection roads are visible within the observation site. The recording also shows that road signs, marks, and traffic are generally visible, although some are obstructed and damaged. Regarding the flow of traffic, the helmet recording manages to capture both smooth-moving traffic and congested traffic. Both helmet and drone recordings captured scenes of motorcyclist behavior that are considered deviant and can cause harm, such as stopping illegally, clamoring while cutting lanes and other vehicles, and slipping between two automobiles.

The visuality of stopping (VS) has intersected 2123 times with other codes. The visuality of cutting lanes or changing lanes on the same lane (VOCL) intersected with other codes 2027 times. Furthermore, the visuality of lane splitting (VLSTF) intersected around 1515 times with other codes. Another group of visuality that intersect between 500-1000 times is the visuality of deviance relating to passengers (VDP), the visuality of a rider not wearing a helmet (VHU), the visuality of carrying goods (VCC), and the visuality of going

against the direction (VWWD). Visuality groups that intersect less than 500 times are visuality of changing lanes from different lanes (VML), violating traffic signal lights (VRLV), riding motorcycles on sidewalks (VRS), and blinker signaling (VBS) (Table 3).

Table 3. Visuality groupings and its acronyms

The visuality of stopping: Drop-off passengers did not use blinkers to stop or stop out of place	VS
The visuality of overtaking or changing lanes	VOCL
The visuality of lane splitting (Threading or filtering)	VLSTF
The visuality of deviance relating to passengers: Not using helmets, child passengers, and over-capacity	VDP
The visuality of helmet uses (Driver only)	VHU
The visuality of carrying cargo: Too large, too many and endangering others	VCC
The visuality of wrong way (Against traffic) driving	VWWD
The visuality of merging lanes	VML
The visuality of red light violations	VRLV
The visuality of riding on the sidewalk	VRS
The visuality of blinker signal: To maneuver or to stop	VBS

In order to discuss congestion as entropy, we examine the intersections between the visuality groups and "the road location" code group (intersection and non-intersection), the "vehicle flow condition" code group (smooth and congested), the "presence of signs, markings, and traffic signals" code group (visible, obstructed and damaged) and the "traffic regulator" code group (traffic police and other parties seen regulating traffic). The VS group intersects mainly with code road location non-intersection at 353 times. In comparison, the VOCL group mainly intersects with code road location intersections 147 times. This group also intersects 289 times with code-congested road flow. The VS group, on the other hand, intersected with the smooth road flow condition code only 259 times.

Concerning the visibility of road signs and markings, the VS group intersected 139 times and 63 times, respectively. On the other hand, the VOCL group intersects with the visibility of traffic signals about 54 times. For the visibility of traffic controllers, the VOCL group intersects not with the traffic police code but with the code of the transportation department or pamong praja police . However, compared to the other visuality groups, the VOCL group also relatively intersects mainly with the traffic police code.

A finding concerning the intersection between visuality groups and harm codes shows that The VOCL group broadly intersects with harm codes as losses, which amounted to 266 times. As for the VS group, it intersects with harm coded as an injury 229 times. The VLSTF group intersects almost equally to harm as an injury code and harm as a loss code, 157 times and 152 times, respectively.

The drone footage corroborates the visibility of motorcyclists squeezing between four-wheeled vehicles, as it was captured at two observation points and occurred during a traffic buildup. At one of the observation points, the footage showed motorcyclists stopping out of place and moving in the direction of changing lanes (appendix images A1.1-A1.2). There was also slipping between two four-wheelers, which can cause losses and even injuries (appendix images A2.1-A2.2).

3.2 Survey findings

The survey findings show that responses toward images of motorcyclist behavior—concerning harm—show a lack of understanding of driving safety and traffic rules, and some consider it as just the daily habits of motorcyclists. Table 4 shows a general description of the findings from the survey. Concerning visibility, 77.8% of respondents admitted that they often look ahead and at the mirrors, not only when turning, changing direction, or preceding other vehicles. The helmets used were generally (67.5%) half-face and were used every time they rode a motorcycle (63.9%). Regarding helmet use, 95% of respondents have no problems with visibility. Furthermore, 50.3% of respondents as

drivers (both motorcycles and cars) stated that traffic signs are easy to see, and 70.4% stated that traffic signs are easy to understand.

Table 4. Respondents general description (N= 338)

Classification		N	%
Sex	Male	272	80.5
	Female	66	19.5
Age	Under 18 years	7	2.1
	18 - 27 years	123	36.4
	28 - 36 years	68	20.1
	37 - 45 years	95	28.1
	46 - 54 years	39	11.5
	Above 54 years	6	1.8
Residency	Bandung	2	0.6
	Bekasi	26	7.7
	Bogor	42	12.4
	Depok	77	22.8
	DKI Jakarta	146	43.2
	Jawa Barat	1	0.3
	Kalimantan Tengah	1	0.3
	Karawang	1	0.3
	Madiun	1	0.3
	Malang	1	0.3
	Sukabumi	4	1.2
	Tangerang	9	2.7
	Tangerang Selatan	26	7.7
	Tasikmalaya	1	0.3
Work place/ School/ College	Bekasi	14	4.1
	Bogor	35	10.4
	Depok	55	16.3
	DKI Jakarta	212	62.7
	Tangerang	8	2.4
	Tangerang Selatan	14	4.1
Ability to drive	Car	21	6.2
	Motorcycle	126	37.3
	Both	191	56.5
Driver license	For car only	34	10.1
	For motorcycle only	129	38.2
	Both	175	51.8

For the ability to see. notice. and obey traffic signals and road markings, 77.2% of respondents stated that traffic signals are easy to see, notice, and obey, while 62.3% stated the same for traffic markings. Regarding the visibility of traffic controllers, 96.2% of respondents have seen traffic police, and at least within a week before filling out the questionnaire, 74.2% of respondents often see traffic police.

With the visibility of traffic police, one form of traffic control is the issuance of tickets. This ticketing occurs in two situations, namely during traffic enforcement operations and daily traffic enforcement. More respondents admitted that they had never experienced a traffic ticket, either during a police operation or in their daily lives, namely 51.5% and 55.9%. Meanwhile, 48.5% received tickets during police operations, and 44.1% received not during police operations. Another finding was the respondents' experience of having an accident. A total of 61.2% of respondents claimed to have experienced an accident. Most of them, 55.6%, had experienced moderate accidents (suffering minor injuries but with damage to vehicles and goods). Then, 35.3% experienced minor accidents (only suffered vehicle damage), and as many as 8.2% experienced severe accidents (suffered serious injuries).

Respondents responded to five of the ten images showing a lack of understanding of safe driving, namely those showing riders and passengers not wearing helmets (appendix

images B1, B2, B3, B4, and B6). Responses on three images showing a lack of understanding of traffic rules, which are two showing a rider and his passenger using the sidewalk to get around traffic, and one showing a group of riders moving from the opposite lane of the road in an attempt to bypass or merge into the direction allowed by the traffic signal at an intersection (appendix images B7, B8, and B9).

Image B7 is a horizontal view of a similar situation recorded by a drone camera (appendix image A1.2), although not on the same day. Finally, responses of two images as daily habits, namely an image showing some motorists squeezing between two four-wheelers (appendix image B5) and an image showing the stark difference in traffic flow on two opposing lanes of the road (appendix image B10). In addition, respondents generally agreed that the things shown could potentially cause injury or loss. The most considerable agreement (64.8%) is to the traffic chaos at night and the presence of drivers going against traffic directions and not wearing helmets, as shown in image B4 in the questionnaire. In comparison, the lowest agreement (48.2%) is to image B10. Disagreement over the potential for injury or loss was highest for image B2 and lowest for image B3. The respondents also gave neutral statements on the possibility of injury or loss, the most in image B10 and the least in image B4. For image B7, 62.7% of respondents agreed with the possibility of injury or loss, 12.1% were neutral, and 25.2% disagreed with the possibility of such occurrences.

3.3 Discussion

The behavior of motorcyclists in traffic shows chaos, such as stopping out of place. When congestion occurs and the flow of vehicles continues, motorcyclists attempt to pass other vehicles and maneuver between other types of vehicles also experiencing congestion. Motorcyclists also move against traffic direction or change lanes and ride their motorcycles on the sidewalk. These behaviors reflect social entropy. After all, they disregard safety and manifest cultural entropy because they disregard rules that lead to harm.

However, there are variations or relativity of responses regarding such behaviors. The context was more about a lack of understanding of motorcycle safety. Other responses also tend to give context of disregarding or lack of understanding of the traffic rules. The context of daily habits also seems to place the violations and hazards shown as a common occurrence. Such context means that the visibility of the motorcyclist's behavior does not show it as a mere violation or deviation. This visibility contradicts or reverses the meaning that motorcyclists do not obey the rules. Traffic control devices, such as signs, markings, signals, and authorized control officers, are visible, and their purpose is understood, but they do not alleviate the problem of traffic regulation. Interpreting the behavior of motorcyclists during traffic jams as violations and deviations may have placed the traffic rules and enforcement efforts in limbo because their existence cannot alleviate safety in driving, especially during traffic jams.

The behavior of motorcyclists when stuck in traffic is a form of adaptation. The movement of preceding other people's vehicles, slipping between other vehicles, and changing lanes is a common form of driving. Nevertheless, when all of them are put together in one rider's movement when facing or in order to reach the traffic situation, it can be said to be an innovation of the riders in traffic. When more than one or two drivers do it, and it repeatedly happens so that it creates a pattern, then it can be said to have become a ritual because many motorcyclists learn about driving informally. These adaptations are not impossible to obtain from the results of learning in their daily motorcycle riding in urban road spaces.

The motorcyclist learns by observing the behavior of fellow drivers, such as cutting off other vehicles, either in the same lane or even from a different lane, going against the flow, and even stopping out of place. When motorcyclists within the scope of view of other motorcyclists make these movements, it is not impossible that imitation occurs, or in other words, there is knowledge of driving learned among fellow motorcyclists.

Adaptation and learning experiences of motorcyclists have led to a more significant demonstration of safety awareness, which means that there is recognition of experiencing injuries and losses. However, the demonstrated understanding of safety is still limited to the possibility of physical harm (i.e., not wearing a helmet). Furthermore, the possibility of material loss is considered more related to behaviors that violate traffic rules. Even stark differences in traffic flow conditions are considered part of everyday life. These differences are the reason for a failure to recognize injuries or losses on fellow motorcyclists, motorcyclists, and other vehicles or other road users' experiences. That is especially true if one only emphasizes injuries or losses that are obvious, such as motorcycle accidents, but ignores or seems to nullify injuries that are not easily visible, such as psychological disorders as a result of the ritual of living in traffic every day, or respiratory problems due to always being in traffic situations. Even injuries and losses are caused by those responsible for the traffic situations and conditions, such as the police and the government (regional and central). The uncontrolled number of motorcycle ownership, followed by the lack of traffic flow regulation that considers the high number of motorcycles, coupled with the importance of vehicle flow over driving safety, has made motorcyclists grapple with the experience of injuries and losses.

4. Conclusions

The study was based solely on recorded visuals and responses from motorcyclists' experiences. Furthermore, based on congestion trends, visual data collection is limited to a narrow time frame: early weekdays. Unfortunately, because of a technical hitch regarding the equipment and personnel, only two days' worth of visual data could be collected. There is also another factor, namely the sound that surrounds traffic conditions. For example, the sound of the horn produced by the vehicle while driving and the voice of motorcyclists in conditions of congestion or chaos in traffic. Other research can be developed by including the surrounding sounds using the sensory criminology approach (McClanahan and South, 2020; Fraser in Herrity et al., 2021). This approach can potentially alleviate the struggles experienced by motorcyclists and can even make comparisons to other road users, such as pedestrians or pedal cyclists.

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