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Influence of Big Five Personality Traits and Locus of Control on Road Safety Rules Compliance among Motorcycle Riders in North-Central Nigeria

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Abstract – *The study investigated the influence of the Big Five Personality Traits and locus of control on road safety rules compliance among motorcycle riders in North-Central Nigeria. Two hundred and sixty four (232 males and 32 females) respondents were purposively sampled to participate in the study. Their ages ranged from 15 to 60 years with the mean age of 27.19 years. Cross sectional research design was employed for the study. Hierarchical regression was used to test the hypotheses. Consistent with hypothesis one, extraversion, agreeableness, conscientiousness, neuroticism and openness statistically predicted road safety rules compliance significantly ($\Delta R^2= 0.08$, $F_{(5, 181)} = 3.32$; $P<0.01$). Independently, extraversion, conscientiousness, neuroticism and openness did not predict road safety rules compliance significantly. Agreeableness however significantly predicted road safety rules compliance significantly ($t= 2.50$, $P< 0.05$, $\beta= 0.30$). Locus of control did not significantly predict road safety rules compliance ($\Delta R^2= 0.01$, $F_{(1, 180)} = 1.44$; $P>0.05$).These results were explained in line with the standard of living of people in Nigeria. It was recommended that frequent enlightenment programmes should be organized for Motorcycle riders to ensure road safety rules compliance.*

Keywords–*Locus of Control, Motorcycle Riders, Nigeria, Personality Traits, Road Safety, Rules-compliance*

INTRODUCTION

A worrisome factor accountable for road accidents in Nigeria is traceable to the use of motorcycles for transportation. These motorcycles are used mostly for ease of transportation in many parts of Nigeria, out of which a greater number is used for commercial purposes to either consolidate income, increase household earnings or strongly as a means of livelihood. There is an agreement to this statement that commercial motorcyclists popularly called okada riders are used in Nigeria to bridge the transportation gap in most cities across the country [1].

Literature has revealed that there is an increasing use of motorcycles for commercial activities in the urban cities in Nigeria. This increase in commercial motorcycling has become a great source of morbidity and mortality [2]. Research has linked these injuries and mortality rates to factors such as poor helmet use, narrow roads, navigating through increasing traffic, poor licensing of the motorcycle riders and importantly, non-compliance to road safety rules among other factors. Hence, road traffic accidents common amongst motorcycle riders is becoming a trend in most parts of Nigeria [3]. This study established that motorcycle accidents is a significant contributor of road traffic accidents (RTA) in many cities across the country. This trend has become one of the leading causes of disability and deaths, which include victims such as motorcyclists themselves, passengers and pedestrians especially individuals in the young productive age groups.

In a Malaysian study, prevalence of road traffic accidents was rated at 55-57% of the total number of road accidents and 60% of traffic fatalities. This prevalence varies globally, from 28.8% in China [4] to as high as 62% in Vietnam [5]. It is on record that in Nigeria prevalence of motorcycle injury ranges from 12.8% - 60% [7], [8], [9]. Going back in time, road accidents have been traced to have begun in Lagos Nigeria in 1906, and has remained a major killer in Nigeria [10]. Consequently, the Benin Zone of the Federal Road Safety Corps has said that it recorded 65

road crashes in June 2014 in Anambra, Delta and Edo states, and 29 people were killed in the accidents during the period. Also, during patrol operations in these states mentioned, 5,135 traffic offenders were arrested, they included drivers and motorcyclists who disobeyed different traffic rules for committing 5,708 traffic offences for the month of June 2014 alone. The Zonal Commander's words are thus: "We carried out mobile courts, Edo, Delta and Anambra; 806 traffic offenders out of the 5, 135 offenders were prosecuted, arraigned before the mobile courts; 725 of those arraigned were convicted and 12 were discharged and acquitted".

The efforts to reduce the rate and severity of road accidents through compliance necessitated the formulation of road traffic regulations to guide the operation, conduct and other issues relating to the road. The term compliance is the act of conforming to, yielding readily to others. Most appropriately in relation to the present study, it means to act in accordance with laid down orders. The term compliance in road safety is the adherence to rules guiding road usage by road users [11]. Consequently, the aim of these rules is to justify, avoid conflict among road users; and mitigate the effect of unpleasant events. Non-compliance carries penalty. The road traffic regulation agencies define penalties in their given societal contexts. It has been stated that penalties in road traffic law enforcement in order of severity, range from; no action, written or verbal warning, fines, to prosecution or arrest [12]. These penalty options help to regulate the behaviour of the road user and enforce punitive measures to offenders depending on severity of offence [13], [14], [15], [16], and [17]. The aim of the penalty is to serve as deterrence, which is to prevent non-compliant behaviour.

The failure of drivers to comply with basic road safety rules is the main cause of serious crashes. This assertion is supported by a schorlar whose statement supports that, non compliance to traffic rules is an important factor responsible for traffic accidents and many lives could be saved if all drivers complied with the rules [18]. In the Nigerian context, compliance with road traffic rules among motorcycle riders has become a massive challenge both for the law enforcements and the government. There have been incessant violations of traffic rules by motorcyclists, and this situation thrives when motorcyclists deliberately disobey formally prohibited or socially accepted codes of driving behaviour. Similarly, the

World Health Organization noted that the overall goal of the Decade of Action for Road Safety 2011 – 2020 is to stabilize and also reduce the forecast level of road traffic fatalities around the World by 2020 [19]. It is further explained that the activities to achieve the goal above will take place at all levels. So, to organize this at the national level in Nigeria, stabilizing and reducing road fatalities from motorcycles will require inquiry into compliance with road traffic regulations in order to provide direction for enforcement, which is in line with the safe system approach [11]. Therefore, this research aims at examining the influence of the big five personality traits and locus of control on road safety rules compliance among motorcycle riders in Nigeria.

Big-five Personality Traits and Road Safety Rules Compliance
Personality is an important component of psychological factors affecting human behaviour. This behaviour may also include road safety rules compliance. Some studies have explored the big-five personality traits in relation to non-compliance with traffic rules. The big five traits include openness, conscientiousness, extraversion, agreeableness and neuroticism. Openness reflects the degree of intellectual curiosity, creativity and a preference for novelty. Conscientiousness depicts the tendency to be organized, dependable, discipline and sense of duty. Extraversion trait is characterized by energy, positive emotions, sociability and the tendency to seek stimulation in the company of others. Agreeableness entails the tendency to be compassionate and cooperative rather than suspicious and antagonistic towards others. And a neurotic personality experiences unpleasant emotions easily, such as anger, anxiety. Neuroticism refers to the degree of emotional stability and impulse control.

Another name for non-compliance is violation behaviour which in a study, has been found that personality traits and attitude significantly influence violation of traffic rules [18]. The study also established that violation of traffic rules is an important factor behind traffic accidents and many lives could be saved if all motorcycle riders complied with the rules. The need for rules about driving behaviour is shown by the fact that the leading cause of death among 15 to 44 year olds is related to injury as regards driving [20]. They further go ahead to answer the question on why people break rules if the potential consequences are so severe.

In answer to the question, it is worthy of note that people get into the road for various reasons: having the desire to reach a destination, the pleasure of fast driving, to make an impression on others, and to experience feelings of power and control. This is to say that the goals of driving are crucial in enhancing driving safety, and have been found to change with advancing age [21]. Some authors noted that motives for driving are important predictors of aggressive driving. They identify tailgating, weaving, speeding, running red lights, blocking passing lanes, honking horns, using profanity, making obscene gestures and flashing headlights as instances of aggressive driving behaviour.

In addition, it has been found that time pressure, a tendency towards risk and arousal and the widespread acceptance of competitive behaviour contributes to individuals' willingness to drive aggressively and break road rules [22]. They also found that aggressive driving was positively associated with the number of miles driven per year, a need to win and emotional instability, while aggressive driving was negatively associated with conscientiousness and the need for learning.

Consistently, personality traits in another study are found to highly influence motorcycle riding [21], and it is suggested that the personality traits associated with aggressive driving and riding anger which result to non-compliance to traffic rules are expressed when situations arise which provoke them. They highlight risk factors and provocative situations to include traffic congestion, stress, heat, alcohol and drug use, smoking, being a young male and being unmarried [22]. In another study, people who are low in agreeableness are found to be uncooperative, manipulative, tend not to follow rules, and cheat to get ahead [23]. Similarly, various studies [24], [25], [26] found personality factors that relate to risky driving and rule breaking to include locus of control, driver/rider anger arising from neuroticism, sensation seeking and normlessness.

Self-control as a personality trait describes the tendency to avoid acts whose negative long term consequences outweigh current advantages [27]. The general theory of crime proposes that engagement in criminal behaviour is caused by low self-control [28]. These findings are supported by research demonstrating that various criminal and imprudent behaviours can be attributed to low self-control [29]. A more recent investigation in a student sample even found that self-control is associated with the violation of rules [30]. Self-control can be argued to be synonymous with conscientiousness therefore since self-control is associated with violation of rules; it is likely that conscientiousness too will be associated with violation of rules.

On the whole, normlessness is another personality variable examined in non-compliance to road safety rules among motorcycle riders. An individual with normless attitude could be seen as having no conscientious attitude. Previous studies have found that low scores of conscientiousness and agreeableness, as well as high scores of sensation seeking and impulsiveness can contribute to various risky driving behaviours, including violations, driving errors, driving while intoxicated and their outcomes [31]-[36]. Although many studies succeeded in finding the relationship between these personality traits and driving behaviour, controversial results could be found as well. In some studies conscientiousness could not explain neither involvement which is vehicle accident [35], nor aggressive driving [32], or its value in prediction of risky driving was very weak [34]. Agreeableness failed to correlate with driving behaviour when the self-reported risky driving outcomes were analyzed or more sophisticated statistical procedures were employed [35], [37].

Empirical evidence in relation to the other Big Five personality traits is more inconclusive. Some studies revealed positive but mostly weak correlations between neuroticism [35], [37,], extraversion [38], [31], [35], [39], [40], openness to experience [38], [31,] and self-reported risky driving. However, many research results show no relationship between these variables, especially when more sophisticated statistical models are applied [38], [39], and [40]. There might be several reasons why the results in a field of non-compliance to safety rules personality are inconsistent. Reviewed studies differ significantly on assessment tools used [31] and analyzed dependent variables, such as lapses, errors and violations as measured by driver behaviour questionnaire, accident risk, accident involvement, and various compositions of the above. The use of simple statistics techniques like correlations or mean comparison may lead to invalid results due to interrelatedness among the big five traits being ignored [41].

Locus of Control and Road Safety Rules Compliance

Locus of control (LOC) is seen to be one of the most crucial psychological variables determining a

driver/motorcycle rider's compliance tendency towards road safety rules [42]. Therefore non-compliance with traffic rules by motorcycle riders could be attributed to personality trait of LOC among riders. However, due to diversity in research samples, a need arises to clearly understand the impact of LOC among motorcycle riders in different cultural contexts in order to foster improvement in compliance with road safety rules, hence this study.

LOC has been defined as a personality attribute reflecting the degree to which a person generally perceives events to be under their own control (i.e. internal locus of control), such as the belief that one's own ability, effort, or actions determine what happens, or under the control of powerful others or other outside forces (external locus of control) and the belief that fate, luck are responsible for what happens [43].

A study carried out indicates that personality traits such as locus of control are strong predictors of behavior [44]. In line with that, it is revealed through the findings that, external locus of control relates to a lack of caution and failure to take precautionary steps to avoid the occurrence of unfavourable outcomes [45], [46], [47]. Therefore, it has been hypothesized that, external locus of control might be related to less responsible driving and accidents which also relates to motorcycle riders. However, these researches have been mixed in their outcomes, it has been (1991) found in a study that a positive relationship exists between locus of control and reckless driving which result to an accident involvement [38], [48] while others found no direct relationship between locus of control and accidents [49]. In this vein, it has been also reported that risky driving was associated with emotional instability, and locus of control [50].

OBJECTIVES OF THE STUDY

The study aims at assessing influence of the big five personality traits and locus of control on road safety rules compliance among motorcycle riders in north-central Nigeria.

Specifically, the study sets out to; investigate if extraversion, agreeableness, conscientiousness, openness and neuroticism will jointly and significantly predict road safety rules compliance among motorcycle riders.

Secondly, to examine if extraversion, agreeableness, conscientiousness, openness and neuroticism will independently predict road safety rules compliance among motorcycle riders.

Thirdly, to investigate if locus of control will significantly predict road safety rules compliance among motorcycle riders.

MATERIALS AND METHODS

Researchers employed cross-sectional survey design in assessing the influence of the big-five personality traits and locus of control on road safety rules compliance among motorcycle riders in North-central Nigeria. The design was favoured because it can be used to assess information from different groups of people who differ in some ways, but share other characteristics such as the use of motorcycle.

Participants

Participants for this study were purposively drawn from the general population in North-central Nigeria. They were chosen based on the criteria that they use motorcycle. Selection was also based on their availability and acceptability to participate in the study. A total of 270 respondents who use motorcycle either for commercial, personal or both purposes were administered with the research instruments. From this number 264(97%) of the people completed and returned the survey instruments while 6(3%) did not.

From the 264 participants, 232 were males while 32 were females. 51 of them indicated that they use motorcycle for commercial purposes, 131 use it for private purposes while 40 use it for both private and commercial purposes. Also, 71 of the participants showed that they were married, 164 were single while 2 indicated they were separated from their spouses at the time of the research. Majority (185) of the participants surveyed were Tiv, the largest ethnic group in Benue State, 28 were Idoma, 6 were Igede while 45 of them were from other tribes in North-Central Nigeria. From the total sample, 75 had children while 189 indicated they had no children. The age range of the participants was between 15 and 60 years and the mean age was 27.19 years.

In terms of educational qualification, 110 of the participants completed basic education (primary and secondary school), 62 had Diploma or National Certificate of Education, 64 completed degree or Higher National Diploma, and 6 reported having master or doctor of philosophy degree. Meanwhile, 3 of the participants indicated they have not being to any formal school.

Similarly, 233 of the respondents were Christians, 11 of them were Muslims and 1 respondent reported practicing a religion other than the two. Just like in

education, 19 of them did not indicate their religious affiliations.

Instruments

The questionnaire consists of four parts. Part one assessed the demographic characteristics of the participants, part two was the Big Five Inventory (44 items) and it measured the personality traits of the participants. The Big Five Inventory (BFI) was designed to measure personality traits of extraversion agreeableness, conscientiousness, neuroticism and openness. A three month test-retest reliability score of .85. has been provided [51]. Also, BFI has a mean convergent validity coefficients of .75 and .85 with the Big Five Instruments authored [52], [53] respectively. In Nigeria, the divergent validity coefficients for the various sub-scales was obtained after correlating them, that is (BFI) with the University Maladjustment Scale [54], [55]. The following were obtained .05, .13, .11, and .39-24 for Extraversion, Agreeableness, Conscientiousness, Neuroticism and Openness respectively. In this study, Crombach's alpha produced a reliability coefficient of .84.

Part three was the Nowicki-Strickland Locus of Control Scale (N-SLCS). The 40-item scale was used to measure locus of control of the participants. The authors [56] reported a six-week interval test-retest reliability coefficient of .71. In addition, the concurrent validity coefficient of .25 was obtained by correlating N-SLCS with Index of Self-esteem developed [57], [58].

Part four of the questionnaire assessed road safety rules compliance. The 10-item scale was adopted from the Compliance with Safety Behaviour Scale (CSBs) developed [59]. It is a 5-point scale of Never =1 to Always =5. Sample item include "wear safety equipment as required by practice." The instrument has a Cronbach alpha of .88. Higher score implies higher or better compliance with road safety rules.

Procedure for Data Collection

The researchers made use of four research assistants during data collection for the study. The assistants were trained on the administration of the questionnaire. Two of them assisted in collecting data in Benue State while the other two collected data in Nasarawa and Plateau States, all of which are located in North-Central Nigeria. Attached to the research instruments was an informed consent form for the participants to willingly indicate (by signing) their acceptance to participate in the study after reading or listening to the assistants explain the purpose of the research to them. Those that accepted to take part in the study after signing the informed consent form completed the questionnaire and returned to either the research assistants or the researchers. At the end of the data collection, two hundred and sixty four participants duly completed and returned the questionnaire for statistical analysis.

Data Analysis

Statistical Package for Social Sciences, Version 16.0 was used to analyze the data collected in this study. In the package, descriptive statistics such as frequencies, mean and standard deviation were employed to summarize the characteristics of the respondents. Pearson's correlation was used to assess the inter-correlation among the major variables in the study while hierarchical regression was used to test the influence of the big five personality traits and locus of control on road safety rules compliance after controlling some demographic factors such as age, sex, educational status, religion and marital status of participants.

RESULTS AND DISCUSSION

The results for the study are as follows:

Table 1: Means, standard deviations, and inter-correlation among study variables

Variables	M	SD	1	2	3	4	5	6	7	8	9	10	11	12
1. RSRC	36.78	6.70	-											
2. Sex	0.08	0.28	0.05	-										
3. Age	27.19	7.16	0.02	-0.08	-									
4. Religion	1.05	0.24	-0.11	-0.06	0.21^{**}	-								
5. Education	2.84	0.91	0.17^{**}	-0.02	0.10	-0.05	-							
6. Marital status	1.71	0.47	-0.02	0.01	-0.50^{**}	-0.05	0.00	-						
7. Extraversion	27.26	5.78	0.08	0.01	0.07	0.07	0.03	-0.14^{*}	-					
8. Agreeableness	30.30	5.78	0.16^{*}	0.09	0.01	0.11	-0.00	-0.10	0.47^{**}	-				
9. Conscientiousness	28.78	6.07	0.15^{*}	0.07	0.06	-0.03	-0.02	-0.05	0.44^{**}	0.45^{**}	-			
10. Neuroticism	24.85	5.76	0.07	0.16	0.06	-0.04	0.01	-0.19^{**}	0.38^{**}	0.34^{**}	0.40^{**}	-		
11. Openness	36.67	7.23	0.22^{**}	0.05	-0.03	-0.12	0.14^{*}	-0.11	0.36^{**}	0.43^{**}	0.29^{**}	0.27^{**}	-	
12. Locus of control	25.00	5.92	-0.03	0.21^{**}	-0.00	-0.02	-0.16^{*}	0.05	0.24^{**}	0.21^{**}	0.18^{**}	0.22^{**}	0.14^{*}	-

Key : * = $p < 0.05$; ** = $p < .01$.

Table 2: Results of hierarchical regression

Variables	1	2	3
Sex	1.65	1.40	1.83
Age	0.03	0.05	0.06
Religion	0.07	-0.49	-0.29
Education	1.06*	1.05*	0.92
Marital status	-0.02	0.30	0.52
Extraversion		-0.07	-0.05
Agreeableness		0.30*	0.31*
Conscientiousness		0.09	0.08
Neuroticism		-0.14	-0.12
Openness		0.11	0.12
Locus of control			-0.12
R^2	0.03	0.11	0.11
R^2 Change	0.03	0.08	0.01
F-Change	$F_{(5,186)}$ =0.97	$F_{(5,181)}$ =3.32	$F_{(1,180)}$ =1.44
F-Value	$F_{(5,186)}$ =0.97	$F_{(10,181)}$ =2.18	$F_{(11,180)}$ =7.43

Note: * = $p < .05$.

The results of the analyses presented in table two revealed that jointly sex, age, religion, education, and marital status did not significantly predict road safety rules compliance (R^2= 0.03, $F_{(5, 186)}$ = 0.97; P>0.05). However, the variables accounted for 3% of the variance in road safety rules compliance among motorcycle riders in North-central Nigeria. Independently none of the 5 control variables tested was statistically significant except education (t= 1.95, P= 0.05, β= 1.06).

The results equally indicated that big five personality factors of extraversion, agreeableness, conscientiousness, neuroticism and openness jointly accounted for 8% of the variance in road safety rules compliance, far and above the control variables. In the regression equation model, extraversion, agreeableness, conscientiousness, neuroticism and openness statistically predict road safety rules compliance significantly (ΔR^2= 0.08, $F_{(5, 181)}$ = 3.32; P<0.01). This is consistent with hypothesis one that big five personality factors will jointly and significantly influenceroad safety rules compliance. Independently, extraversion, conscientiousness, neuroticism and openness did not significantly predict road safety rules compliance among motorcycle riders. The result is consistent with hypothesis two. Contrary with the hypothesis however, agreeableness significantly predict road safety rules compliance among motorcycle riders (t= 2.50, P< 0.05, β= 0.30).

Locus of control explained 1% of the variance in road safety rules compliance below the control variables and the big five personality factors. In the regression equation model, locus of control did not

significantly predict road safety rules compliance (ΔR^2= 0.01, $F_{(1, 180)}$ = 1.44; P>0.05). The result is not in line with hypothesis three.

Discussion

The influence of the big five personality traits and locus of control on road safety rules compliance among motorcycle riders in North-central Nigeria was investigated. In line with hypothesis one, result shows that extraversion, agreeableness, conscientiousness, neuroticism and openness jointly predicts road safety rules compliance significantly above and beyond the demographic characteristics of the participants assessed in the study. The result is supported by the fact that human behaviour is influenced by individual's personality that is often made up of a combination of traits. So the interaction of the big five traits can have a significant predictive value on road safety rules compliance

Result of the study also shows that extraversion personality trait did not independently predict road safety rules compliance significantly. The result implies that being an extrovert or an outgoing person does not translate into complying with road safety rules. In fact, some studies [38], [31], [35], [39], [60], [40] revealed positive (though weak) correlation between extraversion and self-reported risky driving. However, many research results show no relationship between these variables, especially when more sophisticated statistical models are applied [38], [39], [40]. Similar studies show that high levels of extraversion have been found to be positively related to risk taking behaviour and accident involvement [61], [62], [63]. From these results, it is clear that high levels of extraversion do not lead to rules compliance behavior but rather results to risky driving which involves violation of traffic rules.

Contrary to the stated hypothesis, agreeableness personality independently predicts road safety rules compliance. The result explains that individuals high on agreeableness trait comply with societal rules in general and road safety rules in particular. Moreover, people high on agreeableness personality trait are known to be softhearted and helpful and these characteristics translate into being 'good' and orderly on the road. The result is consistent with other researchers who found that people low in agreeableness tends not to follow rules by engaging in risky driving [31], [36], [32], [33], [34], [35].

The analysis also pointed out that conscientiousness independently did not predict road safety rules compliance among motorcycle riders.

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This result is in line with the hypothesis of the study although against many previous findings in this area. Previous investigators found that low scores on conscientiousness contribute to various risky driving behaviours, including violations such as driving while intoxicated [31], [32], [33], [34], [35], and [36].

The finding of this study can be explained in the context of Nigeria where the study was conducted. It is reported that over 100 million Nigerians live below the poverty line [64], therefore, it can be argued that many people that take to the use of motorcycles especially as a means of fending for themselves and their families neglect traffic rules in an attempt to maximise income each day.

The study hypothesised that neuroticism will not independently predict road safety rules compliance significantly. The analysis confirms this hypothesis that neuroticism is not a significant predictor of road safety rules compliance among motorcycle riders. The result is synonymous with other findings [24], [25], [26]. That neuroticism is not a predictor of road safety rules compliance rather it was found to be related to risky driving and rule breaking. Neurotic individuals are always anxious and unable to control impulses. In this light they tend to want to get to their destination in no time thereby disobeying traffic rules.

Result also shows that openness to experience did not independently predict road safety rules compliance. The result agrees with other investigators who found no relationship between these variables, especially when more sophisticated statistical models are applied [38], [39], [40]. Further studies even show that openness to experience accounts for self-reported risky driving [38], [31]. Individuals who are open to experience take risks, are curious and always want to try new things even on the road thereby violating traffic rules in the process.

Contrary to the assumption of the study, regression analysis shows that locus of control did not significantly predict road safety rules compliance. The result therefore implies LOC may even influence an individual's violation of traffic rules. And the result is in line with another report [48], that there is a positive relationship between locus of control and reckless driving which result to accident involvement. Similarly, the result agrees with that of another author's conclusion [50], that risky driving is associated with locus of control.

Implications/Recommendations of the findings

The results of this study have implications for improving road safety rules compliance among motorcycle riders in Nigeria. The study shows that individuals with extraversive, conscientious, neurotic and open personality traits do not comply with road safety rules. These findings call for proper licensing and personality profiling of motorcycle users. With these findings in mind also, the Federal Road Safety Corps and other related organisations in Nigeria should frequently organize special enlightenment seminars especially for individuals with these personality traits. This no doubt will facilitate road safety rules compliance and invariably reduce the rate of road crashes.

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