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Safety Leadership and Safety Behavior in MRO Business: Moderating Role of Safety Climate in Garuda Maintenance Facility Indonesia

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ABSTRACT
The purpose of this study is to understand the influence of Safety Leadership and Safety Communication on Safety Climate and Safety Behavior at work from employees' point of view. This research was conducted at Soekarno-Hatta International Airport, Indonesia and businesses associated with Maintenance, Repair & Overhaul (MRO) owned by PT. Garuda Maintenance Facility Aero Asia Tbk. (GMF), which operates locally and internationally. It was conducted through questionnaires and aimed to reflect the organization's safety. The survey was conducted among 342 staffs of several departments in GMF. The result of this study is a positive correlation between the research questions and hypotheses in which safety leadership has a positive effect on safety climate standard with a coefficient of 0.204. That is to say, the higher the level of safety leadership, the higher the level of safety climate. Safety climate has significant effect on safety behavior, and safety communication has positive effect on safety climate. Furthermore, safety leadership has no significant effect on safety behavior. Safety leadership has significant effect on safety behavior through safety climate or partially mediates. This research is expected to contribute on safety behavior in an organization, which means reducing chance of work accidents and promoting the wellness of both employees and employers.
Keywords: safety behavior, safety leadership, safety behavior, safety communication, safety climate
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INTRODUCTION

An increasing number of passenger and cargo in air transportation shows positive trend every year. It is projected that growth will continue to increase around 6-8% per year. International Air Transport Association (IATA) predicts that by 2025 Indonesia will be on number 6 country in the world as the largest air passenger markets. Indonesia is also one of the regions with the highest fleet growth (7.4%) among other countries. Periodic maintenance and repair maintenance are required to ensure operational and aircraft safety. To do these jobs, the airlines trust the aircraft maintenance company, also known as Maintenance, Repair & Overhaul (MRO) to carry out maintenance in their aircraft. This condition makes MRO industry vital in aviation business.

MRO industry is facing various new challenges and needs to find ways to address them so that the industry can grow and sustain. One of the challenges is to reduce the number of workplace accidents that often harm individuals and companies. Workplace accidents is said to be the main cause of productivity decline (Spurgeon, Harrington, & Cooper, 1997). One factor contributing to accident in workplace is human factor. Worker behavior is a common topic in company safety, because there is evidence of the proportion of work accidents caused by individual behavior that ignores the values of work safety (What & Do, 2013). A study entitles "Safety management practices and safety behavior: Assessing the mediating role of safety knowledge and motivation" examines the effect of safety management practices on workers' attitudes and behavior in relation with safety behavior to reduce the level of accidents in the workplace (Vinodkumar & Bhasi, 2010).

As one of Asia's biggest MRO, GMF AeroAsia has 5000 employees in Jakarta and 47-line maintenance at airports around the world. Based on company report, a number of incidents are still occurred in the last 3 years, although Personal Protective Equipment (PPE) and preventive program have been provided. Lack of awareness and careless attitude often triggers workplace incidents. Those behavior may occur because there is a decrease in awareness about work safety. While the challenges and working conditions change, an understanding of how safety behavior changes is needed.

Safety behavior in MRO industry is the spirit of the industry, and it should be used as a reference by every individual or organization that has always been committed and responsible for safety. Activities such as communicating any matters related to safety, trying to actively adapt to safety, acting to preserve and improve safety, and building respect are consistently linked with the values of safety. Safety behavior reflects the extent to which an organization / company has the attitude and behavior to maintain and improve the level of safety.

Research in the field of safety has become a trend in the last three periods (Newaz, Davis, Jefferies, & Pillay, 2018; Vinodkumar & Bhasi, 2010; R. P. Zhang, Pirzadeh, Lingard, & Nevin, 2018). Those researches specifically attempt to predict the outcomes related to safety from accidents and assistance to learn and to improve safety within the organization (Newaz et al., 2018). This requires extensive knowledge, not only about the various aspects that affect safety but also about how it happens. Facts about organizational and social factors have influenced extensive researches in the field of security and safety. Although a clear consensus has not yet developed in safety culture and

safety climate, but these evidences have been widely accepted as good predictors of safety-related outcomes (He, Wang, & Payne, 2017; Lingard, Zhang, & Oswald, 2019; Mullen, 2004; Newaz et al., 2018; Sharifzadeh, Abdollahzadeh, Damalas, Rezaei, & Ahmadyousefi, 2019).

Some researchers have found out that safety leadership has an impact on safety climate (Oah, Na, & Moon, 2018; Wu, Chang, Shu, Chen, & Wang, 2011), as well as on safety communication (Greeff, 2017; Lingard, Pirzadeh, & Oswald, 2019; Lingard, Zhang, et al., 2019). Both of these are also related to safety behavior and other safety-related outcomes. This shows that the number of accidents at work can be reduced by leadership and communication (Lingard, Zhang, et al., 2019) .

Since safety is an important factor in MRO industry, the creation of safety behavior is the key to make this industry survive. The establishment of safety behavior is influenced by various factors, among others is how the work environment can create a climate that supports the values of safety, and the important issue is on the responsibility of all individuals in the industry, both leaders and employees. This situation requires leaders to stay in the same course with their employees to work in accordance with safety procedures. In addition, an employee's role in creating a safety behavior requires him to be in direct contact with activities that require a high level of safety.

THEORIES

Safety Leadership

Safety leadership is a sub-system in the organization's leadership. Safety leadership is recognized as a key indicator of safety behaviors and an essential source for motivating employees to carry out their work safely (Oah et al., 2018). According to Grill & Nielsen (2019) safety leadership is a particular leader behavior that is in the process of forming a team and is responsible for ensuring that the team actively fosters security standards and for supporting the team in achieving the organization's safety goals. In addition to the focus for individuals and team, this kind of leadership also needs to maintain the quality of the machine and technology to continue following the standard operating procedures so that the desired safety standards can be fully achieved.

Success in safety leadership can be measured from the number of work accidents. This is consistent with the research by Fernández-Muñiz, Montes-Peón, & Vázquez-Ordás findings (2017), which showed that safety leadership greatly improves employees' safety behavior, and eventually reduces the occurrence of workplace accidents in a company. Sawhney & Cigularov (2019) also found that leadership attitudes has a significant positive impact on employees' behavior. Employees' willingness to engage in improving safety in the company is largely determined by the role of their leader. Continuous planning and coordination, role modelling, work monitoring and deviation correction are the processes that positively influence safety (Grill & Nielsen, 2019).

Oah et al. (2018) argue safety leadership as "the process of interaction between leaders and followers, through which leaders could exert their influence on members to achieve organizational safety goals under the circumstances of organizational and individual factors". Leaders can take actions such as giving motivation, making policies and showing concerns in managerial efforts related to safety. These efforts are the process of shaping safety leadership.

Safety Communication

Safety communication is a part of internal organizational communication (Greeff, 2017). Communication is particularly important in unpredictable safety-critical environments. In this context, effective communication between supervisors and workers may minimize ambiguity and help workers to understand situations at work (Lingard, Zhang, et al., 2019). Safety communication is a central and decisive aspect of management when it comes to fostering a safety climate in the construction site (Greeff, 2017). Management is expected to use a variety of formal and informal communication methods to encourage and convey a safety commitment (Lingard, Pirzadeh, et al., 2019). Huang et al (2018) also considered safety communication as a distinct effect on safety outcomes as well as a contingency factor that determines the impact of safety climate on outcomes.

Safety communication in this study refers to the manager's actions related to communication, information, feedback, and promotion in organizational safety issue as defined by the workers. This variable captures the effectiveness of communication made by managers with workers formally and informally. Thus, it will be seen how the pattern of communication occurs between managers and employees related to safety in the work environment

Safety Climate

Safety climate is defined as workers' perceptions regarding their work environment. These perceptions may vary if there is perceivable change in the work environment (Newaz et al., 2018). Safety climate reflects workers' perceptions on priority to safety which is relative to other project goals (Lingard, Zhang, et al., 2019; Lu, Weng, & Lee, 2017). Safety climate has also been defined as "individual perceptions of policies, procedures, and practices related to safety in the workplace" (El, Scholar, & Bachir, 2018; Newaz et al., 2018).

Zhang, Pirzadeh, Lingard, & Nevin (2018) showed that safety climate fluctuates in a dynamic project environment over time. In recent years, the measurement of safety level has changed on the basis of retrospective data or so-called lagging indicators, such as the accident rate, which becomes a leading indicator for the measurement of safety climate (Newaz et al., 2018). Newaz also argued that this measurement is a great potential to timely predict accidents on construction sites. Zohar (1980) on He, Wang, & Payne (2017) used the term "Safety Climate" to describe employees' perception of their safety role in the organization. It is regarded as a descriptive measure that reflects employees perceptions and behavior.

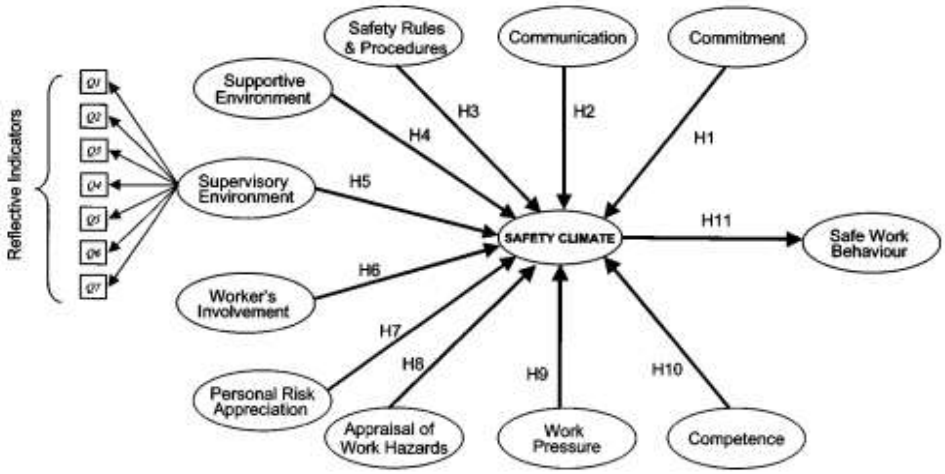

Figure 1: Reflective Safety Climate Indicators

Employees impression about safety is reflected on the three main roles of the industry regulation - managers, supervisors, and workers. Safety climate perceived by workers would be in the form of support from all major organizational actors. Failure in conformity has a significant correlation with employees perceived threat. Moreover, it can be related with the level of safety instructions received by workers.

Another perspective on safety climate indicators is the use of three competency dimensions: rules and procedures, social constraints, supervisory involvement (perception of competence and the presence of supervisors) (El et al., 2018). In an organizational unit, safety climate is obtained by collecting and averaging responses of individual employees to a safety climate scale. The level of safety climate in a given unit can therefore be high or low: when employees perceive a high safety-climate level, they consider that the organizational PPPs (policies, procedures, practices) hold commitment to safety. Safety climate means that the safety facet is considered highly importance in comparison with other aspects of the organizational climate. Safety climate is described in this study as a measure which employees assess for perceived safety policies, procedures and practices. In construction, this variable tries to capture the organization's safety-related conditions that is felt by workers in their work activities.

Safety Behavior

According to the theory of planned behavior by Ajzen (1991), the group norm is the predictor of behavioral breaches committed by individuals within the company (Fogarty & Shaw, 2010). Based on this theory, if workers are in a group with high safety standard, they will lack the courage to violate safety rules (Su, Cong, Cong, & Lian, 2019). Safety behavior is a component of Safety performance (El et al., 2018). Safety behavior means trust and attitude towards the importance of workplace safety, where these issues are closely related to the study of Safety climate and Safety Culture at work (Suo, Suo, & Zhang, 2019).

Safety behavior in this study is the workers' self-assessment regarding compliance behavior and participation in organizational safety regulations and procedures. In construction, this variable aims to capture the workers' behavior in complying with and implementing all kinds of regulations and procedures within the organization. Thus, Safety behavior may reflect the employees' behavior in their responsibilities towards workplace safety.

The Effect of Safety Leadership on Safety climate

Researchers who previously used this variable have found significant positive effect between Safety leadership and Safety climate. The more the leaders encourage employees to adopt behaviors to support safety, the higher the Safety climate in the work environment is (Fernández-Muñiz et al., 2017; L. Zhang, Chen, Li, Wu, & Skibniewski, 2018).

Wu, Chang, Shu, Chen, & Wang (2011) in their study also found a positive impact of Safety leadership on Safety climate. Leaders who directly influence safety to achieve safety goals of the organization may reduce the number of work accidents. The leader's style provides intellectual stimulation and recognition of achievements related to work safety. The stimuli then formed a working environment that deals with safety-related policies, procedures and practices so that people in the organization prioritize safety in every job they do. Safety climate may be formed afterwards and it can be seen that the higher the influence of the leader on safety is, the higher the Safety climate in the organization is.

H1: Safety leadership has significant effect on the Safety climate

The Effect of Safety Leadership on Safety Behavior

Safety leadership's influence on Safety behavior has been highlighted by researchers in the field of safety organizations. Several previous studies have found that leaders play an important role in establishing safety environment that can motivate workers to improve Safety behavior at work (Fernández-Muñiz et al., 2017; Grill & Nielsen, 2019; L. Zhang et al., 2018).

Safety-oriented leaders will direct their members to work according to the organization's safety standards. This is in accordance with the statement of Clarke (2000) on Grill & Nielsen (2019) who said that safety leadership is the determining factor of Safety behavior. The results of leadership behaviors that provide intellectual stimulation in terms of safety rewards significantly gives positive effect on the decrease of workplace accidents. Through it, leaders encourage employees to improve safety behavior. Furthermore, safety motivation and safety awareness as parts of safety leadership are also significantly related to safety behavior (Donovan, Salmon, Horberry, & Lenné, 2018). Results further emphasize that increased safety leadership will result in a good safety behavior and further reduce the number of accidents (Wu et al., 2011). Based on theory and previous research hypothesis above it can be derived as follows:

H2: Safety leadership has significant effect on the Safety behavior

The Effect of Safety Communication on Safety Climate

As indicated earlier, safety communication refers to manager's action related to communication, information, feedback, and promotion in organizational safety issue as defined by the workers. It reflects how effective the managers communicate with the employees in the work environment. Though scarce, a few studies have put concern on the effect of safety communication to safety climate. In a study by Zohar and Luria (as cited in Keffane, 2014) as supervisors build better interactions regarding safety issue with workers, workers' safet climate also increased. Another study about improving safety climate was also done by Sparer et al. (2016) in which their study found out that safety climate could be improved throufh a communication program. Based on theory and previous research hypothesis above, it can be derived as follows.

H3: Safety communication has a significant effect on Safety climate

The Effect of Safety Communication on Safety behavior

(Loosemore & Andonakis, 2007) found that organizations with a personal safety orientation were more likely to communicate and promote behavior that prevented accidents. The research shows that Safety communication has the influence of Safety behavior. Whereas in (Vinodkumar & Bhasi, 2010) communication of various types is used to increase the general effectiveness of every motivational effort. The scope and impact of communication will be higher in two-way communication and can cause behavioral changes. Regular communication about safety issues between management, supervisors, and workforce is an effective management practice to improve safety in the workplace. It also includes communication and feedback as a factor in surveys that use worker questionnaires and shows that Safety behavior is influenced by Safety communication within an organization (Vinodkumar & Bhasi, 2010), (Alsamadani et al., 2013), (Cigularov et al., 2010). Based on safety theory and previous researches, the following hypothesis can be derived:

H4: Safety Communication has a significant effect on Safety behavior

The Effect of Safety Climate on Safety Behavior

A study by Newaz, Davis, Jefferies, & Pillay (2018) found that Safety climate acts as a framework to guide employees achieve Safety behavior, thus influencing employees' safety behavior in the organization. Liu et al., (2015) also found that Safety climate has a positive effect on Safety behavior. It is known that if an organization has a good level of safety climate, it means safety becomes a priority. Prioritizing safety in an organization will then create and produce safety behavior of the individuals in the organization.

According to Social Identity Theory proposed by Tajfel & Turner (1999) on (Martiny & Rubin, 2016), part of one's self concept derives from experience of membership in a particular social group, which is accompanied by values, feelings, level of involvement, compassion and also pride in their group membership. Referring to the theory, when individuals are in working groups that emphasize work safety values, the individuals will feel involved and care about their groups, which in turn will enforce behaviors that prioritize work safety in their job because they understand what is considered important by the group.

Previous studies have reported a significant positive effect between Safety climate on Safety behavior. When an organization has a good Safety climate, the values and beliefs of safety can be well integrated into work life, which then has an impact on the increasing of Safety behavior (Mullen, 2004). Another study in the health care industry by Kath et al. (2010) also notes that there is a positive effect of Safety climate on Safety behavior. Based on the theory and some previous research above, the following hypotheses can be derived:

H5: Safety climate has significant effect on the Safety behavior

The Effect of Safety Leadership on Safety Behavior Mediated by Safety Climate

Through their study, Wu et al. (2011) prove that Safety leadership has a positive impact on Safety climate and Safety behaviour. In fact, Safety climate serves as a mediator between Safety leadership and Safety behaviour. Another study by Corcoles et al. (2011) also found that a positive Safety climate has a significant mediating effect on the leaders in terms of employee safety behavior. Leaders who emphasize the importance of safety will increase the Safety climate, which in turn will lead to an increase in employees' participation in safety and as a result, employees will apply Safety behavior. Based on safety theory and previous researches, the following hypothesis can be derived:

H6: Safety climate significantly mediates the effect of Safety leadership on Safety behavior

The Effect of Safety Communication on Safety Behavior Mediated by Safety Climate

The results of the study (Mohamed, 2002) and (D. Zohar, 1980) showed a significant positive relationship between Safety climate and Safety behavior. Furthermore Safety communication is one of the prerequisites for creating and

maintaining a positive Safety climate in the work environment (Mohamed, 2002). In (Loosemore & Andonakis, 2007) found that organizations with a personal safety orientation were more likely to communicate and promote behavior that prevented accidents from happening.

Based on safety theory and previous researches, the following hypothesis can be derived:

H7: Safety climate significantly mediates the effect of Safety communication on Safety behavior

CONCEPTUAL THEORIES

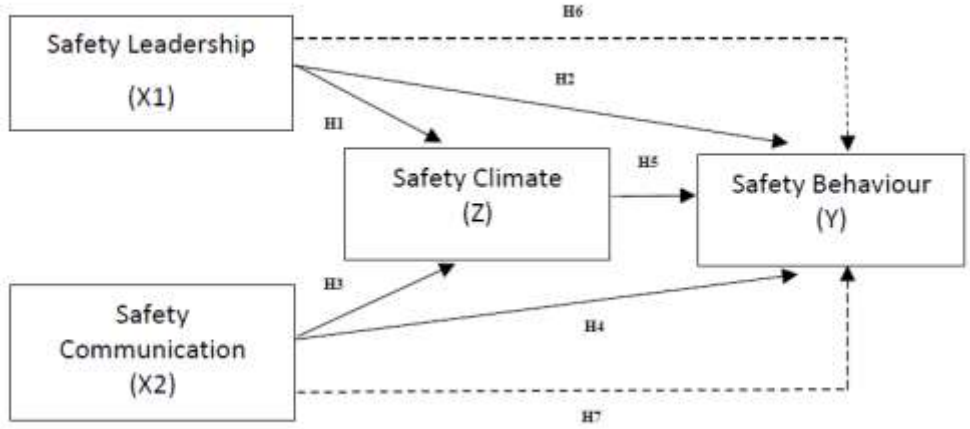

Figure 2: Research hypothesis

The figure above shows the hypothesis of this study. Safety leadership as the first variable affects the Safety climate as a mediating variable and Safety climate will eventually affect the Safety behavior. While Safety Communicaton as the second variable will affect the Safety climate and Safety climate will later affect the Safety behavior.

METHODS

Questionnaire and Sample

The method used in this study is a quantitative method to measure the impact of Safety leadership and Safety communication on Safety behavior with Safety climate as a moderating variable. According to Sugiyono (2016) quantitative research is a research method used to analyze a population or a particular sample, using a data collection instrument and quantitative data analysis or statistics to test the hypothesis set. It can also be considered as a deductive approach for a research (Rovai et al., 2014).

Quantitative researchers contend that by subdividing this reality into smaller, manageable pieces for the purposes of study, this reality can be understood. It is within these smaller subdivisions that observations can be made and hypotheses can be tested and replicated with regard to the relationships among variables. This approach is characterized by the researcher presenting a theory that is demonstrated in a particular hypothesis and then put to the test; conclusions can then be drawn on this hypothesis, after a set of observations and data analysis (Rovai et al., 2014). Sugiyono (2016) also stated that a quantitative research is "a research describing a research problem through the depiction of trends in the field to clarify the relationship among variables". Since the study uses quantitative research for the data collection, questionnaires are used, and the final outcome will be interpreted as statistics and presented in the form of graphs and tables.

This type of research is used by most researchers to explain a causal relationship. According to Sugiyono (2016), a causal relationship is a relationship that occupies both cause and effect of the independent variables (variables that affect) and the dependent variable (affected). Therefore, this study focuses on the influence of Safety leadership and Safety communication as the independent variables on Safety behavior as the dependent variable, and Safety climate as the moderating variable.

Population and Sampling

The research was conducted from November 2019 until February 2020 at PT Garuda Maintenance Facility AeroAsia (GMF) with the number of respondents was 342 people and spread throughout the departments in GMF.

According to (Sekaran, 2003), population is all values that may be the result of quantitative calculation or measurement of certain characteristics of all members in a complete and clear population set. According to Sugiyono, population is the entire object of research. Based on the statement above, the population in this study are all employees varying in ten departments at GMF with total 4,301 employees.

According to Singarimbun, sample is part of the population that has the main characteristics of the population and is used as a representation in research. Determination of research samples is by using proportional sampling technique which means taking samples with certain considerations (Sugiyono, 2013). The criteria used in this study were a sample of ten departments at GMF, recommendations that can be used to determine the minimum sample size are based on the complexity of the

model and the basic measurement characteristics of the model.

The size of the sample to be analyzed needs to be determined, since SEM requires 100-200 samples. Determination of the number of samples in this study, using Slovin calculations (Sevilla et al, 1960: 182) as follows:

$$\mathbf{n} = \frac{N}{1+N\,e^2}$$

Legends:

n = number of samples
N = number of populations
e = standard error, 0,05

Based on Slovin formula, it can be concluded:

n = N / (1 + (N x e²))
n = 2.400 / (1 + (2.400 x 0,05²))
n = 2.400 / (1 + (2.400 x 0,0025))
n = 2.400 / (1 + 6)
n = 2.400 / 7
n = 342

So, the sample of this study is 342 respondents. As for the distribution of samples using *proportionate stratified random sampling*, there are 5 contruct variable in this study, namely *Safety Leadership* (X1), *Safety Communication* (X2), *Safety Climate* (Z) *dan Safety Behavior* (Y).

Instrument

Research instruments and data, compiled and collected using a questionnaire list consisting of statements about the characteristics of respondents and questionnaires about the variables in this study. Questions are presented in the form of statements using metric data (Hair et al., 1995) in (Lu & Yang, 2010).

The scale used for the Safety Behavior variable is a scale of 1 (Never) to a scale of 5 (Always), while the scale used for Safety Leadership, Safety Communication, Safety Commitment, and Safety Climate is a scale of 1 (Strongly Disagree) to a scale of 5 (Strongly agree). As for the variable Safety Leadership, Safety Communication, Safety Commitment, and Climate Safety are strongly disagree, doubtful, agree, and strongly agree. After defining the theory from variable and indicators which mentioned above, then an instrument was formed which became the basis for making a questionnaire in this study.

Table 1: Research Instrument and Data

Safety Leadership (X1)	
Indicator	Number of Item
Safety Motivation	7
Safety Policy	4
Safety Concern	5
Safety Communication (X2)	
Indicator	Number of Item
Felt comfortable discussing safety issues with Supervisor	3
Felt their Supervisors openly accepted ideas for improving safety	2
Felt their Supervisors encouraged open communication about safety	2
Safety Climate (Z)	
Indicator	Number of Item
Knowledge	2
Skill	1
Abilities	1
Intelligence	2
Motives	2
Personality	2
Safety Behaviour (Y)	
Indicator	Number of Item
Safety Compliance	3
Safety Participation	1

Validity Test

Lissitz and Samuelsen (2007) suggested a new method to conceptualize the validity of the test, distinguishing the analysis of test properties from the analysis of the construct measured. Validity is concerned with the clarification and justification of the intended interpretations and uses of observed scores (Kane, Michael. 2000). Validity is the extent to which facts and theory endorse the test score interpretation entailed by proposed uses of tests. The validation process includes collecting evidence to provide a sound empirical foundation for the proposed score interpretations. (AERA, APA, NCME, 1999, p. 9). Question items can be said to be valid if they meet the requirements of r count> r table, on the contrary the instrument items are declared dropped (drop) if they have r count <r table. Based on the results for validation test, all of them have a value: r count> r table. So, all the variables in the research are valid.

Table 2: Validity Test

Safety Leadership			
No.	R Count	R Table	
1.	0,764	0,075	Valid
2.	0,816	0,075	Valid
3.	0,861	0,075	Valid
4.	0,744	0,075	Valid
5.	0,788	0,075	Valid
6.	0,863	0,075	Valid
7.	0,895	0,075	Valid
8.	0,882	0,075	Valid
9.	0,862	0,075	Valid
10.	0,840	0,075	Valid
11.	0,890	0,075	Valid
12.	0,821	0,075	Valid
13.	0,903	0,075	Valid
14.	0,892	0,075	Valid
15.	0,884	0,075	Valid
16.	0,875	0,075	Valid
Safety Communication			
No.	R Count	R Table	
1.	0,774	0,075	Valid
2.	0,82	0,075	Valid
3.	0,849	0,075	Valid
4.	0,895	0,075	Valid
5.	0,899	0,075	Valid
6.	0,826	0,075	Valid
7.	0,857	0,075	Valid
8.	0,888	0,075	Valid
Safety Behaviour			
No.	R Count	R Table	
1.	0,751	0,075	Valid
2.	0,786	0,075	Valid
3.	0,821	0,075	Valid
4.	0,840	0,075	Valid
5.	0,785	0,075	Valid
6.	0,832	0,075	Valid
Safety Climate			
No.	R count	R Tabel	
1.	0,825	0,075	Valid
2.	0,858	0,075	Valid
3.	0,841	0,075	Valid
4.	0,712	0,075	Valid
5.	0,756	0,075	Valid
6.	0,888	0,075	Valid
7.	0,900	0,075	Valid
8.	0,843	0,075	Valid
9.	0,853	0,075	Valid
10.	0,845	0,075	Valid

Reliability Test

The reliability test was carried out using the Alpha Cronbach technique, which is a technique by calculating the value of a valid variance, then calculated using the Alpha Cronbach ramus. The results of calculating the reliability of the instrument using the Alpha Cronbach formula technique obtained the reliability value of the Safety Leadership research instrument, $r_{11} = 0.958$, Safety

communication research instrument, r_{11} = 0.935, Safety Behavior research instrument, r_{11} = 0.758 and Safety Climate research instrument r_{11} = 0.12. According to Supriyadi (2014) states that a construct or variable is reliable if it has a Cronbach Alpha value above 0.70. This value indicates that all the instrument is reliable because r_{11} = > 0.70. (See Figure 3). The letter adopted the cornbach alpa coefficient. Analysis showed that these four scales possess a very good construct validity and internal consistency.

Table 3: Reliability Test

	Variable	Number of items	Cronnbach's Alpha
X1	Safety Leadership	16	0,958
X2	Safety Communication	7	0,935
Y	Safety Behavior	6	0,758
Z	Safety Climate	10	0,912

Analysis

This research is using Structural equation modeling (SEM) with AMOS 24.0 to test the hypothesized model. Structural equation modeling (SEM) is a statistical method increasingly used in scientific studies in the field of social sciences in recent years (Civelek, 2018). The most important reason for the spread of this statistical technique is that the direct and indirect relationships among causal variables can be measured with a single model (Meydan & Şen, 2011). Structural equation modeling is a statistical method used to test the relationships between observed and latent variables. Observed variables are the measured variables in the data collection process and latent variables are the variables measured by connecting them to the observed variables because they can not be directly measured. Structural Equation Modeling consists of two basic components namely structural model and measurement model. This study adopted a two-stage analytic strategy by Civelek (2018) that is a comprehensive test for the hypothesis depicted in Figure 3. According to this strategy, the measurement model is first confirmed using Confirmatory Factor Analysis (CFA), then SEM is done based on the measurement model to estimate the suitability of the model hypothesized by the data. To measure the suitability of the model, chi-square value (2) is reported as absolute compatibility index, which assesses the extent to which the estimated covariance with covariates in the model fits the measured variables (Kline, 1998). In addition, this study also reported a Comparative Fit Index (CFI), Good of Fit Index (GFI), the Standardized Root Mean Square Residual (SRMR), and the Root Mean Square Error of Approximation (RMSEA) to measure the fit model. It shows the index to which the research model provides enhanced overall suitability relative to zero models or model of independence in which the correlation between the observed variables is assumed to be zero. CFI and GFI have been regarded as the best estimates of population values for a single model, with values greater than or equal with .90 and considered as an indication of a good match (Medsker, Williams, & Holahan, 1994). SRMR is a summary of the standard of the average covariance residue; favorable values of less than 0.10 (Kline, 1998). RMSEA is a measure of fit that compares the mean differences of each expected degree of freedom that can occur in the population with each other (Civelek, 2018). This scale is adversely affected by sample size. A value of 0.05 or less for the RMSEA fit indice indicates good fit. Values between 0.05 and 0.08 indicate acceptable fit.

RESULTS AND DISCUSSION

The main purpose of this study is to integrate leadership and commnunication factor to investigate the relationship between safety leadership and communication, as well as safety climate and safety behaviors, among employees. This study makes a unique contribution to the existing body of safety research and in the context of MRO industry. The results indicate that safety leadership and communication have a direct effect on safety behaviors via the safety climate. In addition, the relationship between safety leadership and communication is moderated by the level of the safety climate. These results can serve as useful references for the development approached in the future.

Table 4: Descriptive Statistics

Characteristics	Classification	Total
Gender	Man	288 (84%)
	Woman	54 (16%)
Age	<21 years	3 (1%)
	21-30 years	137 (40%)
	31-40 years	37 (11%)
	41-50 years	81 (24% 0
	> 50 years	84 (25%)
Last education	Senior High School	116 (34%)

	Diploma 2	22 (6%)
	Diploma 3	65 (19%)
	Bachelor's degree	114 (33%)
	Master's degree	25 (7%)
Length of work	1-5 years	125 (37%)
	6-10 years	65 (19%)
	> 10 years	152 (44%)

Table 4 shows that the object studied are as many as 342 people and are dominated by men as many as 288 people, while the number of the woman is 54. The age of the respondents is dominated by the range of 21-30 years old, 137 people (40%). Over 50 years old are 84 people (25%). Age 41-50 years old are 24% or as many as 81 people. Followed by 11%, 37 people aged 31-40 years old, and 1% are aged less than 21 years old or a total of 3 people.

Last education level of the respondents are Senior High School, Diploma 2, Diploma 3, Bachelor Degree, and Master Degree with the percentage of each is 34%, 6%, 19%, 33% and 7%. Working period of the respondents is divided into 3, 1-5 years, as many as 125 people (37%); 6-10 years as many as 65 people (19%) and the major numbers are workers who have worked for more than 10 years, that is 152 people (44%). This research questionnaires were distributed to all departments in GMF.

Table 5: Regression Weights: (Group number 1 - Default model)

			Estimate	SE	CR	P	Label	Note
SClim	←	SL	, 176	, 084	2,083	, 037	par_1	Significant
SClim	←	Scom	, 343	, 078	4.379	***	par_2	Significant
SB	←	Sclim	, 611	, 044	13.759	***	par_3	Significant
SB	←	SL	, 029	, 070	, 417	, 677	par_4	Not significant
SB	←	Scom	, 071	, 066	1,082	, 279	par_5	Not significant

If t is greater than 1.96 then the state variables have a significant effect. Table 5 shows that the safety leadership variable significantly influences the safety safety climate variables with t-count value is greater than 1.96 and equal to 2,083. Safety communication variable also significantly influences the safety climate, with a t-test value of 4.379. Safety climate variable to safety behavior variable has t value of 13.759 so safety climate significantly influences safety behavior. For the safety leadership variable to safety behavior variable, has t-value of 0.417 and safety communication to safety behavior has t-value of 1,082. With the value t count, these two variables' value are less than 1.96 which mean the effects are not significant.

Confirmatory Factor Analysis

Confirmatory analysis (Confirmatory Factor Analysis) was used to test the validity of theoretical constructs. The main concepts used in this case is the measurement, validity and reliability. Of the four latent variables in this study, the test will be conducted using a uni-dimensional factor analysis method to determine the validity, reliability, as well as the contribution made by each variable indicator in developing the latent variables. Statistics test for confirmatory factor analysis is the t distribution. Indicator to measure the latent variable is said to be significant if the t-value > 1.96. The result is safety leadership, safety climate, safety communication and safety behavior variables are statistically significant.

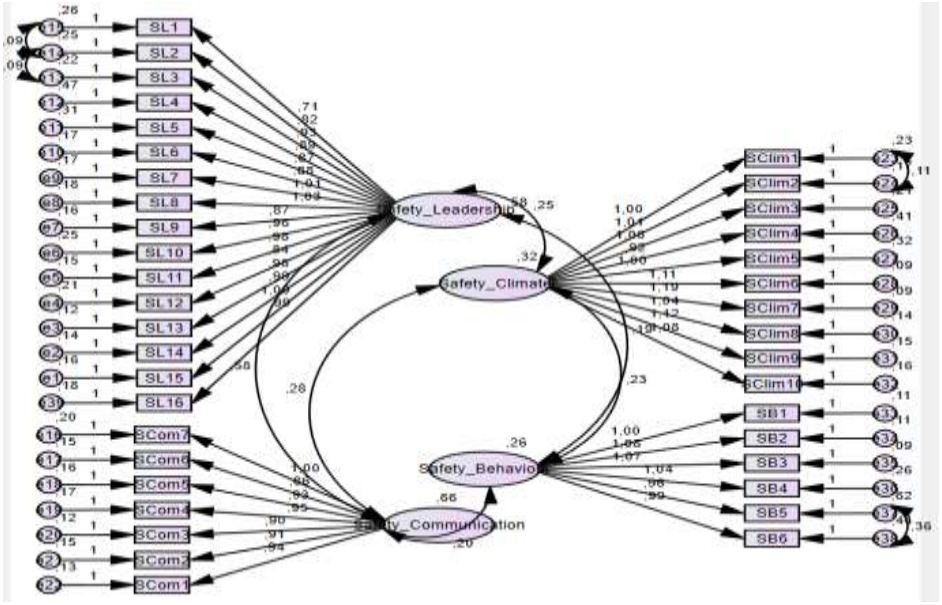

Figure 3: Structural Model

Table 6: Fit Model Measures

Measure	Estimate	Interpretation
CMIN	1775.267	-
DF	655,000	-
CMIN / DF	2,710	Excellent
CFI	.921	Acceptable
SRMR	0.068	Excellent
RMSEA	0,071	Acceptable
pclose	0,000	not Estimated
GFI	.771	Acceptable

RMSEA (Root Mean Square Error of Approximation) explains residues contained in the model. The magnitude of the expected value of RMSEA ≤ 0.05. RMSEA value ≤ 0.05 indicates a close fit, and if the value is in the range of 0.05 < RMSEA $\leq$ 0,08 models can still be accepted as a fit model (good fit) (Browne & Cudeck, 1993). In this study, a value of 0.071 which means it is a close model fit.

CFI (Comparative Fit Index) is a ratio of models arranged with the ideal model. CFI expected value is above 0.90 (Hooper, Coughlan, & Mullen, 2008). In this study, the CFI value of 0.921 means that the model can be accepted.

GFI (Goodness Fit Index) including suitability index models are often used as a reference for fit assessment model. GFI is an index of accuracy of the model in explaining models arranged. To determine the model fit by GFI, GFI expected value is ≥ 0.90. GFI value has a range of values between 0.00 (poor fit) to 1.00 (perfect fit) (Joreskog & Sorbom, 1993). In this study the obtained value of 0.771, means a good model fit. The three criteria suggest a good model fit.

Regression results with mediating variables (Sobel test)

Sobel test was conducted to determine the indirect effect between the independent variables and the dependent variable through mediating variable.

Safety leadership (SL) toward Safety behavior (SB) with Safety climate as the mediating variable (SClim)

Coefficient SL > SClim = 0.176 (a)
Coefficient SClim > SB = 0.611 (b)
SE SL > SClim = 0.084 (sa)
SE SClim > SB = 0.044 (sb)

$$sab = \sqrt{b^2sa^2 + a^2sb^2 + sa^2sb^2}$$
$$sab = \sqrt{(0{,}611^2)(0{,}084^2) + (0{,}176^2)(0{,}044^2) + (0{,}084^2)(0{,}044^2)}$$
$$sab = \sqrt{0{,}002708}$$

$$sab = 0{,}052$$

$$t = \frac{ab}{sab} = \frac{(0{,}176)(0{,}611)}{0{,}052} = 2{,}067$$

Because t > t table or 2.067 > 1.96; then the indirect effect is significant / mediation. That is, the Safety leadership has a significant effect on Safety behavior through Safety climate, or partially mediates.
Safety communication (SCOM) toward Safety behavior (SB) with Safety climate as the mediating variable (SClim).
Coefficient SL > SClim = 0.343 (a)
Coefficient SClim > SB = 0.611 (b)
SE SL > SClim = 0.078 (sa)
SE SClim > SB = 0.044 (sb)

$$sab = \sqrt{b^2sa^2 + a^2sb^2 + sa^2sb^2}$$
$$sab = \sqrt{(0{,}611^2)(0{,}078^2) + (0{,}343^2)(0{,}044^2) + (0{,}078^2)(0{,}044^2)}$$
$$sab = \sqrt{0{,}0051}$$
$$sab = 0{,}050$$

$$t = \frac{ab}{sab} = \frac{(0{,}343)(0{,}611)}{0{,}050} = 4{,}182$$

Because t > t table or 4.182 > 1.96; then the indirect effect is significant / mediation. This means that Safety communication significantly influences the Safety behavior through Safety climate, or partially mediates.

Table 7: Standardized Regression Weights: (Group number 1 - Default model)

			Estimate
SClim	<---	SL	, 204
SClim	<---	SCOM	, 428
SB	<---	SClim	, 646
SB	<---	SL	, 036
SB	<---	SCOM	, 094

** Information:*
CR (Critical Ratio) significant is > 1.96
*Sig P value received is the range *** (p = 0.001) or > = 0.05*
Note: This table is used to determine whether there is a positive or negative effect on the variable

CONCLUSIONS

Based on the results calculated using SEM and using p, it can be concluded that, safety leadership has positive effect on the safety climate standard with a coefficient of 0.204. Furthermore, it can also be concluded that the higher the level of Safety leadership is, the higher the level of safety climate is. H1 is then accepted. For H2, safety leadership shows a significant effect on safety behaviour. Based on the results calculated using one tail with a significant p value = 0.001 and p standard coefficient = 0.036, it can be concluded that safety leadership does not have significant effect on safety behaviour. Thus, H2 is not accepted. Next, safety communication is proved to have significant effect on safety climate with a coefficient of 0.428. As a conclusion, the higher the safety communication level is, the higher the safety climate is. H3 is then accepted. For H4, safety communication has a significant effect on safety behaviour. Based on the results, the p standard coefficient is 0.094, which means safety communication does not significantly influence safety behaviour. Thus, H4 is not accepted. For H5, safety climate shows a significant effect on safety behavior. Based on the results calculated using one tail with a significant p value = 0.001 and p standard coefficient = 0.646, it can be concluded that safety climate has a positive effect on safety behavior, H5 is then accepted. For H6 and H7 regarding the mediating role of safety climate, the results are both significant. Thus, it can be concluded that safety leadership has a significant effect on safety behaviour through safety climate as the mediating variable. Safety communication significantly influences safety behaviour through safety climate as the mediating variable. Moreover, greater effort could be made by the organization through improvement in safety leadership and communication that will lead to positive safety work climate in the organization. This improvement will also help to create a high-level of safety behaviour in the work environment and decrease the incident in the workplace.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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