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Linking Personality Traits and Driving Behavior to Road Safety Outcomes: A Behavioral Framework for Urban Transport Systems

Arfan Bakhtiar, Anggun Rachmawati Wardani, Faradhina Azzahra, Manik Mahachandra*

Department of Industrial Engineering, Faculty of Engineering, Diponegoro University, 50275 Semarang, Indonesia

* Correspondence: Manik Mahachandra (manik.mahachandra@ft.undip.ac.id)

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Abstract: The rapid expansion of online motorcycle taxi services in Indonesia has been accompanied by a noticeable rise in traffic accidents, particularly in urban areas such as Semarang. In this context, driver-related factors appear to play a more decisive role than infrastructural conditions. This study examines the relationship between personality traits, driving behavior, and accident involvement among online motorcycle taxi drivers. Data were collected from 264 drivers and analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). The results show that honesty-humility, emotionality, agreeableness, conscientiousness, and openness to experience are associated with safer driving behavior, whereas extraversion is linked to riskier patterns. In turn, safer driving behavior is associated with a lower likelihood of accident involvement. By contrast, age and years of service do not show a consistent influence on driving behavior. Based on these findings, a set of behavior-oriented intervention strategies is outlined, with emphasis on aligning safety measures with individual personality profiles. Rather than focusing solely on regulatory enforcement, the results suggest that targeted behavioral approaches may offer a more effective pathway for reducing accident risk in urban motorcycle-based transport services.

Keywords: Behavior; Personality traits; Online motorcycle taxi driver; HEXACO model; Semarang

1 Introduction

World Health Organization (WHO) [1] makes an annual global report on road safety information from various countries, known as the "Global Status Report on Road Safety". It provides comprehensive statistical data on accidents, traffic, and injuries suffered by motor drivers in different countries. Placing ninth in 2004, the WHO [2] predicted that road accidents, as a leading cause of death, could continue to rise to fifth place in 2030 if optimal prevention and improvement efforts in various areas were not made. South-East Asia, including Indonesia, is the region with the second-highest accident rate after Africa. In Indonesia, the highest number of fatal death(s) accidents occurs among two-wheeled motorcycle users. Several points of the road safety regulations for motorcycle drivers compiled by the WHO have not been strictly implemented in Indonesia.

The need for efficiency has driven innovation in transportation technology, as seen in the emergence of online transportation services like motorbike taxis, which customers can conveniently access and utilize through their mobile phones. However, as online motorcycle taxis increased, the number of motorized vehicles and accidents has also increased in Indonesia, including Central Java. Based on the Minister of Transportation data, there were 58,715 cases of online motorcycle taxi driver accidents in Central Java in 2017 (79% of all traffic accident cases) [3]. The significant number of accidents highlights the need for further research on this case.

The author's preliminary study on online motorcycle taxi drivers in Semarang, the capital city of Central Java, supports the statement above. The study involved 15 respondents who were interviewed regarding accidents they had experienced while working as online motorcycle taxi drivers. All respondents reported having encountered incidents where they fell off their motorcycles or collided with other vehicles. These findings lay the groundwork for the present study. This result was also supported by Adi Pratama and Koesyanto [3], who examined online motorcycle taxi drivers in Semarang city regarding the analysis of accident risk factors. In the preliminary study conducted, it was found that 100% of the samples also stated that they had committed traffic violations and/or were involved in accidents while working as online motorcycle taxi drivers.

Numerous studies have examined the factors contributing to accidents involving online motorcycle taxi drivers. According to the former Director General of Land Transportation, Pudji Hartanto, the main factors contributing to road safety are the skills and personalities on the road and the driver's behavior [4]. Muin and Rohmah [5] found that there is a relationship between driving awareness of online motorcycle taxi drivers and work accidents. Similarly, earlier research by Pourmazaherian et al. [6] emphasized the critical role of human factors and human error in accident causation. These studies concluded that improving attitudes and modifying behaviors could substantially reduce human error and its contribution to traffic incidents.

Several other studies have explored the relationship between driver behavior and personality traits. For instance, Ismail and Halim [7] investigated the correlation between personality characteristics and driving behavior in road accidents among bus drivers in Riau, Indonesia. Their study utilized the Big Five Personality assessment, the Driver Behavior Questionnaire, and the Road Accident Inventory to evaluate these dynamics.

Building on insights from prior research, this study aims to inform policy recommendations to reduce accidents involving online motorcycle taxi drivers. To do so, it explores the link between personality traits and driving behavior. The personality structure adopted in this study is based on the HEXACO model, which incorporates six major personality dimensions [8, 9]. Compared to the Big Five Personality assessment, the most crucial difference lies in the sixth personality dimension, which is Honesty-Humility. Individuals with low Honesty-Humility tend to disregard rules and social norms, engaging in high-risk behaviors, unethical conduct, and bold actions. In contrast, those with high Honesty-Humility are more altruistic, disapprove of cheating and stealing, have little interest in luxury, and do not seek special treatment [10]. The Honesty-Humility personality trait is particularly relevant to motorcycle taxi drivers. Honesty-Humility is associated with a reduction in counterproductive work behaviors, especially when job insecurity is a factor [11]. Counterproductive behaviors in a formal organization are characterized as voluntary actions that contravene significant organizational rules, hence undermining the welfare of both the organization and its members. For individuals with low Honesty–Humility, job uncertainty was strongly correlated with counterproductive work behaviors; conversely, for those with high Honesty–Humility, job insecurity was found to be unrelated to such behaviors [11]. Motorcycle taxi drivers, they often deal with unpredictable job conditions and income instability that is related to job insecurity. With low Honesty-Humility, motorcycle taxi drivers might have counterproductive actions that involve actions that undermine safety. Therefore, this study uses the HEXACO model to assess the personalities of motorcycle taxi drivers.

In terms of driving behavior, previous studies have commonly assessed two to four dimensions, such as traffic violations and speeding [12] or violations, aggressive tendencies, errors, and lapses [7]. However, this study adopts a more comprehensive approach by applying six behavior dimensions tailored specifically for motorcycle drivers in the Indonesian context. The categories include traffic errors, control errors, speed violations, traffic violations, safety violations, and stunt behaviors, derived from the Motorcycle Rider Behavior Questionnaire (MRBQ), which has been adapted to reflect conditions specific to Indonesia [13].

Finally, this study aims to develop a Change Behavior Technique framework. The proposed framework will be based on an analysis of the interrelationships among driver personality traits, driving behavior, demographic characteristics, and prior accident experience. The resulting recommendations are intended to support initiatives aimed at reducing traffic accidents involving online motorcycle taxi drivers in Semarang, Indonesia.

2 Methodology

2.1 Participants

Data were collected through an online survey distributed via Google Forms and disseminated randomly among online motorcycle taxi drivers using a purposive sampling approach. To reduce potential bias, inclusion and exclusion criteria were applied. Participants were required to reside in the Semarang region and have a minimum of one year of experience working as an online motorcycle taxi driver as their primary occupation. Exclusion criteria included incomplete responses and answers deemed irrational or inconsistent with the survey's logic.

The questionnaire was self-administered and anonymous. A total of 264 submitted forms were collected, and none were excluded (response rate 100%). The participants, with an average age of 34.19 ± 9.26 years, included 255 males and 9 females, reflecting the reality that the number of female drivers is lower than that of male drivers. All participants provided their consent to be part of this study.

2.2 Data Collection

2.2.1 Personality assessment: Brief HEXACO inventory

It is commonly agreed that personality is defined as patterns of certain traits and characteristics inherent and consistent within an individual that serve to distinguish the individual from others. Personality refers to the idiosyncrasies of an individual, i.e., the tendencies to behave, think, or feel conceptually across relevant situations and over a long period, particular to a person.

The personality assessment in this study employed the Brief HEXACO Inventory (BHI), which was based on the adaptation by Ashton and Lee [8] and de Vries [9]. This questionnaire has been employed in several cross-cultural studies, including those in Southeast Asia. While a full validation study for the Indonesian population has not yet been widely published, this research relied on the version that had undergone translation, back-translation, and pilot testing to ensure linguistic and contextual appropriateness for Indonesian participants. Moreover, the decision to use the BHI was also informed by its brevity, which reduces respondent fatigue in online survey formats, while maintaining acceptable psychometric properties in prior international studies.

The BHI assessed the six dimensions of personality, each consisting of 4 items, for a total of 24 items. This questionnaire applied a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) [9, 14, 15]. The six dimensions of personality used as a basis for assessment in this study are as follows.

(1) Honesty-Humility: High scorers tend to avoid manipulating others for personal gain, infrequently violate rules, are not interested in only pursuing wealth and luxury, and do not differentiate or discriminate against individuals based on their social status.

(2) Emotionality: High scorers tend to be sensitive to physical risks and dangers, experience anxiety in response to life's pressures, have a need for emotional support from others, and feel empathy and sentimental attachment to others.

(3) Extraversion: High scorers maintain a positive outlook, enjoy gatherings and social interactions, experience feelings of enthusiasm, and are full of energy.

(4) Agreeableness: High scorers are forgiving of errors, subtle in judging others, willing to compromise and cooperate with others, and can easily control their emotions.

(5) Conscientiousness: High scorers tend to be disciplined, perform tasks accurately, exercise caution in making decisions, and are diligent in managing time.

(6) Openness to Experience: High scorers are easily amazed by the beauty of art and nature, have a high curiosity in various fields of knowledge, use their imaginations freely in everyday life, and show interest in ideas uncommon to most individuals.

2.2.2 Behavioral assessment: Motorcycle Rider Behavior Questionnaire

This research employed six attributes of assessment as the basis for understanding the driving behavior among motorcyclists, aiming to observe and identify which habits of online motorcycle drivers are likely to cause accidents. Six attributes were assessed using the MRBQ, tailored to the specific conditions in Indonesia [16, 17]. The MRBQ questionnaire had 38 items and applied a six-point Likert scale ranging from 1 (never) to 6 (always) [18–20]. The six attributes incorporated in the questionnaire were as follows.

(1) Traffic Errors: About traffic mistakes made by motorcyclists (i.e., mistakes that are made unintentionally).

(2) Control Errors: About mistakes or oversight in controlling a motorbike (while driving).

(3) Speed Violations: About the tendency to violate speed rules while driving.

(4) Traffic Violations: About the tendency to commit traffic violations.

(5) Safety Violations: About the tendency to violate safety rules when driving a motorcycle.

(6) Stunts: About an inclination toward risk-induced exhilaration through stunt acts, thereby violating safety rules while driving.

2.2.3 Respondent profile

The collected respondent profiles in this study included age, years of service, and accident history. The age data is the number of years a person has lived since birth. The years of service data is the long period of a respondent working as an online motorcycle taxi driver. The respondents were asked whether they had worked less than or more than one year (365 days). The accident history is the accident experience experienced by the driver. The accident experiences, based on participation, can be categorized into two: active and passive accidents. The questions entailed whether the driver had taken the role in an accident (collision) involving and imposed on another vehicle (active) or object; or had they been subjected to an accident by another vehicle (passive) while working as an online motorcycle taxi driver. The survey employed the Guttman scale to assess a driver's involvement in different cases of accidents while working as an online motorcycle taxi driver (whereby 1 = yes, 0 = never) [21].

2.3 Conceptual Framework

This research analysed the relationship between HEXACO personality traits, years of service, the age of motorcycle taxi drivers, and their driving behaviours on the road, pertaining to road accidents [7, 12]. Figure 1 shows the model of this research. Conscientiousness and extraversion were correlated with safe driving behavior, as concluded by Herzberg [22]. Extraversion and agreeableness were correlated with risky driving behavior, as stated by Ulleberg and Rundmo [23]. Openness to experience, on the other hand, was positively correlated with safe traffic behavior, especially in preventing violations. Honesty-humility and emotionality were shown strong correlation with risky driving behavior.

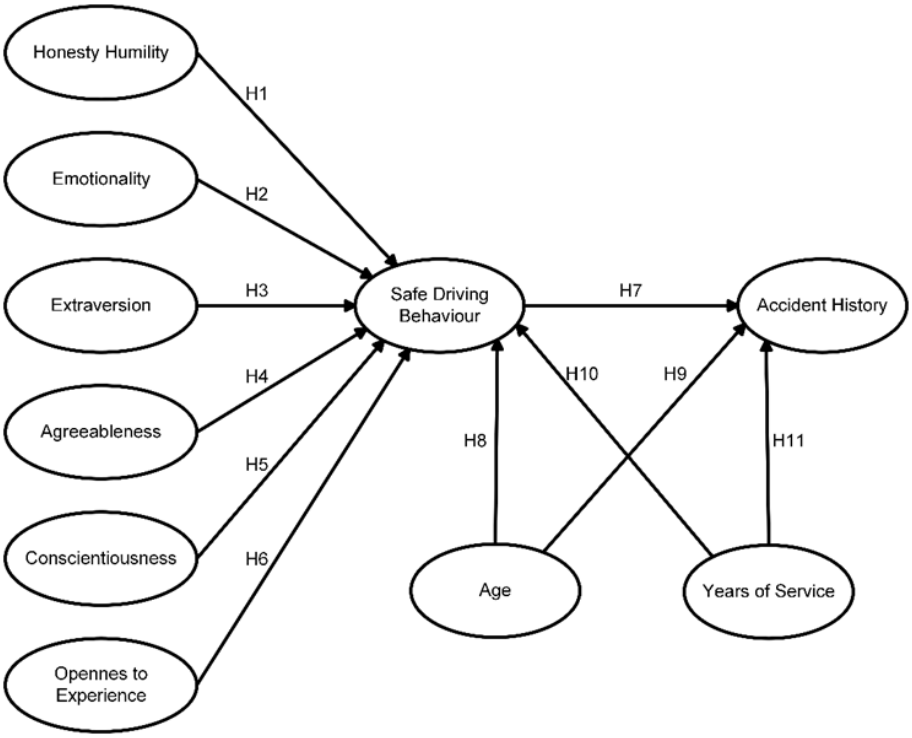

Figure 1. Research model

The analysis approaches used in this research included descriptive analysis for all variables, evaluation of the measurement model (outer model), evaluation of the inner model (R^2, Predictive relevance, effect size, Standardized Root Mean Square Residual (SRMR), and Normed Fit Index (NFI)), and hypothesis test using the partial least squares structural equation modelling (PLS-SEM) method in SmartPLS 3.2.9.

The hypotheses are as follows:

H1: Honesty-humility is significantly and positively correlate with safe driving behavior.
H2: Emotionality is significantly and positively correlate with safe driving behavior.
H3: Extraversion is significantly and positively correlate with safe driving behavior.
H4: Agreeableness is significantly and positively correlate with safe driving behavior.
H5: Conscientiousness is significantly and positively correlate with safe driving behavior.
H6: Openness to experience is significantly and positively correlate with safe driving behavior.
H7: Safe driving behavior is significantly and positively correlate with accident history.
H8: Age is significantly and positively correlate with safe driving behavior.
H9: Age is significantly and positively correlate with accident history.
H10: Years of service is significantly and positively correlate with safe driving behavior.
H11: Years of service is significantly and positively correlate with accident history.

3 Results

The HEXACO personality traits analysis of the online motorcycle taxi drivers in Semarang shows a tendency towards honesty-humility that is not particularly low or evenly distributed, which is 55% compared to 45% had a low honesty-humility trait. Additionally, 65% had a low emotionality trait, 68% had a high extraversion, 65% were low in agreeableness, and 68% exhibited low openness to experience. Based on the analysis of safe driving behavior measured using MRBQ, online motorcycle taxi drivers in Semarang generally demonstrated low safe driving behavior. Based on the results, 72% of all participants had made or committed traffic errors, vehicle control errors, speed violations, and safety violations; 78% of them had committed traffic violations, and 67% had done stunt acts while driving. Regarding accident history, as many as 70% of respondents reported having experienced an accident, while the rest did not.

The assessment measure results were then analyzed for relationships using SEM (Figure 2). The Honesty-Humility variable was shown to significantly and positively affect the Driving Behavior variable (original sample 0.218; t-statistic $>$ 1.960; p-value $<$ 0.05; f^2 = 0.096). Thus, the first hypothesis is accepted. Drivers with a high level of honesty-humility trait will tend to act with more honesty, sincerity, and politeness, whereas those with a low

score do not and tend to be greedy. It applies that the higher the score of honesty-humility, the safer the driving behavior will be. This aligns with a study showing that individuals with a high honesty-humility trait feel more bound by rules and restrictions that distinguish them from drivers with low honesty-humility, who are likelier to violate laws and norms [10]. The honesty-humility trait reported by the respondents could generally be associated with an increased inclination toward a certain positive risk-taking attitude. That is, a risk-taking decision is considered positive when made in a bargain for potential gains and to avoid potential losses.

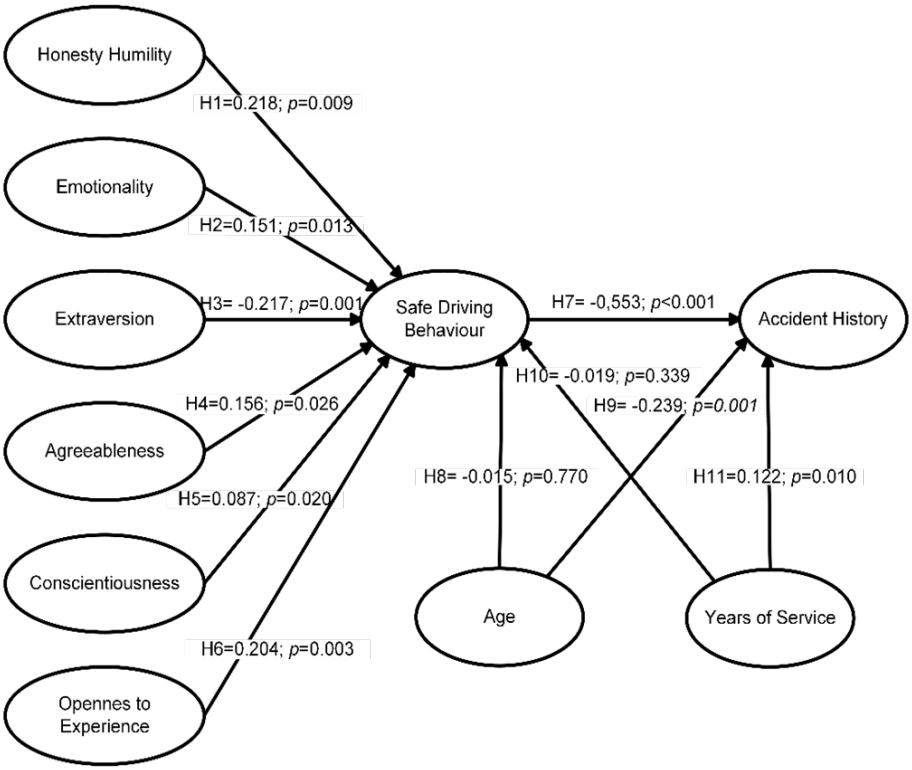

Figure 2. Research results

The results of the SEM analysis in Figure 2 also showed a significant positive relationship between Emotionality and Driving Behavior (original sample 2.472; t-statistic $>$ 1.960; p-value $<$ 0.05; f^2 = 0.035). Thus, the second hypothesis is accepted. Drivers with a high level of emotionality trait are easily afraid, anxious, agitated, offended, less independent, and sentimental. This propensity carries over to their driving behavior, which, comparatively, tends to be more careful. This study's results differ from the study of Lucidi et al. [24], who found that individuals with high emotionality tend to make errors and lapses often while driving. They elaborated that other previous studies found that an anxious driving style tends to result in many driving errors [25] and are more likely to be involved in accidents [26]. Azzahra and Wijayanto [27] found different things, negative emotions can actually reduce driving performance, but negative emotions increase the driver's situation awareness (SA), especially SA level 1. This might happen because negative emotions can induce the sympathetic nervous system (SNS), which then increases readiness [28]. An increase in SA level 1 indicates an increase in driver identification ability, and an increase in readiness may indicate an increase in driving behavior.

Further analysis from Figure 2 showed a significant negative relationship between Extraversion and Driving Behavior (original sample -0.217; t-statistic $>$ 1.960; p-value $<$ 0.05; f^2 = 0.090). Therefore, the third hypothesis is rejected. Drivers with lower levels of extraversion tend to engage in safer driving behavior. This is consistent with existing literature, which identifies excitement-seeking and sociability—core facets of extraversion—as predictors of risky driving tendencies. Highly extraverted individuals are more likely to seek stimulation and novelty, which can manifest as speeding, overtaking, or violating traffic rules to satisfy arousal needs [29]. These behaviors are often driven by risk-seeking tendencies and impulsivity, traits that have been strongly associated with accident-prone driving patterns in prior researches [30–32]. Conversely, individuals low in extraversion are typically more reserved, cautious, and deliberate—traits that align with rule-abiding and disciplined driving behavior. Thus, the observed negative relationship may reflect the protective role of low extraversion against impulsive or thrill-seeking behavior on the road.

The results of the SEM analysis (Figure 2) also showed a significant positive relationship between agreeableness

and driving behavior (original sample 0.156; t-statistic > 1.960; p-value < 0.05; $f^2 = 0.033$). As such, the fourth hypothesis is accepted. Drivers with a high level of agreeableness are easy to forgive, calm, flexible, and patient; i.e., agreeableness can positively influence driving behavior. These results agree with previous research [10, 33, 34]. Hussain et al. [35] found that individuals with a low tendency to agreeableness commit aggressive violations and errors while driving, causing danger to other motor drivers while on the road. Conversely, if the person has a high level of agreeableness, the person is more likely to behave safely.

The results of the SEM analysis in Figure 2 showed that conscientiousness has a significant positive effect on driving behavior (original sample 0.087; t-statistic > 1.960; p-value < 0.05; $f^2 = 0.025$). Therefore, the fifth hypothesis is accepted. Drivers with a high conscientiousness score present organized, diligent, perfectionist, and wise traits that have a good influence on driving behavior. This result aligns with a study conducted by Hussain et al. [35] which found that drivers with low conscientiousness are more likely to make errors and violations when driving on the road. Arthur and Graziano relate the conscientiousness variable to a person's perfectionist nature. If someone has a high level of conscientiousness, they are likely to be a perfectionist and are organized in driving, therefore, less likely to endanger other road users and passengers [30].

SEM analysis in Figure 2 shows a significant positive relationship between openness to experience and driving behavior variables (original sample 0.204; t-statistic > 1.960; p-value < 0.05; $f^2 = 0.066$). Thus, hypothesis six is accepted. Drivers with a high level of Openness to Experience are always curious and want to try new things. Thus, they have broader insights, which in turn have a positive influence on driving behavior to a significant extent. This relationship, again, concurs with the report by Haerani et al. [12], which revealed that individuals with high openness tend to behave safely and drive carefully and rarely commit traffic violations.

Between driving behavior and accident history, it was found that the former has a significant negative effect on the latter (original sample -0.553; t-statistic > 1.960; p-value < 0.05; $f^2 = 0.333$). That is, the SEM analysis rejected the seventh hypothesis. This would mean that the higher the tendency toward safe driving behavior, i.e., a high score in measurement, the lower the Accident History score, i.e., involvement in accidents. This is in line with previous research, whereby drivers with safe driving behavior will tend to have a high level of alertness, which can prevent mistakes and lower the number of accidents [36].

The SEM analysis in Figure 2 also showed a negative, but insignificant, relationship between age and driving behavior (original sample -0.015; t-statistic 0.293; p-value 0.770; $f^2 = 0.001$). Thus, hypothesis eight is rejected. This finding differs from previous studies, which suggested that age affects a person's level of maturity when driving and, consequently, influences driving behavior [37, 38]. This is also said to be true on the premise that age is strongly related to age-related health conditions. Whereas in this study, a driver's age was not shown to determine driving behavior, which is to say that age does not affect maturity level.

A significant negative relationship between age and accident history (original sample -0.239; t-statistic > 1.960; p-value < 0.05; $f^2 = 0.062$) was shown by the SEM analysis. Therefore, hypothesis nine is accepted. The higher the driver's age, the lower the accident history measurement score. This hypothesis test result corresponds to the research conducted by Sayed et al. [39], which revealed that young(er) drivers typically demonstrate a higher tendency for accidents. This finding is also supported by Varina and Mahachandra [40], in which it was found that young drivers are liable to accidents. Likewise, the years of service/experience, though insignificant, have a negative effect on driving behavior (original sample -0.019; t-statistic 0.956; p-value 0.339). Thus, hypothesis ten is also rejected. This result is aligned with previous research that has reported no relationship between the length of service and safe driving behavior in drivers [41]. In other words, a long experience as a driver does not necessarily equate to good driving behavior.

Lastly, the analysis showed a significant positive relationship between years of service and accident history (original sample 0.122; t-statistic > 1.960; p-value < 0.05; $f^2 = 0.033$). Thus, the eleventh hypothesis is accepted. Drivers with a longer working period have a higher accident history score. This is in accordance with previous research in Indonesia who found that though drivers with long working years tend to have a better understanding and familiarity of routes and their constitutive environments, they will have a higher rate of accidents that they have experienced due to the more extended exposure (to risks), as with any work experience, than other drivers who have just started working [3].

This study has several limitations. First, the respondents were limited to online motorcycle taxi drivers, excluding drivers of other vehicle types; this was intentional to focus on behavioral characteristics specific to motorcycle use. Second, the study was geographically confined to Semarang City, chosen due to its high number of motorcycle users, traffic accidents, and online drivers, but this limits generalizability to other regions. Third, the measurement tools were restricted to the BHI [42] and the Indonesian MRBQ [16, 17], which may not fully capture the complexity of the constructs. Fourth, the number of male and female respondents was imbalanced. Additionally, data collection relied solely on self-reported questionnaires without direct observation, which could reduce the objectivity of the behavioral assessment. Finally, the validity of responses depends on the honesty and self-awareness of participants, raising the potential for social desirability bias or misinterpretation of questions.

Building on the limitations of the current study, several opportunities for future research are recommended. First, expanding the scope to include online drivers of other vehicle types, e.g., cars, would allow for comparative analyses across different modes of transport. Second, conducting multi-city or cross-regional studies could improve the generalizability of findings and provide insight into contextual factors affecting driving behavior. Third, the use of more comprehensive personality and behavioral assessment tools may yield richer data and capture additional influencing variables beyond those covered by the BHI and MRBQ. Fourth, while the majority of online motorcycle taxi drivers in Indonesia are male, it is important to recognize that the limited data on female drivers may restrict the findings, underscoring the need for further research to explore women's experiences more thoroughly. In addition, future studies could incorporate multi-method approaches, such as direct behavioral observation, in-vehicle monitoring, or interviews, to complement self-reported data and increase validity. Including additional variables—such as risk perception, fatigue, or stress—may also deepen the understanding of factors influencing driving behavior. Lastly, longitudinal designs could be employed to track changes in personality traits, driving habits, and accident involvement over time, providing a more dynamic view of how these elements interact in real-world settings.

4 Discussion

Based on the SEM result, we can conclude that the personality of Honesty-Humility, Emotionality, Agreeableness, Conscientiousness, and Openness to Experience has a significant positive relationship with Safe Driving Behaviour, and the personality of Extraversion has a significant negative relationship with Safe Driving Behaviour. Safe Driving Behavior has a significant negative relation with Accident History.

Based on the analysis above, we composed suggestions for improvement for further research, which are to build recommendations using the Behavioral Change Technique method, Fylan [43] using ten groups and a total of 20 technical recommendation items that can be applied to online motorcycle taxi drivers. BCT was built and continues to be developed by Michie et al. [44]. BCT enables interventions to be assessed for effectiveness in achieving the desired behavior change. An intervention involves taking action to modify someone's life or environment in order to bring about a change. Intervention is expected to change some aspects of a person or environment to produce better behavioral results.

While no direct linkage exists between HEXACO traits and the specific behavior change techniques proposed by Doggett et al. [45], the CBT framework can be assigned based on the personality traits of each online motorcycle taxi driver as follows:

(1) Honesty–Humility aligns with techniques emphasizing commitment, rule-following, contract-signing, or norm-based pledges.

(2) Conscientiousness supports structured, goal-oriented change methods: goal setting, planning, monitoring, and self-feedback loops.

(3) Emotionality suggests emotional framing, empathy-based messaging, or stress-buffering interventions may resonate better with those high in this trait.

(4) Agreeableness, extraversion, and openness indicate receptivity to collaborative, social, creative, or novelty-based interventions.

Therefore, based on the value of each personality trait performed by participants, the behavior change management can be assigned as the following strategies:

(1) Low Honesty-Humility, with a median value of 2 (interquartile range (IQR) 1–4)

Low honesty-humility drivers tend to engage in dishonest practice while driving. Therefore, to minimize the negative attitude, the company may apply an incentive-based strategy, as proposed by Kerényi [46], to set a goal and plan. As for providing feedback and monitoring, the company can install a GPS-based behavior monitoring application.

(2) Low Emotionality (Mdn 2, IQR 1–4)

Drivers with low emotionality usually do not show a reactive response to any circumstances; they tend to be calm and confident. To support the drivers, the company may facilitate the feedback system by adding a customer review feature. In addition, to maintain the driver community positivity, the company may add a leaderboard system, as proposed in the "follow the leader" approach by Hong et al. [47].

(3) High Extraversion (Mdn 4, IQR 2–5)

Drivers with high extraversion tend to have high self-esteem and confidence levels, maintain positive thinking, and enjoy social interactions. The company can provide and support any job-based community. One example in Indonesia, there is an online driver community called Asosiasi Driver Online (ADO), which has been established since 2016.

(4) Low Agreeableness (Mdn 2, IQR 1–4)

Drivers with low agreeableness tend to display less pro-social behavior; they tend to be more focused on their own needs, even when these conflict with the interests of others. Their peers may therefore view this type of driver

as somewhat selfish in their behavior, but the company can try to respond to this behavior by giving them an outlet to express their opinion. One best practice in Indonesia is that the driver can also give a rating and a remark to the customer after each service.

(5) Low Conscientiousness (Mdn 2, IQR 1–4)

A driver with low conscientiousness might be more impulsive and spontaneous, even reckless. However, they are easygoing and may often be late or sloppy, partly because they are not strongly focused on future goals for success and not highly concerned with obeying all rules and staying on schedule. Even though online drivers usually have irregular working schedules, the company may need to minimize the negative consequences by applying a structured plan of activity using a gamified approach, as proposed by Stephens [48].

(6) Low Openness to Experience (Mdn 2, IQR 1–4)

Online drivers with low openness to experience tend to enjoy more regular activities than exploring new experiences. In one way, these regular practices may form positive behavior all the time. Therefore, the company might encourage this behavior through structured and regular training [49].

5 Conclusions

This study examined the relationship between the HEXACO personality traits and driving behavior among online motorcycle taxi drivers in Semarang. The findings revealed generally low levels of safe driving behavior, with high occurrences of traffic violations, stunt acts, and accident history. The SEM analysis confirmed that five of the six HEXACO traits—Honesty-Humility, Emotionality, Agreeableness, Conscientiousness, and Openness to Experience—had a significant positive influence on safe driving behavior. Conversely, Extraversion was negatively associated with driving safety, indicating that lower extraversion correlates with safer driving patterns.

Further analysis indicated that safe driving behavior significantly reduces accident history, while age inversely relates to accident involvement. However, age and years of service did not significantly influence driving behavior, and longer work experience was associated with a higher incidence of accidents—likely due to increased exposure over time.

Although no direct linkage exists between HEXACO traits and the behavior change techniques, this study suggests that a personality-based behavior change framework can be effectively applied. For instance, drivers high in Honesty-Humility may benefit from norm-based commitments, while those high in Conscientiousness may respond well to structured goal-setting interventions. Emotionality, Agreeableness, Extraversion, and Openness can guide the tailoring of empathetic, social, or creative behavior-change strategies. In conclusion, aligning behavioral change interventions with personality profiles offers a promising direction for improving road safety and reducing accident rates among online motorcycle taxi drivers in Indonesia.

Author Contributions

Conceptualization, A.B. and A.R.W.; methodology, M.M.; software, A.R.W.; validation, A.B., M.M., and F.A.; formal analysis, A.B., M.M., and F.A.; investigation, F.A.; resources, A.R.W.; data curation, A.R.W.; writing—original draft preparation, A.R.W.; writing—review and editing, A.B., M.M., and F.A.; visualization, F.A.; supervision, A.B.; project administration, M.M.; funding acquisition, F.A. All authors have read and agreed to the published version of the manuscript.

Informed Consent Statement

Informed consent was obtained from all subjects involved in the study.

Data Availability

The data used to support the research findings are available from the corresponding author upon request.

Conflicts of Interest

The authors declare no conflict of interest.

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Appendix

Code	Description	Q1	Q2	Q3
HH1	Sincerity	1	2	4
HH2	Fairness	1	2	4
HH3	Greed Avoidance	1	3	4
HH4	Modesty	1	2	4
Var HH	Honesty-Humility	1	2	4
EM1	Fearfulness	1	1	4
EM2	Anxiety	1	2	4
EM3	Dependence	2	2	4
EM4	Sentimentality	1	2	4
Var EM	Emotionality	1	2	4
EX1	Social Self-esteem	2	4	5
EX2	Social Boldness	3	4	5
EX3	Sociability	2	4	5
EX4	Liveliness	2	4	5
Var EX	Extraversion	2	4	5
AG1	Forgiveness	1	2	4
AG2	Gentleness	1	2	4
AG3	Flexibility	1	2	4
AG4	Patience	1	2	4
Var AG	Agreeableness	1	2	4
CO1	Organization	1	2	4
CO2	Diligence	1	2	3
CO3	Perfectionism	1	2	4
CO4	Prudence	1	1	2
Var CO	Conscientiousness	1	2	4
OP1	Aesthetic Appreciation	1	2	4
OP2	Inquisitiveness	1	2	4
OP3	Creativity	1	2	4
OP4	Unconventionality	1	2	4
Var OP	Openness to Experience	1	2	4

Note: Scales' description: 1 (strongly disagree), 2 (disagree), 3 (not disagree nor agree), 4 (agree), 5 (strongly agree)