

# *Bodaboda drivers' behaviour*

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**Abstract** In Tanzania between 2006 and 2014, the number of registrations for 2 or 3 wheeled vehicles has been climbing, with 20,117 in 2006 and 185,100 in 2014. In 2014 more than 50% of registered vehicles were motorized 2 and 3 wheelers, and 22% of the deaths caused by crash accidents were drivers of this kind of vehicle. One of the great challenges for countries as Tanzania, is to confront the fatalistic beliefs of commercial (called 'Bodaboda') and recreational African motorcycle drivers and improve their knowledge of the road. This study is the second part of a traffic psychology project for Bodaboda drivers of the Arusha region in Tanzania. A first version of the questionnaire was distributed in Arusha city in March-April 2016. A final version of the BbQ was written in Swahili after a focus group with Swahili-English speakers and was distributed to 513 Bodaboda drivers in Arusha in December 2016. The distribution was carried out by 14 trained interviewers. The 513 subjects replied to 46 questions to investigate 7 different sections: demographic information, protective equipment, passengers, maintenance of motorcycle, police fines and bribes, driver's crash history and reason. 47.9% of the Bodaboda drivers have been involved in a crash, the most frequent cause of is poor driving skill (56.1%) and for 10.5% of the subject crash-avoidance was impossible because crashes are predestined. The Bodaboda drivers was also recorded with a video camera in Arusha in August 2017 in order to understand the gap between questionnaire's answers and real driving behaviors.

**Keywords:** road safety; taxi motorcycle; driver's behavior; questionnaire.

## I. INTRODUCTION

Every year, more than 1.2 million deaths are directly caused by road crashes [1], and more than 75 million road users are injured and a further fifty million road users are seriously injured [2]. The severity of these injuries and fatalities is not homogeneously distributed throughout countries in the world. The low- and middle-income countries (LMIC) register more than 90 percent of the world's traffic fatalities but they only account for 50 percent of motorized traffic in the world [1]. In sub-Saharan Africa the average mortality rate per 100,000 population is 26.6, while the global average is 17.4. In the country of Tanzania, the situation is even more alarming, the WHO estimates that more than 16,000 people are killed in traffic each year, which equals 32.9 traffic deaths per 100,000 population [3]. The Tanzanian Traffic Police reports that the highest share (33%) of the road related fatalities in Tanzania in 2015 consisted of motorcycle riders [4]. While these numbers are alarming by themselves, the number of injured and killed motorcycle riders is projected to increase. There were approximately 800,000 motorcycles registered in Tanzania in 2014, and their number increases by 148,000 every year [1][5]. The high number of motorcycle rider fatalities and the rapid increase in the number of motorcycles calls for effective measures to be undertaken to improve the road safety of motorcycle riders in Tanzania. This is why researchers and road

safety NGOs have started to investigate critical road user behavior that influences road safety and to try to defeat one of the great challenges for countries as Tanzania, confront the fatalistic beliefs of commercial and recreational African motorcycle drivers and improve their knowledge of the road [6]. Increased attention has been given to the role of so called Bodaboda drivers, who use their motorcycles commercially to transport goods or passengers. Since 2010, Bodaboda drivers are obligated to register with a Bodaboda organization, which allows directed targeting of safety relevant behavior of Bodaboda drivers through these organizations [7]. Existing regulations mandate that Bodaboda drivers are only allowed to transport one passenger, need to wear a high visibility safety vest, use a motorcycle helmet, and only transport passengers that also use a helmet. Road traffic legislation, regulation, and strict police enforcement are proven to be effective methods to increase road safety [8]. Through Bodaboda organizations, commercial motorcycle drivers in Tanzania are subject to special regulations and they are therefore a useful object of study. Prior research has shown an impact of road safety education of the Bodaboda drivers on their use of motorcycle helmets, safety vests, and the number of the crashes they are involved in [5][9]. This study aims to investigate safety relevant road behavior of Bodaboda drivers in detail. The Bodaboda questionnaire can help researchers in low-and middle-income countries to better understand the relationship between behavior, fatalistic beliefs, mental representation of risk and safety in commercial motorcycle drivers, and thereby allow targeted road safety programs and legislation [10]. Ultimately the better understanding of motorcycle drivers' behavior can prevent an increase in the number of road crashes.

## II. METHOD

The Bodaboda questionnaire was developed in an iterative process as part of a project on road safety in Tanzania undertaken by researchers from the Università Cattolica del Sacro Cuore of Milan, from Center for Accident Research and Road Safety of Queensland (CARRS-Q) and from Technische Universität of Berlin. A first version of the questionnaire with 37 items was developed from the ground up in English and then translated to Swahili. This version was divided in 6 different sections: socio-demographic information, use of the protective equipment as helmet and vest, behavior of the passengers, maintenance of the motorcycle, number of the police fines and driver's crash history. This first draft of the Bodaboda questionnaire (BbQ) was distributed to 54 Bodaboda drivers in Arusha city during the months of March and April 2016. The results of the data analysis of the first version highlighted some problems of understanding the questions and also some difficulties in the cultural setting of the questions. These gaps helped to write the new, revised version of the BbQ with 44

items and with questions more focused on the Tanzanian road culture. In this paper, only the structure and the results of the final questionnaire will be discussed.

#### A. Development and items

The final questionnaire consisted of 44 items and they are answered in different formats, including multiple-choice, open responses, and anchored Likert-scales. Likert-scale responses were explained to represent the categories 1=never, 2= rarely, 3=sometimes, 4=often, 5=always. The BbQ contains questions of seven categories: socio-demographic information on drivers, use of the protective equipment (helmet and vest), passenger behavior, maintenance of motorcycle, police fines and bribes, crash history, and causes of road crashes. The final version of the BbQ was written in English first, and subsequently translated to Swahili after a focus group with bilingual Swahili- English Tanzanian people and moreover two certified Swahili-English speakers were tasked to verify the correct translation to Swahili from English.

#### B. Distribution

The BbQ was distributed to 513 Bodaboda drivers in Arusha City in December 2016. Participants were assured complete anonymity and confidentiality. The distribution was carried out by 14 Tanzanian interviewers trained with 8 hours of coursework about the techniques of administration of the BbQ by a traffic psychologist. Four teams of interviewers distributed the questionnaire along the four main roads of Arusha City approaching Bodaboda drivers stopped at the side of the road. The background of the questionnaire was explained to drivers and response types were clarified in detail. Interviewees were also informed that they could choose not to respond to questions if they chose so. Drivers then filled out the questionnaires in Swahili or in English. If a driver was unable to read or write, the interviewer filled out the questionnaire for the driver.

### III. RESULTS

#### A. Demographics

The sample consisted of 513 Bodaboda drivers. They had a relatively low mean age of 27.56 years ( $SD = 5.67$ ). Almost all of the interviewed drivers (98.2%) were male, and a majority of drivers live in urban areas (72%). Half of the drivers' state that their highest education was a primary school (50.7%), a third (29.8%) attended secondary school, and approximately one fifth (17.5%) does not have any type of formal education. 62.2% of all drivers are married and 59.1% have at least one child. The majority of drivers interviewed consider themselves to be good drivers (95.1%).

#### B. Work related background and crash history

Of all drivers, only 76% declare to have a driver's license. Drivers in the sample have been working as Bodaboda drivers for an average of  $M = 3.6$  years ( $SD = 2.2$ ), with 55.9% of all drivers having worked in the job for less than three years. The motorcycles used by drivers are relatively new, with an average age of  $M = 2.4$  years ( $SD = 1.6$ ). The majority of drivers (86%) mainly work in the urban area of Arusha City, while the rest (13.8%) works in surrounding rural areas. More than half of sampled drivers (55.4%) are members of a Bodaboda organization. While only 52% of these drivers name their

organization, almost all of these drivers (88.8%) are members of the same organization (Uwapa Bodaboda Organization). On average, drivers transport 17.1 passengers per day ( $SD = 5.6$ ). Of all drivers, 69% report that they have been fined by the police in the past, with more than half of these drivers (57.7%) having been fined more than once. Approximately half of the drivers (47.6%) admit to having bribed the traffic police in the past. While 51.9% of the Bodaboda drivers interviewed in this study have never been involved in a crash, 47.9% of them have been involved in a crash during their career, with 60.2% of these drivers having been involved in more than one crash. One third of drivers interviewed (34.5%) suffered an injury from a crash. Moreover, only 7% told they have never even avoided a crash, while 39.4% declared they did avoid a crash. Answers to the question about how a crash could have been avoided were categorized. The most common answer to how a crash could have been avoided was that crash-avoidance was impossible because crashes are predestined (10.5%). Adherence to road traffic rules by the driver interviewed (8.2%) or by other drivers (6.2%) was named, as well as paying more attention to the road by the driver (6.2%) or other drivers (3.3%). A third of drivers interviewed (34.5%) suffered an injury from a crash, and one out of four (26.9%) avoid an injury in a road crash, and the main causes are "fatalism" (10.9%) and rules violation (4.1%). When asked about the most frequent cause of a crash, a majority of the drivers (56.1%) names poor driving technique as a cause. 21.2% of drivers name traffic rule violations and 11.5% indicate poor Bodaboda maintenance as the main cause. Interestingly, fatalism is listed by only 1.9% of the drivers as a main cause of crashes.

#### C. Motorcycle maintenance

A majority of drivers (89.1%) consider their Bodaboda to be a safe vehicle, and 65.5% report that they have checked the safety of their Bodaboda in the last year. Of all drivers, 68.6% report that they checked their tires in the last week, and 62.8% report to have checked their brake in the last year. 81.5% of drivers report to have back mirror on their Bodaboda.

#### D. Safety relevant road behaviour of drivers

The vast majority of Bodaboda drivers (82.1%) declare that they follow the rules of the road "always" or "often", Fig. 1. However, only one third of drivers (29.3%) declare that they "never" transport more than one passenger, while 45.5% of drivers admit to transporting multiple passengers "rarely" and "sometimes". This is illegal under existing regulations [7]. Furthermore, one third of drivers (29.6%) reports to "never" use a mobile phone while driving, while 43.6% percent of drivers admit to "rarely" or "sometimes" using the phone. One quarter of drivers (25.7%) report that they use the mobile phone "often" or "always". Only 42.1% of drivers declare to always use a motorcycle helmet. 44.4% report to use it "often" or "sometimes", while 12.7% report to use it "rarely" or "never". The majority of drivers (55.6%) admit to not wearing a high-visibility safety vest. On third of drivers (35.7%) admits having driven their motorcycle while being under the influence of alcohol or drugs.

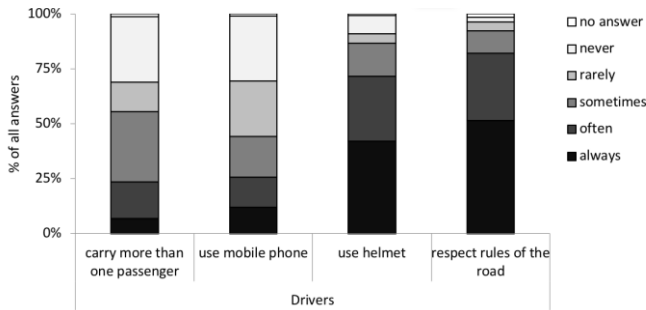


Fig. 1. Reported safety related behaviour by drivers.

### E. Reported behaviour of passengers

Apart from questions about their own road safety relevant behaviour, drivers were also asked about the behaviour of their passengers, Fig. 2. According to 38.8% of drivers, passengers “often” or “always” ask them to disobey rules of the road. A majority of the interviewed drivers report that their passengers use helmets never (37.8%) or rarely (25.5%). Only 9.6% of drivers report that their passengers “always” wear a helmet. These numbers are even lower for the use of a high-visibility safety vest, only 10.1% of drivers report that their passengers use a safety vest “always” or “often”, while 50.3% admit that their passengers “never” wear a safety vest.

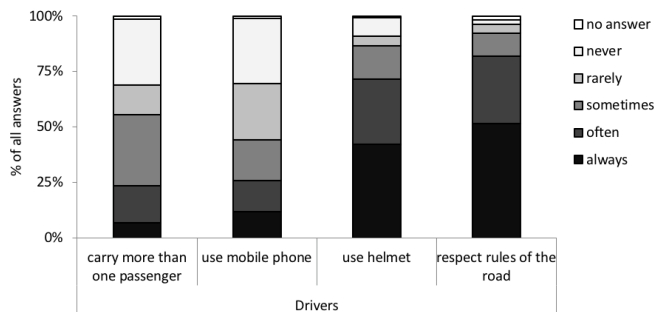


Fig. 2. Reported safety related behaviour by passengers.

## IV. DISCUSSION

This investigation of the road behavior of commercial motorcycle drivers in Tanzania reveals a distressing status of road safety in the country, as many Bodaboda drivers do not adhere to road rules. A majority of drivers admit to illegal conduct such as not always wearing a helmet, using their mobile phone while driving, and transporting more than one passenger on their motorcycle. One third of drivers admit having driven under the influence of alcohol or drugs in the past. Although the experience of drivers is relatively short, as 55.9% of them have worked as a Bodaboda driver for less than three years, almost half of the drivers have already been involved in a crash during their career, about one third have suffered injuries from this crash and the most common answer about how to avoid the crash with their motorcycle is that the crash-avoidance is impossible because crashes are predestined. An analysis of potential positive impacts of safe actions, cultivated by an affiliation to a Bodaboda organization, did not show any significant positive impact of the membership in such an organization on drivers’ behavior [5]. Alarming, the enforcement of traffic rules by the police appears to be

inadequate, as almost half of the drivers in this sample admit to having bribed the traffic police in the past. Furthermore, this questionnaire study revealed a disparity in the view of responsibility for breaking road rules. Drivers shift the blame for traffic offenses from themselves to passengers, which ask the drivers to disobey traffic rules [10].

On a positive side, this study reveals utilizable points of action to increase safe driver behavior and road safety in Tanzania [11]. As more than half of interviewed drivers belong to a Bodaboda organization, these organizations can and should be involved in facilitating safe driver conduct. Legislation could be used to make it mandatory for Bodaboda organization to supply helmets to their drivers and require the drivers to carry an extra helmet for their passengers and to give to their driver road safety courses to try to improve the road knowledges and at the same time to decrease the fatalistic beliefs.

The Bodaboda questionnaire proved to be a valuable tool for assessing the road behavior of commercial motorcycle drivers. It is easy to administer and takes only a relatively short amount of time to answer. With some adaptation and more information, it can be converted into a questionnaire that can be answered without the help of an interviewer, making it easier to distribute. Admittedly, the questionnaire has its limitations as it only collects reported actions and drivers might not answer truthfully. Hence, the BbQ has been coupled with observational data to assess truthfulness of answers and the videos are being decoded. The videos have been recorded in four different places in Arusha City in August 2017, in the same places where it was organized the distribution of the BbQ, Fig. 3, and the data will be available soon. The results of this investigation represent a wakeup call for road safety actors in Tanzania and sub-Saharan Africa.



Fig. 3. Place 1 of the Video Camera in Arusha City

Commercial motorcycle drivers show various kinds of illegal behavior, and effective police enforcement is hampered by widespread bribery. An immediate push for increased police enforcement, coupled with deterrence for bribery, and a modification of existing legislation is needed to improve road safety in Tanzania.

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