

# Organizational Commitment Mediating the Effects of Big Five Personality Compliance to Occupational Safety Standard Operating Procedure

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## ABSTRACT

The incidence of work accidents in the construction industry particularly in Indonesia and generally in international shows an increasingly worrying trend given that either quantitatively or qualitatively the number of work accidents is very large compared to that of other industrial sectors. The main causing factors are mostly due to the workers' behavior. This study aimed to determine the roles of organizational commitment in mediating the effects of Big Five Personality on workers' compliance to occupational safety standard operating procedure (SOPs). The study belongs to observational analytic type with cross sectional study design. The study involved 140 samples taken randomly from workers at manufacturing department of PT. Boma Bisma Indra Pasuruan, East Java. The measurement of personality used five factor model (FFM) questionnaire of Costa & McCrae. Hypothesis testing applied inferential statistical analysis. The statistical method used was Structural Equation Model (SEM). The results showed that Organizational Commitment had lower roles in mediating the effects of Big Five Personality on workers' compliance to occupational safety standard operating procedure (SOPs) compared to that Big Five Personality in directly influencing the workers' compliance to occupational safety standard operating procedure at PT. Boma Bisma Indra Pasuruan.

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## 1. INTRODUCTION

The cases of occupational accidents in construction industry are the major causes of death in the workplace in the US [1],[2]. The economic impact of workplace accidents reaches 845.6 billion dollars in 2010 [3]. The construction industry reaches the highest rank of the total amount of compensation to be paid compared to that of other industries. Globally occupational accidents reach 337 million cases per year, in which 2.3 million people die [4]. Every year an estimated 11,000 workers are killed and 2.5 million are seriously injured in the United States. This has resulted in loss of work productivity for 250,000 years [2].

Occupational health and safety (K3) in Indonesia is often ignored [5] indicated by the high number of work accidents in the industrial sector up to 2012 which recorded 103,074 cases (388 cases per day) with a claim value of IDR 585 billion [6]. Workplace accident in construction sector in Indonesia is the largest contributor to workplace accident the last few years. Data from Ministry of Manpower and Transmigration in

2009-2010 showed that an average of 91,000 cases of occupational accidents occurred every year result in death of 1,550 workers, while about 8,600 workers suffer from permanent disability [7]. 3% causes of work accidents are due to factors that cannot be avoided, 24% due to environment or illegible equipment, and 73% due to unsafe behaviors. Job insecurity will affect the workers' safety compliance [8].

A behavior safety practitioner suggests that occupational safety practitioners forget the main aspects of occupational accident prevention, namely workers' behavior [9]. Personality is a means of determining an individual's behavior [10]. When related with the type of daily work, big five personality is an accountable predictor [11]. The research on human resources in industry shows that personality factor of workers influences the organizational commitment [12].

## 2. RESEARCH METHOD

### 2.1. Research design

The subjects of this study were workers at manufacture department in the construction industry of PT. Boma Bisma Indra - Pasuruan - East Java. Samples were taken randomly in total of 140 workers. This research is an observational analytic study with cross sectional study design. The measurement of personality used the improved five factor model (FFM) questionnaire s of Costa & Mc. Rae.

### 2.2. ConceptFramework

Here will be presented the conceptual framework of organizational commitment role in mediating the relationship between big five personality with compliance to standard operation procedure worker safety, as shown in Figure 1.

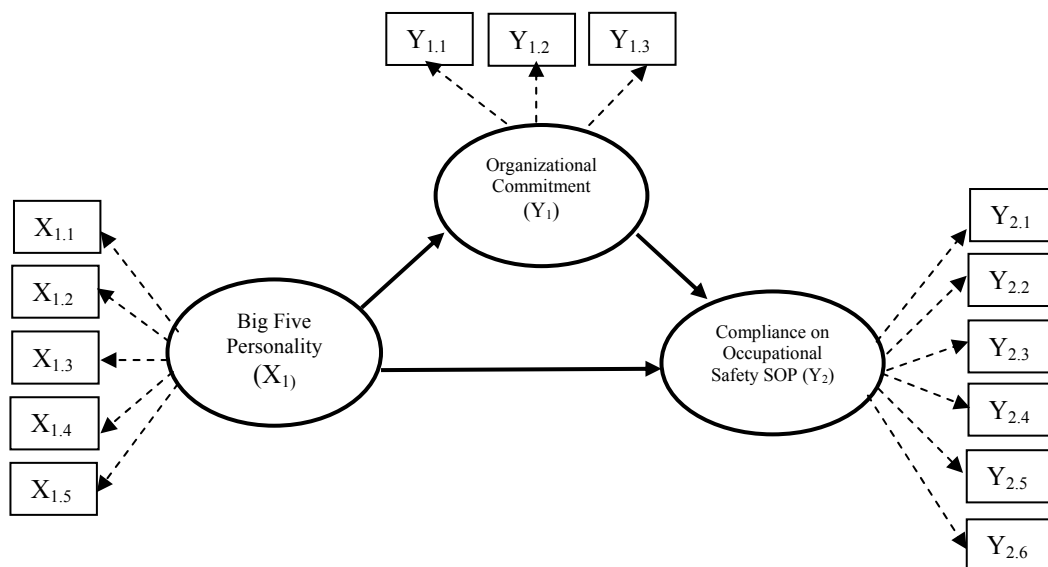


Figure 1. Framework of Research Concept

Figure 1 shows that organizational commitment (Y<sub>1</sub>) (has 3 indicator) is a variable indogen whose role is to mediate the relationship between the variables of the big five personality (X) (has 5 indicators) is an exogenous variable by variable compliance to standard operating procedure safety (having 6 indicators) which is a variable indogen (Y<sub>2</sub>)

### 2.3. Data processing

Data analysis in this research used structural equation model with Amos. Samplesize depends on the number of indicators used in the entire latent variables. The number of samples is equal to the number of indicators multiplied by 5 to 10 [13]. Referring to this opinion, the number of samples was 140 respondents.

### 3. RESULTS AND ANALYSIS

#### 3.1. Instrument Test

##### 3.1.1. Construct Validity and Reliability Tests

Validity test was made to consider which questions were representative to be used to represent the independent variables performed using confirmatory factor analysis on each of the latent variables (big five personality, organizational commitment and workers' compliance on occupational safety standard operating procedure) using AMOS program version 18. An indicator of variable is said to be valid if it has a value of loading factor  $\geq 0.4$  and is significant at  $\alpha = 5\%$  [14]. The research instrument is valid if it has a value of goodness of fit index (GFI)  $> 0.90$ .

The instrument is said to be reliable if the measuring instrument gains consistent results. Reliability indicates how much the measurement can provide relatively different results when the measurement is taken back to the same subjects. Reliability is calculated by using composite (construct) reliability with cut-off value  $\geq 0.6$  [15]. The formula for calculating the construct reliability is as follows [16]:

$$\text{Construct-reliability} = \frac{(\sum \text{std Loading})^2}{(\sum \text{Std Loading})^2 + \sum \epsilon_j}$$

##### 3.1.2. Construct Validity and Reliability Tests of Big Five Personality and Organizational Commitment

The results of validity and reliability tests of big five personality and organizational commitment had a loading factor value of all latent variable indicators (value of estimate standard regression weights) of  $\geq 0.4$  and t value of (CR  $> 1.96$ ); the indicator value was higher than the critical value of significance level of ( $\alpha$ ) 0.05. Likewise, the probability of value was smaller than  $\alpha$  ( $p < 0.05$ ). It was concluded that all variable indicators of big five personality constructs and organizational commitment were valid.

Writer suggested the following will test the validity and reliability of the big five personality variables and organizational commitment as stated in Figure 12 below:

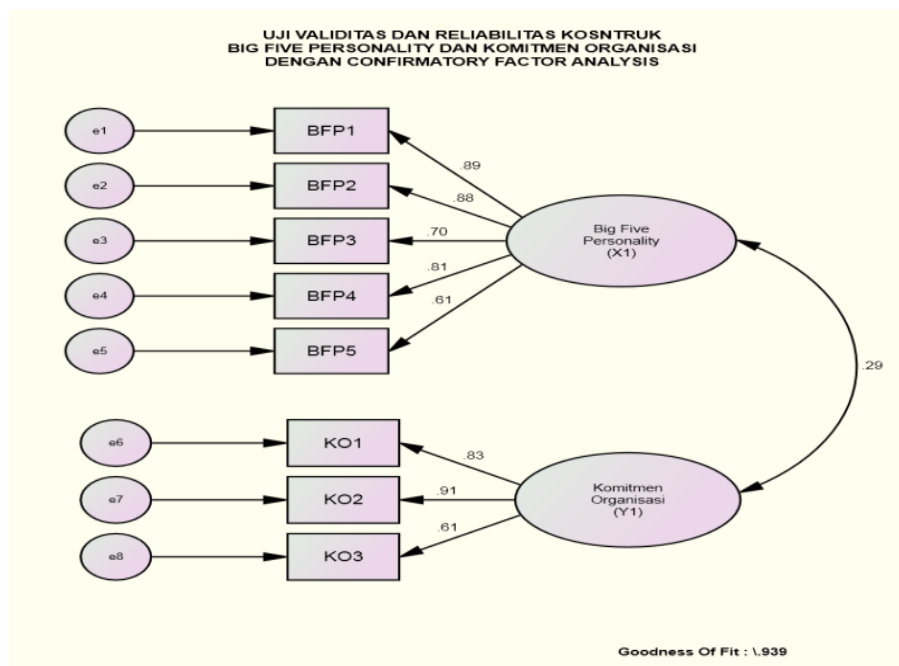


Figure 2. Results of construct validity test of big five personality and organizational commitment source: confirmatory factor analysis with AMOS Program version 18

Figure 2 shows all indicators of the big five personality and organizational commitment is valid and reliable, it will be strengthened by the results of the test construct validity big five personality and organization commitment as set forth in Table 1.

Table 1. Resultsof Construct Validity Test of Big Five Personality and Organizational Commitment

	Estimate	S.E.	C.R.	P	Estimate Standardized Regression Weights
BFP5 <--- X1	1.000				.614
BFP4 <--- X1	1.042	.160	6.528	***	.812
BFP3 <--- X1	.882	.150	5.884	***	.701
BFP2 <--- X1	1.143	.166	6.889	***	.885
BFP1 <--- X1	1.198	.174	6.904	***	.888
KO3 <--- Y1	1.000				.612
KO2 <--- Y1	1.621	.260	6.244	***	.908
KO1 <--- Y1	1.481	.233	6.359	***	.832

Source: Confirmatory Factor Analysis with AMOS Program Version 18

Based on Table 1, the big five personality indicator consists of BFP 1 (openness to experience), BFP 2 (conscientiousness), BFP 3 (extraversion), BFP 4 (agreeableness) and BFP 5 (neuroticism). While the indicator includes KO1 organizational commitment (affective commitment), KO2 (continuing commitment) and KO3 (normative commitment). In the big five personality indicator, openness indicator is an indicator which has a value estimate highest standard regression weights, showed openness to experience is the greatest indicator gives effect to the big five personality. Similarly thing with continuing commitment indicator has a value estimate highest standard regression weights, this indicator shows the on going commitment is the biggest influence on organizational commitment.

Based on the description, it can be concluded, all the indicators of the big five personality (BFP 1 to 5) have a value estimate standard regression weights with values  $\geq 0.4$  which means that all indicators of the big five personality is valid. Similarly, the indicator of organizational commitment (KO1 up to KO3) is valid and reliable for all indicators, mean value estimate is still above the required standard regression weights are  $\geq 0.4$  [14].

### 3.2. Construct Validity and Reliability Test of Compliance on Occupational Safety Standard Operating Procedure (SOPs).

The following will explain the results of construct validity and reliability standard operating procedure compliance to safety, as set out in Figure 13 and table 2 below.

Validity test of latent variables of workers' compliance to occupational safety standard operating procedure by confirmatory factor analysis is presented in Figure 13. Based on the calculation, it was found that the value of loading factor of all indicators of latent variables had a value of  $\geq 0.4$  and t value of (CR > 1.96). The value of each loading factor of variable indicator is greater than that of the critical value at significance level of ( $\alpha$ ) 0.05. Likewise, the probability value is smaller than  $\alpha$  ( $p < 0.05$ ). It was concluded that all the variable indicators used had a significant relationship with the variable of workers' compliance to occupational safety standard operating procedure; in other words all variables construct indicators standard operating procedure compliance to safety.

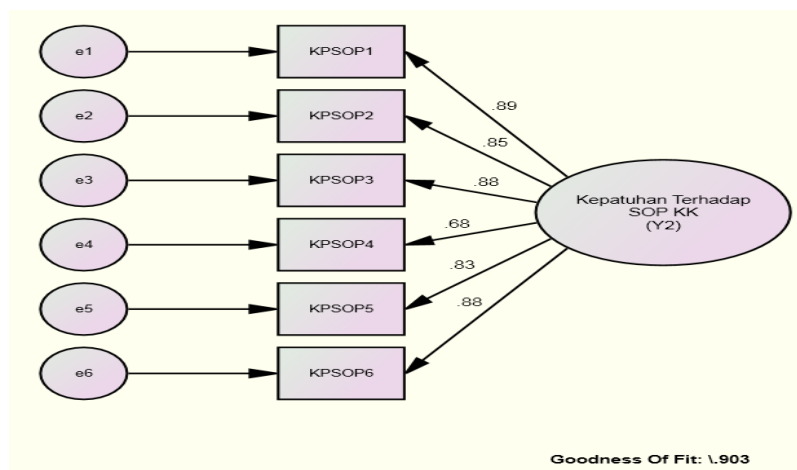


Figure 3. Construct validity of test results compliance standard operating procedure safety

Figure 3 shows all the indicators of compliance with safety standard operating procedure are valid and reliable; it will be strengthened with the construct validity of the test results standard operating procedure compliance to safety as outlined in Table 2.

Table 2. Results of Construct Validity Test of Compliance on Occupational Safety Standard Operating Procedure

	Estimate	S.E.	C.R.	P	Estimate Standardized Regression Weights
KPSOP6 <--- Y2	1.000				.876
KPSOP5 <--- Y2	1.054	.094	11.251	***	.833
KPSOP4 <--- Y2	1.153	.142	8.130	***	.683
KPSOP3 <--- Y2	1.423	.114	12.506	***	.880
KPSOP2 <--- Y2	1.050	.091	11.597	***	.847
KPSOP1 <--- Y2	1.130	.089	12.667	***	.886

Source: Confirmatory factor analysis by AMOS Program Version 18

Based on the Table 2, the indicator variable compliance to SOPs safety consisting of KSOP1 (reciprocal), KSOP2 (commitment), KSOP3 (authority), KSOP 4 (social proof), KSOP 5 (opportunities more attractive) and KSOP 6 (love /know). In the variable compliance to standard operating procedure safety, indicators KSOP1 (reciprocal) is an indicator which has a value estimate standard regression weights high, it indicates KSOP1 (reciprocal), is an indicator that the greatest influence on the variable compliance to standard operating procedure safety to estimate standardized regression weights of 0.886, mean value estimate is still above the required standard regression weights are  $\geq 0.4$  [14].

Based on these descriptions and tables of test results construct validity standard operating procedure compliance to safety, we conclude the construct reliability values of all the indicators in the variable standard operating procedure compliance to safety based on the calculation of 0.93 is above the minimum recommended value that is 0.60, so all indicators standard operating procedure adherence to worker safety is reliable.

### 3.3. SEM Assumption Test

#### 3.3.1. Data Normality Test

The results of normality test gave a CR value of 1,247 located between  $-1.96 \leq CR \leq 1.96$  ( $\alpha = 0.05$ ), so it can be said the multivariate data were normal. The univariate data were also normal indicated by the value of the critical ratio of all indicators located between  $-1.96 \leq CR \leq 1.96$  [15].

#### 3.3.2. Test Multicollinearity or Singularity

Multicollinearity is the occurrence of significant correlation between exogenous variables in the formed SEM model. Since SEM analysis model in this study has only one exogenous variable i.e. big five personality, it is not necessary to test the multicollinearity [15].

#### 3.3.3. Outlier Test of Data

The results of outlier test appear in Malahnobis distance. Based on the calculation, the value of Malahnobis distance based on Chi squares at degree of freedom of 14 (the number of variable indicators) at the level of  $p < 0.05$  ( $\chi^2_{0,05}$ ) was 23.685 (based on distribution table  $\chi^2$ ). Accordingly, the data that had Malahnobis distance higher than 23.685 were multivariate outlier. It was concluded there was no outlier indicated by distance Malahnobis value not greater than 23.685 [13].

#### 3.3.4. Analysis of Structural Equation Modeling

The results of SEM test by AMOS program 18 result the final in structural equation modeling (SEM), which showed the roles of the organization commitment in mediating the effects of big five personality on workers' compliance to occupational safety standard operating procedure by AMOS program 18 shown is presented in Figure 14.

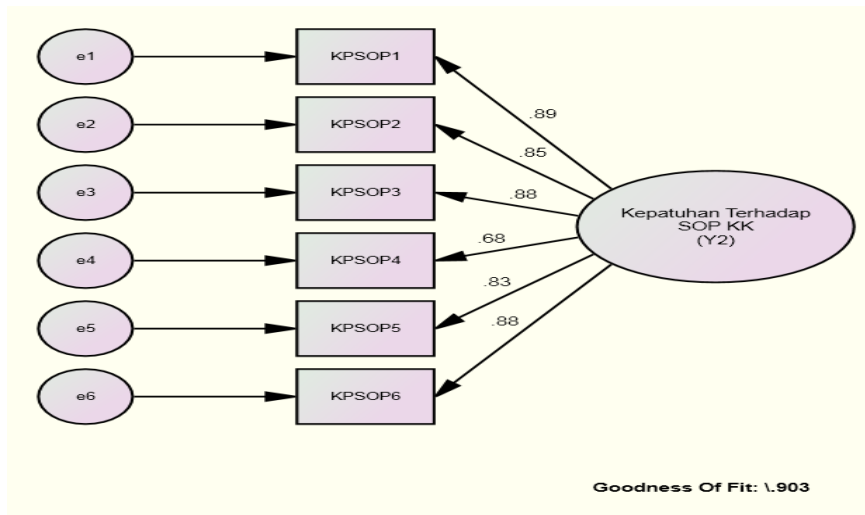


Figure 4. Results of SEM analysis of the role in mediating the effects of organizational commitment big five personality on compliance to occupational safety standard operating procedure

Figure 4 shows that the big five personality directly significantly affect safety standard operating procedure compliance with the structural coefficient of 0.43 with ap value of <0.001. Big five personality indirectly significantly affect compliance to standard operating procedure safety through organizational commitment to structural coefficient of 0.75 with ap value of 0.002. This shows that organizational commitment is a variable that can mediate and also variable between big five personality with compliance to standard operating procedure worker safety.

**3.4. Compliance Test Model SEM (Goodness of Fit Test)**

Once the path analysis performed until a final model of organizational commitment role in mediating the effects of the big five personality adherence to standard operating procedure worker safety, The following will be presented the results of the suitability test SEM models (goodness of fit) of the value of Chi Square, Sig. Probability, RMSEA, GFI, AGFI, CMIN / DF, TLI and CFI as listed in Table 3.

Table 3. SEM Fit Index

Criteria	Cut-Off Value	Calculation Results	Notes
Chi Square	Expected small ( <math>\chi^2</math> with df = 74 is 95.082) Prob. > 0,05	94.451 Prob.= 0.06	Eligible
Sig. Probability	$\geq 0.05$	0.060	Eligible
RMSEA	$\leq 0.08$	0.073	Eligible
GFI	$\geq 0.90$	0.928	Eligible
AGFI	$\geq 0.90$	0.902	Eligible
CMIN/DF	$\leq 2$ atau 3	2.087	Eligible
TLI	$\geq 0.95$	0.962	Eligible
CFI	$\geq 0.95$	0.987	Eligible

Based on table 3, it can be explained that the results of the test the suitability of the model SEM (goodness of fit), it can be concluded that the test results similar of SEM models indicate that the model is formed meet the eligibility criteria required eight covering significansi with the calculated probability of 0.060 (on a cut-off value of  $\geq 0.05$ ), RMSEA by the calculation of 0.073 (on a cut-off value  $\leq 0.08$ ), GFI by the calculation of 0.928 (on a cut-off value  $\geq 0, 90$ ), AGFI by the calculation of 0.902 (on a cut-off value of  $\geq 0.90$ ), CMIN / DF with the result of calculation of 2.087 (on a cut-off value of  $\leq 2$  or 3), TLI by the calculation of 0.962 (on a cut-off value  $\geq 0.95$  and the CFI with the result of calculation of 0.987 (on a cut-off value of  $\geq 0.95$ , so the model is formed can be received, meaning there is a fit between model and data.

**3.5. Causality Test**

The following will be presented causality test to determine the influence between the variables as presented in Table 4.

Table 4. Hypothesis Test Results

Variable	Path Coeficient	C.R	Probability	Notes
$Y_1 <--- X_1$	0.352	2.629	0.009	Significant
$Y_2 <--- X_1$	0.576	3.928	***	Significant
$Y_3 <--- X_1$	0.632	4.599	***	Significant

Based on table 4 of the hypothesis test result can be explained that the big five personality significant impact on the organization's commitment to the path coefficient of 0.352 with a 0.009 probability level. Organizational commitment significantly influences compliance to standard operating procedure worker safety with path coefficient of 0.576 with a 0.009 probability level. Big five personality significant effect on adherence to standard operating procedure worker safety with path coefficient of 0.632 with a 0.009 probability level.

Based on the description it can be concluded that the big five personality direct significant effect on compliance to standard operating procedure worker safety. Big five personality mediated organizational commitment (indirectly) significant effect on compliance to standard operating procedure worker safety.

#### 4. CONCLUSION

The direct effect of big five personality safety on workers' compliance to occupational safety standard operating procedure is greater than its indirect effect (the effect through organizational commitment). Thus, it can be concluded that the role of organizational commitment has lower roles in mediating the effects of big five personality on compliance to safety standard operating procedure compared to those of big five personality direct effects on compliance to safety standard operating procedure at PT. Boma Bisma Indra Pasuruan.

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