

# THE PERFORMANCE OF THE MOTORCYCLE RIDER BEHAVIOUR QUESTIONNAIRE (MRBQ) AMONG COMMERCIAL MOTORCYCLE RIDERS IN NIGERIA

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# Introduction: Scope of the problem

- In Nigeria, motorcycle is very popular as a means of transportation:
- 52% of all license plates issued in 2004 were for motorcycles (FRSC, 2005)



# Introduction: Scope of the problem

- This popularity largely stems from:
  - Low cost relative to four wheeled vehicles
  - Easy manoeuvrability in the often chaotic road environment found in most LIC/MIC's.



# Introduction: Scope of the problem

- But, motorcycles are also inherently more vulnerable:
  - Motorcyclists are about 35 times more likely to die than passenger car occupants and
  - 8 times more likely to be injured (NHTSA)

# Introduction: Scope of the problem

- Epidemiological principles are becoming increasingly useful in understanding trauma phenomena (Margie Peden, 2004)
- In motorcycle trauma, the factors contributing to road crashes can be divided into the following:
  - The motorcycle
  - The motorcyclist
  - The environment in which rider rides (e.g. traffic, road type and weather conditions)

# Introduction: Scope of the problem

- Two of the most important characteristics of the rider are **rider behaviour** and **attitude**
- Relatively little has been written about them
- Aspects of riding behaviours that have been found to correlate with crash risks include
  - speeding
  - drink-driving
  - poor observation
  - signalling at junctions

(Elliott, et al., 2007)

# Introduction

- There is a need for a tool that can measure and predict rider behaviour
- Such a tool is the Motorcycle Rider Behaviour Questionnaire (MRBQ)

(Elliott, et al., 2007).

# Motorcycle Rider Behaviour Questionnaire (MRBQ)

- The MRBQ revealed that motorcycle rider behaviours could be explained by a five-factor structured model:
  - traffic errors
  - control errors
  - speed violations
  - performance of stunts
  - use of safety equipment

(Elliott, et al., 2007).

# Motorcycle Rider Behaviour Questionnaire (MRBQ)

- **Traffic errors** were mostly associated with hazards perception or observational skills
- **Control errors** had to do with speed
- **Speed violations** had to do with speed selection
- **Stunts** were associated with performing dangerous feats to gain attention

(Elliott, et al., 2007).

# Motorcycle Rider Behaviour Questionnaire (MRBQ)

- Their findings were:
  - Traffic errors and control errors were the most consistent predictor of crash involvement.
  - Stunt and speeding behaviours were less consistent in predicting accident liability.
- Their conclusion:
  - Motorcycle safety stems directly from the **motivation** that prompts people to ride motorcycles in the first place

(Elliott, et al., 2007).

# Introduction

- Also the social environment including other road users, general social norms as well as formal and informal traffic rules, influence every individual driver
- Therefore the performances of a behaviour questionnaires may differ in different countries and cultures

(Ozkan et al., 2006)

# Introduction

- For example, most motorcyclists in Nigeria are driven by economic imperatives.
- Commercial motorcyclists in Nigeria are called **Okada** ([http://en.wikipedia.org/wiki/Okada\\_\(commercial\\_motorcycle\)](http://en.wikipedia.org/wiki/Okada_(commercial_motorcycle)))
- They are therefore **motivated** largely by the need to turn profit (oluwadiya et al, 2005)



# Aims of the study

- i. Investigate the factor structure of the MRBQ in Nigerian motorcyclists
- ii. Compared its performance in Nigerian motorcyclists to British motorcyclists
- iii. Examine the relationship between the MRBQ factors and self-reported crash involvement of the riders.

# Aims of the study

- Finally, we will discuss possible ways in which findings from this study can help in formulating policies directed at reducing motorcycle crash rates and injuries.

# Methodology: Study Instrument

- The original MRBQ was a 43 item questionnaire made up of:
  - Traffic errors (13 items)
  - Control errors (7 items)
  - Speed violations (10 items)
  - Stunts (6 items)
  - Use of safety equipment (7 items)

## Methodology: Cultural adaptation of the MRBQ

- Nigerian version was devised by rewording and making necessary modifications to adapt the questionnaire items to the Nigerian socio-cultural context.
- Pilot study of the reworded questionnaire done on 20 motorcyclist
- Overall, 7 items were removed, 11 reworded, 6 new items added, 22 unchanged.....
- ....Ended with a 40-item questionnaire

# Methodology: Analysis

- Principal component analysis (PCA) with Varimax rotation was run to examine the factor structure of the MRBQ.
- Cronbach's alpha reliability coefficients were calculated for assessing the internal consistency of the MRBQ scale scores.
- Generalized Linear Modelling (GLM) was performed with crash involvement as dependent variable, and MRBQ factors, age, experience, motorcycle usage and alcohol use, as independent variables.

# Result

- 500 motorcyclists were interviewed
- Mean age:27 years

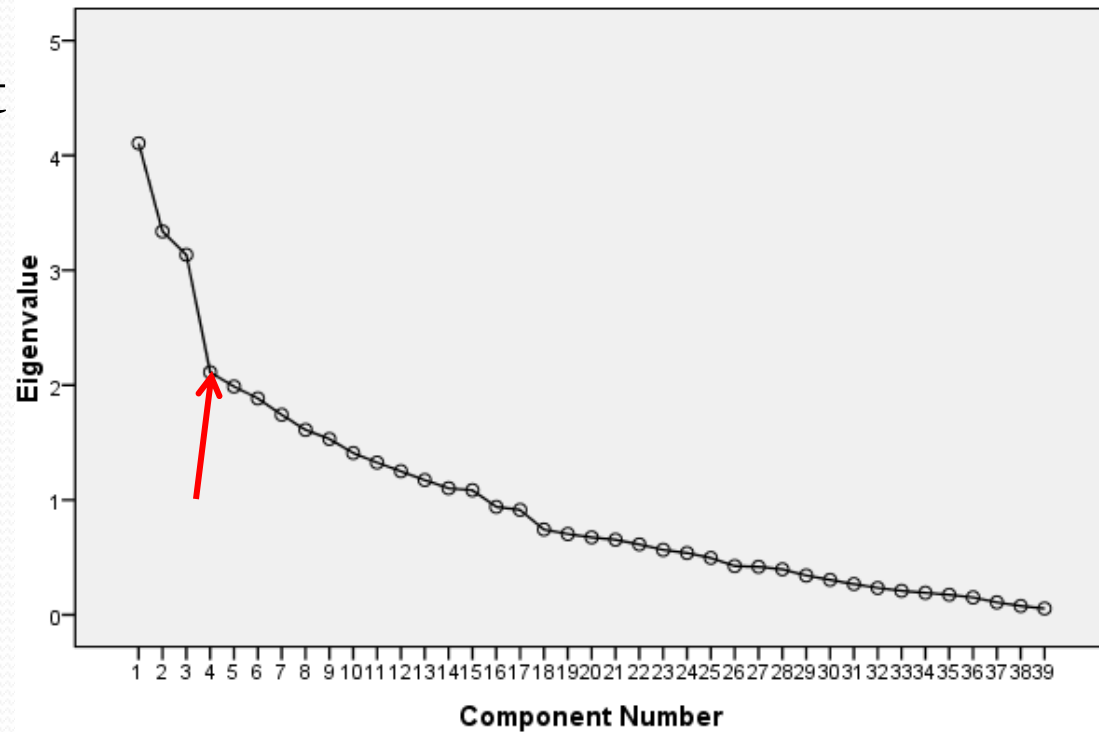
Riding History	Frequency (%)
Formal training	12 (2.4%)
Have license	36 (7.4%)
Have license on them	14 (2.8%)
Past crash involvement	110 (22%)
Past traffic violation	124 (24.8%)

# Result: Factor structure

- The criteria used to determine the number of factors that would best fit the data were:
  - i. Kaiser criterion of eigenvalues  $> 1.0$
  - ii. Scree plot and
  - iii. Parallel analysis

# Result: Factor structure

- Best factor structure:
  - 4-factors indicating that there were four basic types of behaviours underpinning the MRBQ among Nigerian motorcycle riders
  - The rotated factors accounted for 32.5% of the total variance



# Result: Factor structure

- **The first factor**

- Included eleven items which seemed to deal with issues of safety and control
- We therefore labelled it **SAFETY/CONTROL**
- It accounted for 10.5% of the total variance in the data.
- The mean of the items were used to produce the control/safety composite scale for further data analysis.

# Result: Factor structure

- **The second factor**
  - Contains 9 items which seemed to describe activities related to stunts.
  - We therefore labelled it **STUNT**
  - Accounted for 8.6% of the total variance
  - 2 of the items (“Wear gloves” and “Distracted or pre-occupied, you belatedly realize that the vehicle in front has slowed and you have to brake hard to avoid a collision”) could not be considered to be in this group, and were excluded from the composite scale that was used for further analysis

# Result: Factor structure

- **The third factor**

- Consisted of four factors which seems to deal with issues of errors
- We therefore labelled it **ERROR**
- Accounted for 8.0% of the total variance.

# Result: Factor structure

- **Fourth factor**
  - Loaded 7 items
  - All seven items were related not only to speeding but also to haste
  - We therefore labelled it **SPEEDING/IMPATIENCE**
- Five items did not load under any of the components

# Result: Reliability analysis

- The Cronbach alpha for all the items was 0.526
- Low when compared compared to the original MRBQ among British subjects

## Relationship between crash involvement and the factors

Variables	B	Std. Error	Z	95% CI	P	
<b>MRBQ Factors:</b>						
Speed/Impatience	0.092	0.0402	2.29	.014-.171	0.021	←
Error	0.04	0.0282	1.42	-0.111	0.153	
Stunt	-0.064	0.0406	-1.58	-0.159	0.113	
Control/Safety	-0.006	0.0554	-0.11	-0.217	0.918	
<b>Demographic Characteristics</b>						
Experience	-0.021	0.0047	-4.47	-0.018	<.001	←
Age	-0.002	0.0019	0.01	-0.007	0.405	
Previous violation	0.018	0.031	0.03	-0.121	0.569	
Alcohol use = Yes	0.11	0.024	0.02	.063-.157	<.001	←
<b>Motorcycle Usage:</b>						
For Business	0.198	0.0433	0.04	.113-.283	<.001	←
Government	-0.423	0.1429	0.14	-0.56	0.003	←
Private & Comm.	0.014	0.0254	0.03	-0.675	0.568	
Private	0.073	0.0355	0.04	.004-.143	0.039	←

# Discussion

- This will be discussed under the following headings:
  - i. The MRBQ factor structure,
  - ii. Prediction of motorcyclists' crash risk from the MRBQ factors as well as the other demographic data
  - iii. The implications of the findings for road safety interventions

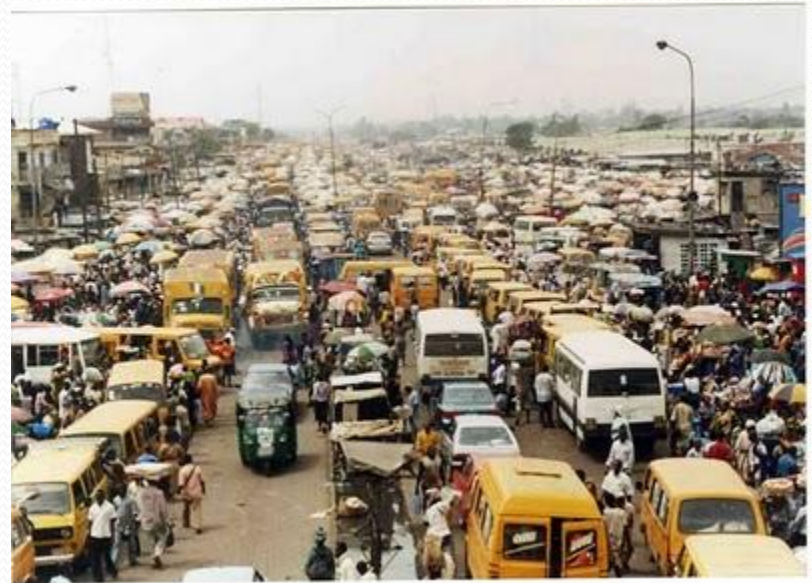
# Discussion: MRBQ factor structure

- Five major differences between the factor structure in British motorcyclists and their Nigerian counterparts

# Discussion: MRBQ factor structure

1.

MRBQ items loaded under four factors in Nigerian motorcyclists while it loaded under 5 factors among British motorcyclists



# Discussion: MRBQ factor structure

2.

In Nigerian motorcyclists, Items loaded under factors that were different from the factors under which they loaded in their British counterparts



# Discussion: MRBQ factor structure

3.

There is a blurring of the distinction between control and safety which was apparent in the original MRBQ study, so that the two were perceived as one among Nigerian motorcyclists



# Discussion: MRBQ factor structure

4.

Items which were classified as pure speed behaviours among British riders became blurred to include items that imply impatience in Nigerian motorcyclists.



# Discussion: MRBQ factor structure

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The composite scores of the factors were higher among the Nigerian motorcyclists than their British counterparts, meaning that the frequency of such behaviours is higher among the former



# Discussion: Predicting crash risks

- In the British MRBQ study, traffic error was the significant predictive factor, whereas the predictive factor in the present study was speed/impatience.
- Alcohol intake was a positive predictor
- Experience was a negative predictor
- Age was not a significant predictor
- Private/business motorcyclists were positive predictors

# Discussion: Implications for control

- Interventions targeted at improving road behaviours will be important in reducing motorcycle crashes
- Policy makers should also target certain groups of motorcyclists for safety intervention campaigns, including private motorcyclists and company vehicles
- Enforcement of training

# Conclusion

- This study showed that in Nigeria, the MRBQ performed differently from British motorcyclists. The factor structure has decreased to four, and it was not as reliable. However, one of the factors; speed/impatience as well as other socio-demographic variables including experience, alcohol use and motorcycle usage are important predictors of crash liability among Nigerian motorcycle riders. Policy makers can achieve reduction in motorcycle crashes by focusing, among other things, on these factors.

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