Accidents while working in the construction industry source many tangible and intangible losses. Although various measures have been taken to reduce occupational accidents in the construction sector, occupational accidents are still increasing, especially in Indonesia. Meanwhile there is some literature on the relationship between personality traits and accidents, much remains to be considered before applying the research to accident prevention. Therefore, there is a need to study in detail the correlations between the Big 5 characteristics and safety behaviors, including other variables, so that preventive action can be taken as a form of occupational injury prevention. The purpose of this study was to analyze the impact of the Big 5 personality traits, using personal values and safety culture as variables influencing safety behavior in construction workers. This study analyzes or resolves not only the direct impact of Big 5 personality traits on safety behavior of construction workers, but also the indirect impact through personal values and safety culture. Data were collected through interviews with 300 construction workers in Surabaya, Malang and Batu, East Java, Indonesia. The results showed that the Big 5 personality had a significant positive impact on workplace safety behavior with a difference of 0.299. In addition, personal values and safety culture as intervention variables may influence the impact of Big 5 personality traits on workers' safety behavior. The 0.788 and 0.545 Big 5 personalities have a significant impact on personal values and safety culture. One of the dominant indicators when measuring the Big 5 personality structure is neuroticism, with the highest stress factor of 0.928. Therefore, if management wants to improve worker safety behavior, it should conduct a workplace analysis to hire competent workers with a high degree of neuroticism

Keywords: big five personality, safety culture, personal values, worker safety behavior, SEM-PLS

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ANALYSIS OF THE ROLE OF BIG FIVE PERSONALITY THROUCH WORKER'S SAFETY CULTURE AND PERSONAL VALUE AS INTERVENING VARIABLE ON CONSTRUCTION WORKERS' SAFETY BEHAVIOR USING SEM-PLS

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1. Introduction

Workplace accidents are defined as an abrupt or unanticipated incident that causes to an injury. Work accidents are a dispute in the construction industry, and the number of occupational accidents is on the rise. These accidents affect not only individual workers, but also the management, government and environment [1].

According to ILO in 2017, the number of worker fatalities and occupational diseases worldwide increased from 2.3 million to about 2.78 million. Additionally, there are approximately 374 million non-fatal work-related injuries and illnesses worldwide each year, many of which lead to absenteeism. As such incidents increase in the workplace, so does the financial burden. Combined costs of illness, injury and death amounted to 3.94 % of global GDP, or 2.99 trillion USD [2].

Meanwhile, based on [3], has been increasing for the past five years. There will be 234,370 occupational accidents in 2021. Although there are no specific statistics on the number of accidents in the construction sector, the sector is the leading cause of occupational injuries. As per [4], construction job accidents account for 30 % of all workplace accidents. Construction is one of the industries with the greatest possible risk of injury and death related to work accidents.

Frontline worker unsafe behavior is seen as a direct and essential contributor to workplace injuries and accidents in a variety of high-risk sectors or industries. The significant causes of occupational accidents on construction projects are related to the unique characteristics of construction projects, different work sites, exposed and weather-influenced project sites, limited working hours, high demands on physical endurance and dynamism, and the use of untrained labor. However, there are differences between occupational safety perceptions and behaviors in the case of occupational accidents at construction work-sites [5]. This is due to the mobile nature of construction sites, making it difficult to control the overall conditions of construction sites. As a

consequence, it is essential to identify and comprehend the factors that determine disparities in individual safety behaviour, also its relationships. According to [6], workplace accidents can be evolved by a combination of various factors. Individual factors are the main factors influencing workplace safety behavior and organizational factors. [7] argues that work safety is a state of being intact and secured from adversity, harms, and loss in the workplace, both in the use of tools, materials and machinery in the manufacturing process and in the maintenance and security of the workplace and environment. claims. According to [8], safe behavior supports safe practices and safety activities in the workplace, and workers must accept both as job requirements to avoid workplace accidents. Furthermore, [9] states that the major personal or human factors are work attitudes and motivation. Below is a list of each error:

1) unknown ergonomic hazard;
2) worst managerial safety behavior;
3) improper worker selection;
4) short-sighted worker training.

Therefore, research that addresses the impact of Big 5 personality traits on construction worker safety behavior through personal values and safety culture is of scientific relevance.

2. Literature review and problem statement

Several studies have drafted out to find a proper model related to work safety behavior. Work safety modelling is expected to improve work safety performance itself and reduce work accidents in construction industry. Behavioural factors are human aspects, and these factors pay less attention than environmental factors. Behaviour is an activity displayed by a person which can be observed directly or indirectly. There are four effective factors to improve safety behaviour: safety states, employee engagement, safety knowledge, also safety management systems and procedures. Safety climate factors have large impact on safety behaviour. Therefore, a combined safety climate with other factors strategy are needed to maximize safety behaviour and achieve a total safety culture [10]. Safety behaviour is an action or activity related to work safety factors. [11] stated that by analyzing safety behavior factors, construction accidents can be prevented and integrated long-term planning can be developed. However, the causes of such accidents are mainly studied based on phenomena such as lack of safety equipment, lack of safety education, and worker's inaccuracy. Furthermore, this study showed that organizational and personal factors, such as job stress, personal characteristics, and self-perceived fatigue, influence safety behavior in statistically significant ways. There's a way to overcomes this adversity is to develop a structural model of safety behavior further that considers both personal and organizational factors arising from job classifications.

Safety behavior, also called safe behavior according to Heinrich in [12], is behavior carried out by several people that can minimize the occurrence of work accidents in all employees. [12] emphasizes the essential to acknowledge worker training, worker attitudes, and management practices when prevention efforts are contemplated. Accident scenarios are useful for analyzing events, such as whether dangerous situations or actions exist or are underway, how workers react to or are affected by those events. The website indicated is a logical way to identify the root cause of accidents at construction sites. But how significant this unsafe acts or behavior effecting works accidents or safety behavior still not recognized. Therefore, it is necessary to analyze how significant worker behavior influencing safety behavior.

The research conducted by [13] results indicate that job stress negatively affects safety behaviors related to safety compliance, and emotional intelligence positively influences safety behaviors related to safety participation and safety compliance. The results also indicated that emotional intelligence plays a coordinating role in the relationship between work stress and safety compliance. The study also shows that safety behavior can be characterized as "worker behavior and attitudes towards safety activities". It was emphasized that the information collected as part of the research study was kept confidential and that no individual was identified from the questionnaire, but self-reported data on safety behaviors and responses to work stress in container terminal operations Perception can have an impact. Employees have been exposed to stigma because they are reluctant to answer or report accurately for fear of being reprimanded by their superiors. Therefore, further research may be able to measure worker safety behavior through real-world observations. So, all this suggests that it is advisable to conduct a study on safety behavior on construction worker.

[14] conducted a study to determine which employer behavioral safety compliance factors contribute to promoting employee behavioral safety adherence. This paper is an initial study that hopes its results will lead to the definition of safety indicators for behavioral safety compliance in the construction industry. Safety Behavior according to Mahmood in [14] describes as the behavior that supports safety praxis and activities essentially giving safety coaching and safety conformity, which outlines the key activities that employees must carry out in accordance with occupational safety, and health regulations to prevent workplace mishaps. As a result, the most important factor regarding employer behavioral safety compliance is management commitment, followed by organizational commitment, safety communication, safety leadership, effective safety training, safety motivation, safety management system, and safety regulations. and regulations, health and safety officers, and personnel protection followed. Equipment is ranked in order of importance. Employer behavioral factors help drive worker behavior towards compliance with occupational health and safety regulations in the construction industry.

The explanation of safety behavior from [10–14] suggests that it is advisable to conduct a study on safety behavior of construction workers.

Regular observation of actual safety behavior is preventative. This allows additional safety-related issues to be found in the chain of causes and corrected before the event occurs. Collaborative problem-solving where safety behavior serves as a metric so management and employees identify key clusters of safe and unsafe behaviors and use these insights to create a 'Safe Behavior Inventory' Strategy is implemented [15]. For this reason, it is necessary to analyze safety behavior, especially human role in it. Because humans itself still play the major role in safety behavior.

As mentioned, improper selection of workers can also affect safety performance in a construction project. Whereas, [16] conducted a study which showed safety behavior is connected with worker's demographics (age and job experience), personality factors, and attitudes toward inquiries.

Furthermore, a research by [17] said that one of the individual characteristics, which influence safety behavior, is the Big Five Personality. As a reputable personality structure categorization approach, The Big Five Personality Model has validity and reliability that have been regularly proven by many investigations, including research. Therefore, it's necessary to include Big Five Personality as a variable to find best safety behavior model.

Meanwhile [18] stated that personal values have an influential on workers' safety behavior in the maritime industry (seafarers). Furthermore, [19] conducted a study to investigate the relationships big five personality and personal value. The outcome of study showed that there is correlation between Big Five Personality's and personal value. So, it is essential to investigate the effect of big five personality on safety behavior through personal value.

[20] examined leadership elements, safety culture, and safety behavior in construction workers in China. The result showed that the LCB approach leads to sustainable change in unsafe behavior when aimed at improving safety governance and safety culture. Researchers have not found any studies that have investigated the relationship between Big 5 personalities and safety culture. Researchers have not found studies that investigate the relationship between big five personality and safety culture. Hence this is become the reason for conducting a study by making safety culture as a mediating variable between big five personality and safety behavior.

Through a literature review, it has been proven that each of the big five personality, personal value and also safety culture variables has an impact on the safety behavior of construction workers. The problem, which arises, is whether these variables also have an influence on other variables in relation to safety behavior.

Thus, this study was drafted out in order to establish a model by utilizing the Big Five Personality as a variable to predict a safety model focusing on worker safety behavior. In addition, personal values and safety culture are set as intervening variables. These variables will be used to analyze the indirect relationship between big five personality and safety behavior. Hope that the use of personal value and safety culture variables as intervening variables can provide a better illustration of the model.

3. The aim and objectives of the study

The intention of this research is to investigate the effect of Big Five personality traits, safety culture, and personal values, on safety behavior from construction worker in Indonesia using SEM-PLS.

To achieve this aim, the following objectives are accomplished:

– to study the big five personality, safety culture, personal values, and safety behavior from construction worker;

– to conduct PLS-SEM analysis to see the correlation between employee status and safety behaviour.

4. Materials and methods of research

The objects in this study were 10 high-rise building construction projects with designation as hotels, offices, hospitals, apartments and malls. The consideration in the selection of this high-rise project is that at this level of work, there are quite a number of workers involved in one project activity audit that lasts for a long period of time, so in this process, an assessment of the Behavior of project workers can be comprehensive. The construction projects used as research objects are located in three East Java cities: Surabaya, Malang, and Batu. Therefore, representing various city levels will increase the objectivity of the analysis results. Interviews were used supplement questionnaires. The sample is based on some criteria, which are:

1. Types of workers are types of workers based on contracts entered into with construction companies, with sub-criteria for permanent workers, contract workers with non-permanent contracts, contract workers with specific contracts, outsourcing workers and daily workers.

2. Age of workers, with sub-criteria age under 30 years old (<30 years), between 30 to 45 years old (30–45 years), and above 45 years old (>45 years).

3. Experience is the length of time someone has worked in the field with sub-criteria <2 years, 3–6 years, >6 years

4. Education, with the sub-criteria: ungraduated, Junior High School, Senior High School, Diploma/Bachelor.

The following is the hypothesis in this study:

– H0: There's no significant influence of Big Five Personality on safety behavior; H1: There's positive and significant influence of Big Five Personality on safety behavior;

– H0: There's no significant influence of Big Five Personality on personal value; H2: There's positive and significant influence of Big Five Personality on personal values;

– H0: There's no significant influence of Big Five Personality on safety culture; H3: There's positive and significant influence of Big Five Personality on safety culture;

– H0: There's no significant influence of Personal values on safety culture; H4: There's positive and significant influence of Personal values on safety culture;

– H0: There's no significant influence of Personal values on safety behavior; H5: There's positive and significant influence of Personal values on safety behavior;

– H0: There's no significant influence of Safety culture on safety behavior; H6: There's positive and significant influence of Safety culture on safety behavior;

– H0: There's no significant indirect influence of Big Five Personality on safety culture through personal value as an intervening variable; H7: There's positive and significant indirect influence of Big Five Personality on safety culture through personal value as an intervening variable;

– H0: There's no significant indirect influence of Big Five Personality on safety behavior through safety culture as an intervening variable; H8: There's positive and significant indirect influence of Big Five Personality on safety behavior through safety culture as an intervening variable.

The main hypothesis for this study lies on H1 and H7.

When we held this survey we made assumption that all workers have attended work safety training which held by construction management. In addition, it is also assumed that workers also understand safe and unsafe behavior in the workplace.

Three hundred construction employees were given questionnaires to complete as part of the survey. The Likert scale has a 5-point scale, and this study's scoring of the respondents' responses uses that scale [21]. Accordingly, the lowest respondent's answer value is 1, and the highest is 5. Hence, the class interval is (5–1):5=0.8. In contrast, the primary interpretation of the average value employed in this study is the score explanation offered by [22].

Inferential analysis in this study uses SEM-PLS (Structural Equation Model-Partial Least Square) analysis. Meanwhile the software that are used is SmartPLS software version 3.3.3

In this study, a quantitative approach was used. Quantitative research need a research of sample of the population and relies densely on numeric data and statistical analysis. Researchers typically do quantitative research by identifying intriguing themes in terms of observable Behavior.

The authors used quantitative research based on the research objective to resolve the association between the variables of employee status and safety behaviour. The design in this study uses the PLS analysis technique, part of the SEM (Structural Equation Modeling) analysis. Likewise, with this study where the independent and dependent variables can be measured through variable indicators.

5. Results of analyzing the effect of big five personality on construction worker's safety behavior using SEM-PLS

5. 1. Big five personality, safety culture, personal value and safety behaviour of construction workers

In this study, questionnaires were distributed to the sample of respondents to obtain primary data. This study analyze five variable that consist of Big Five Personality (BFP), personal values (PV), safety culture (SC) and safety behavior (SB). Table 1 show variables, factors and it's indicators.

Table 1 shown variables, factors and it's indicators that were used in this research. Big Five Personality variables consist 44-item indicators that measuring an individual on the Big Five Factors (dimensions) of personality. Each of the elements is further categorized into personality aspects.

5. 2. Analyze using SEM-PLS

The first step in conducting an analysis using SEM-PLS is to form the inner and outer models of the observed variables. The outer model or outer relation is identified for each indicator block connected with its latent variable. The outer model tests the reliability and validity of the research instrument (questionnaire).

Fig. 1 is a conceptual framework of the research or a path diagram in SEM-PLS. This conceptual framework of the research is based on hypothesis in section 4.

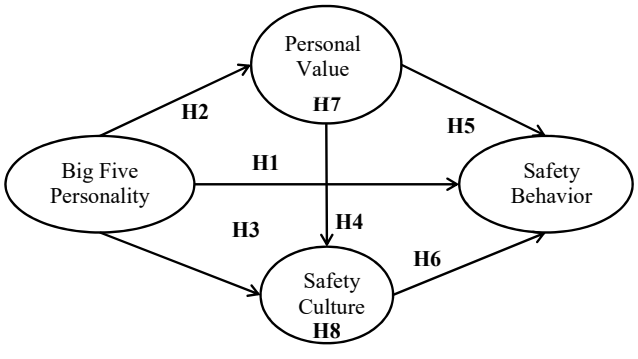

Fig. 1. Conceptual framework of research path diagram

Table 1

Variables, Factors and Indicators

Variable	Factor	Indicators
Big Five Personality	Openness	Actions; aesthetics; fantasy; feelings; ideas; values
	Conscientiousness	Achievement striving; competence; deliberation; dutifulness; order; self-discipline
	Extraversion	Activity; assertiveness; excitement; gregariousness; positive emotions; warmth
	Agreeableness	Altruism; compliance; modesty; straightforwardness; tender-mindedness; trust
	Neuroticism	angry hostility; anxiety; depression; impulsiveness; self-consciousness; vulnerability
Personal Value	Compatibility; tradition; security; virtue; universalism; stimulation; hedonism; self-direction; power; achievements	Manners; compliance; honour; respect; loyalty; tolerance; social order; organization; kindness; support; honesty; forgiveness; social justice; equation; awareness; excitement; variety; courage; fun;; fulfillment; creativity; curiosity; freedom; social power; authority; wealth; success; ability; ambition
Safety Culture	Management commitment; regulations; communication; work environment	Company priority; OHS priority; OHS rules and procedures company attention OHS equipment; OHS supervision; OHS training; procedure; K3 is easy to understand; OHS is easy to implement; OHS violations; OHS sanctions; access to OHS information; OHS information; work accident information; communication; communication between workers; hazard warning and OHS; OHS reporting; satisfaction; OHS safety; OHS motivation; not bored; OHS engagement; information delivery
Safety Behavior	Obedience; participation	Disregard rules; allowance; take risks; compliance; supervisor instructions; targets; target option; rule violation; sanction; management pressure; work procedure errors; attention; reminding; influence; joke; equipment; OHS equipment

The findings of the calculated factor loadings can be used to evaluate the adequacy of measurement models. If the t-value of a variable's loading factor is more than the critical value, which is 1.96, and/or its standard loading factor is 0.70, it is contemplated to have remarkable validity against its latent or construct variable. Both of Criteria of Composite Reliability (CR)≥0.70 criteria and Average Variance Extracted (AVE)≥0.50 criteria, conceivable used in PLS to evaluate the reliability of the measurement model. The outcome of the validity and reliability tests can be seen in Table 2.

Refers to the results of both the CR and AVE calculations at the Table 2 above, all reflective indicator Loading factor values are ≥0.50 (Valid), and the AVE value is ≥0.50 (Valid), therefore all indicators that measure them are valid. While the reliability calcu-

lation results show the Composite Reliability (CR) value is ≥0.70 (Reliable). Thus it can be concluded that all latent variables have indicators that are good enough and feasible.

Table 2

Evaluation of Stage 2 Measurement Model

Variable	Validity Overall (Per Construct)		Composite Reliability (>0.7)=Reliable	
	AVE (>0.5)=Valid			
	AVE	Conclusion	CR	Description
Big Five Personality (BFP_X)	0.819	Valid	0.995	Reliable
Personal Value (PV_Y1)	0.833	Valid	0.993	Reliable
Safety Culture (SC_Y2)	0.833	Valid	0.992	Reliable
Safety Behavior (SB_Y3)	0.736	Valid	0.980	Reliable

The inner model is estimated by looking at the proportion of variance that explained, specifically the R-Square value of endogenous variables, analyses to test the correlation value, and the significance of T-statistics utilizing resampling processes such as bootstrapping to provide estimate stability [22].

When evaluating structural equation models (SEM) in PLS, the R-squared value of each endogenous latent variable is first considered as the predictive power of the structural model, similar to interpretation from OLS (ordinary least squares) regression. Differences in the R-Square value can be used to explain whether particular exogenous latent variables have a substantial consequence on endogenous latent variables: whether they are essential or not. The amount of variation explained by the model is represented by the PLS result. Table 3 shows the PLS r-square results for the model's constructs.

Table 3

PLS R-Square Evaluation Results

Influence		R Square	
Big Five Personality (BFP_X)	→	Personal Value (PV_Y1)	0.620
Big Five Personality (BFP_X)	→	Safety Culture (SC_Y2)	0.740
Personal Value (PV_Y1)	→		
Big Five Personality (BFP_X)	→	Safety Behavior (SB_Y3)	0.834
Personal Value (PV_Y1)	→		
Safety Culture (SC_Y2)	→		

Table 3 shows that Big Five Personality model's coefficient of determination (R-square) for Personal Value is 0.62. So it can be explained that the accuracy of measuring Big Five Personality on Personal Value is 62 % and the remaining 38 % is impacted by variables outside of the research. Similarly, the coefficient of determination calculated from the Big Five Personality, Personal Value on Safety Culture model is 0.74, so it can be explained that the accuracy of measuring Big Five Personality, Personal Value on Safety Culture is 74 % and the remaining 26 % is impacted by variables outside of the research. The Big Five Personality, Personal Value, and Safety Culture model's coefficient of determination on Safety Behavior is 0.834, so it can be explained that the accuracy of measuring Big Five Personality, Personal Value and Safety Culture on Safety Behavior is 83.4 % and the remaining 16.6 % is impacted by other variables outside the study.

The coefficient of total determination (Q^2) is used to assess the goodness of fit model, and the test results may illustrate how well the route model produced can describe the observed data. The coefficient of total determination spans between 0.0 and 100.0 %, with the greater the percentage of total determination, the better the route model can describe the observed data. The proportion of total determination calculation outcomes are as follows:

$$\begin{aligned} Q^2 &= 1-\left(1-R_1^2\right)\times\left(1-R_2^2\right)\times\left(1-R_3^2\right)= \\ &= 1-\left(1-0.620\right)\times\left(1-0.740\right)\times\left(1-0.834\right)= \\ &= 0.984 = 98.4\,\%, \end{aligned} \quad (1)$$

the proportion of total determination (Q^2) derived from the structural model is 0.984, which suggests that the path model created can explain 98.4 % of the data and the remaining 1.6 % is explained by factors outside the research. Based on the criteria made, the model constructed is in the category of strong models for theory confirmation. So that the use of path construction is declared appropriate and feasible to test the hypothesis.

Meanwhile, based on the GoF SEM-PLS calculation in this research, it is as follows.

$$\begin{aligned} GoFY_{SB}^3 &= \sqrt{\left(AVExR^2\right)}, \\ GoFY_{SB}^3 &= \sqrt{\left(0.736\times 0.834\right)}, \\ GoFY_{SB}^3 &= 0.783, \end{aligned} \quad (2)$$

the GoF criterion is said to be small if it is 1.0, moderate if it is 0.25, and high if it is 0.38. Based on the GoF calculation above, the Safety Behavior measurement has a GoF value of 0.783, meaning that the model accuracy test states that it is adequate and can be applied for hypothesis testing.

This part examines the coefficients or parameters that demonstrate the statistical correlation or the influence of one latent variable on another. If the critical ratio (C.R.) value is between –1.96 and 1.96 ranges with a significance level of 0.05, the statistical association is ruled insignificant or unimportant. The findings of the structural model's crucial ratio value estimation are achieved using the PLS software application. In summary, the outcomes of these coefficients' computation are shown in the Table 4 below.

From the results shown in the Table 4 above, it can be draw the inference that H_1–H_6 are significantly acceptable. This means that:

1. Big Five Personality has a substantial consequence on the Personal Value variable with Path Coefficient 0.788.
2. Big Five Personality has a substantial consequence on the Safety Culture variable with Path Coefficient 0.545.
3. Personal Value has a substantial consequence on the Safety Culture variable with Path Coefficient 0.363.
4. Big Five Personality has a substantial consequence on the Safety Behavior variable with Path Coefficient 0.299.
5. Personal Value has a substantial consequence on the Safety Behavior variable with Path Coefficient 0.233.
6. Safety Culture Variable has a substantial consequence on the Safety Behavior variable with Path Coefficient 0.444.

Table 4

Results of Sem-PLS Path Analysis

The Effect between Latent Var.			H	Path Coef.	t-value	p-value	Description
Explanatory Var.	→	Response Var.					
Big Five Personality (BFP_X)	→	Personal Value (PV_ Y1)	H_1	0.788	16.939	0.000	Significant (H_1 accepted)
Big Five Personality (BFP_X)	→	Safety Culture (SC_Y2)	H_2	0.545	4.889	0.000	Significant (H_2 accepted)
Big Five Personality (BFP_X)	→	Safety Behavior (SB_Y3)	H_3	0.299	2.39	0.017	Significant (H_3 accepted)
Personal Value (PV_Y1)	→	Safety Culture (SC_Y2)	H_4	0.363	3.204	0.001	Significant (H_4 accepted)
Personal Value (PV_Y1)	→	Safety Behavior (SB_Y3)	H_5	0.233	2.301	0.022	Significant (H_5 accepted)
Safety Culture (SC_Y2)	→	Safety Behavior (SB_Y3)	H_6	0.444	4.210	0.000	Significant (H_6 accepted)

Mediating variable analysis can be done through two approaches, namely coefficient differences and coefficient multiplication. The coefficient difference approach uses an examination method by conducting an analysis with and without involving the mediating variable. In this case, the detection is carried out with the coefficient multiplication approach. After going through the analysis process, the results of the coefficient multiplication are known as described in Table 5 below.

Based on the Table 5 above, it can be seen that the effect of latent variables indirectly on the intended latent variable in the context of 2 segments. The interpretation of the Table 5 is as follows:

1. The indirect effect of Big Five Personality (BFP_X) on Safety Behavior (SB_Y3) through Personal Value (PV_Y1) is 0.183 with a p-value of 0.043. Because the p-value=0.043<0.05, it is statistically declared Significant. So it can be concluded that Personal Value (PV_Y1) is able to act as a mediation between the influence of Big Five Personality (BFP_X) on Safety Behavior (SB_Y3).

2. The indirect effect of Big Five Personality (BFP_X) on Safety Behavior (SB_Y3) through Safety Culture (SC_Y2) is 0.242 with a p-value of 0.008. Because the p-value=0.008<0.05, it is statistically significant. So it can be concluded that Safety Culture (SC_Y2) is able to act as a mediation between the influence of Big Five Personality (BFP_X) on Safety Behavior (SB_Y3).

The following measurement model path diagram and structural model may be used to represent the path coefficients in the structural model and the factor weight values of the manifest variables in the measurement model. The path coefficients within the structural model and also the weight values of the manifest variables within the measure model is delineate through the trail diagrams of the measure model and also the structural model, as shown in Fig. 2.

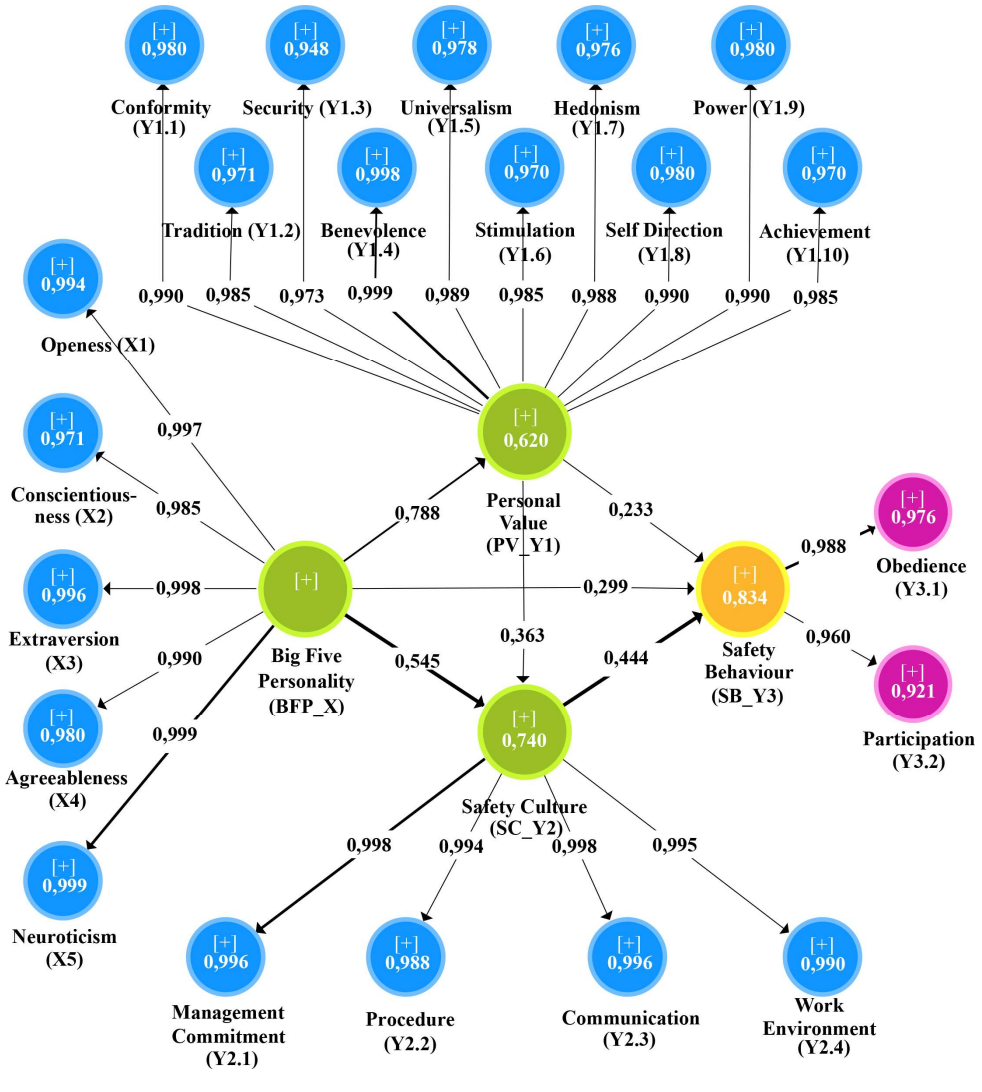

Fig. 2. Measurement model path diagram and structural model

Table 5

Two Segment Mediation Variable Testing

No.	Relationship between variables			H	Indirect Effect	P-Value	Description
	Explanatory Var.	Mediating Var.	Response Var.				
1	Big Five Personality (BFP_X)	Personal Value (PV_Y1)	Safety Behavior (SB_Y3)	H_7	0.183	0.043	Significant (H_7 accepted)
2	Big Five Personality (BFP_X)	Safety Culture (SC_Y2)	Safety Behavior (SB_Y3)	H_8	0.242	0.008	Significant (H_8 accepted)

Based on the Fig. 2, it can be seen that the Safety Behavior variable (SB_Y3) is more dominantly influenced by the Safety Culture variable (SC_Y2), namely with the highest path coefficient of 0.444, while the Safety Culture variable (SC_Y2) is more dominantly influenced by the Big Five Personality variable (BFP_X), namely with the highest path coefficient of 0.545, where the sub-variable whose dominant role in representing the Big Five Personality variable (BFP_X) is the Neuroticism dimension (X5) with the highest loading factor of 0.999. While the Neuroticism (X5) sub-variable is more dominantly measured by the BFP40 indicator (prefers silence) with the highest loading factor of 0.928.

6. Discussion of Hypothesis Testing Results (Path Analysis)

Looking at the results in Table 2, it is possible to conclude that indicators of latent variables are good enough and feasible metrics. In addition, based on Table 3, it is possible to see that the key values (R-squared) for the three latent/independent variable, which are obtained are sufficiently high. The higher the coefficient of determination of a variable, the better the path model can represent the observed data. This means that the R-squared outcome obtained in the model can clearly represent the data in the field.

Also, from the results shown in the Table 4 above, it can be draw the inference that H_1–H_6 are significantly acceptable. This means that Big Five Personality has a substantial consequence on other latent variables and dependent variable, Safety Behavior. Meanwhile, the results of Table 5 clearly show that H_7 and H_8 are significantly acceptable. This means that Big Five Personality has an indirect consequence on Safety Behavior through Personal Value and Safety Culture.

Fig. 2 shows that Big Five Personality has direct and indirect effect on Safety Behavior (SB) variable. Its direct effect has path coefficient of 0.299. Among the indicators, Neuroticism plays the most important role in measuring the Employee Status (ES) construct, with a loading factor of 0.999. Big Five Personality also effect Personal Value and Safety Culture relating on Safety Behavior. Also Personal value has a significant effect on Safety Culture beside it influence on safety behavior. In addition, it can be seen that Obedience explains safety behaviour slightly better than Participation. Based on the discussion, it can be concluded that Big Five Personality has a positive and substantial consequence on safety behavior. In contrast, Big Five Personality has an indirect influence on safety behavior through Personal Value as an intervening variable. Safety culture can also mediate the influence of the big five personal values on safety behavior. In addition, Personal Value and Safety Culture together are able to act as mediation between the influence of Big Five Personality on Safety Behavior.

Compared to [15–20], which only investigate the effect or correlation between each variable on safety behavior, this study has the peculiarity to examine the indirect effect or correlation between each variable. As a statistical recommendation, it is necessary to evaluate strategic policies by construction management regarding recruitment worker.

The limitation of this study lies in the results of the research, which only serve as the basis for determining policy by project management but do not provide an absolutely precise safety procedure. It is related to the limitations of the research location and the limited gender proportion of construction workers in Indonesia.

What might be developed from this research is to focus more on demographic of construction workers as the object of research, such as ethnicity so we can get more reliable and unbiased or diversity in the responses.

7. Conclusions

1. Safety behavior of construction workers was influenced by many factors. Factors that are known play a role in safety behaviour are big five personality, personal value and safety culture.

2. Through this study, it has been proven that each of the big five personality, personal value, safety culture variables has an impact on the safety behavior of construction workers.

Comparing with previous studies that still yet prove whether big five personality also have an influence on other variables in relation to safety behavior. The problems that arise from previous studies are answered in this study where the results indicate a significant influence of the big five personality on personal value and a significant influence on safety culture.

The results obtained in this study indicate that the big five personality as part of individual construction workers plays a very important role in the creation of safety behavior, both directly and indirectly.

Therefore, construction companies need to consider the big five personality factor in making policies regarding worker safety. Policy making starts even from the initiation stage, namely determining project resources, more specifically in the stage of recruiting construction project workers.

Conflict of interest

The authors declare that there's no conflict of interest to this research, whether financial, personal, authorship or otherwise, that could affect the research and its results presented in this paper.

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Data availability

Data cannot be made available for reasons disclosed in the data availability statement.

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