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Determinants of Safety Citizenship Behavior: A Case Research of Operation Employees at Kereta Api Indonesia (Persero)

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ABSTRACT

Train accident statistics show that risky behavior continues to occur, both in the form of violations of standard operating procedures and poor safety behavior by Indonesian Railways (KAI) operational staff, which can lead to accidents. Therefore, a more in-depth examination of the variables that influence Safety Citizenship Behavior (SCB) is needed. This research aims to analyze the effect of safety procedures and safety motivation on SCB, with safety leadership as a moderating variable. Data was collected from August to December 2024 using the Partial Least Square (PLS) based Structural Equation Model (SEM) technique in Bandung Operation Area 2. The research sample consisted of 143 randomly selected employees. The results showed that social capital has a significant influence on safety citizenship behavior, while safety motivation does not show a significant influence. However, safety leadership was proven to moderate the influence of safety motivation on SCB, increasing the effectiveness of safety motivation in encouraging this behavior. These findings demonstrate the importance of developing an appropriate safety leadership model to improve safety behavior and reduce dangerous activities in KAI. By understanding the factors that influence SCB, it is hoped that KAI can improve operational safety and employee welfare.

Keywords : safety citizenship behavior, safety leadership, safety motivation, social safety capital

INTRODUCTION

Trains are one of the primary forms of transportation that are crucial to daily passenger mobility and the distribution of products in many nations, including Indonesia (Marlina & Natalia, 2017; Meyer, 2016; Vuchic, 2017). In the railway industry, performance encompasses a number of factors, including operational effectiveness, safety, and security. In addition to improving worker and passenger safety, strong safety performance in the railway industry has wider social, economic, and environmental advantages. As a result, railway safety performance needs to be continuously maintained and enhanced.

Since railway safety is an essential component of the transportation system's operational activities, the railway sector has seen a number of technological advancements in recent decades that have attempted to increase safety (Bagloee et al., 2016; Batarlienė, 2020; Lanori & Supriyanto, 2023). It is anticipated that increased oversight, upkeep of the infrastructure, and application of contemporary technology will all contribute to increased railway safety. The human element is still a big obstacle that must be addressed in order to lower human mistake in the future, even with tremendous efforts to increase railway safety. While technology can help reduce the likelihood of

accidents, it cannot provide complete safety. Although advanced, safe facilities and a technology-based safety management system have been put in place to prevent accidents, they are thought to be less effective and produce less than ideal results because humans still play a part in the process, making it prone to error (Cheng & Tian, 2020; Liu et al., 2019).

Human factors-related safety concerns continue to be a significant issue in the railroad sector. As a result, it is anticipated that the human resources component would be crucial to enhancing railway safety. According to a meta-analysis research by Christian et al. (2009), accidents and incidents (damage) in a number of industrial sectors that were brought on by technical malfunctions have declined globally, but one of the primary causes of accidents is poor safety behavior (human factors). Companies can lower the risk of accidents and work-related injuries, boost productivity, and improve employee well-being in the workplace by promoting positive safety behavior among employees. Safety behavior is crucial to establishing a safe and healthy work environment (Zhang et al., 2020).

Beyond following current policies and procedures, people can take voluntary steps to promote safety in the workplace as part of Safety Citizenship Behavior (SCB), according to Curcuruto and Griffin (2018). Another name for Safety Citizenship Behavior (SCB) is a high-level construct that encompasses a range of proactive workplace actions intended to increase safety and lower the probability of accidents. Along with preventing workplace accidents and injuries, SCB plays a major role in a company's safety program's success by fostering a safety culture, raising safety awareness and performance, and promoting innovation and constructive change in safety improvement initiatives, all of which will eventually boost worker productivity and general well-being (Curcuruto & Griffin, 2018; S. Li et al., 2020). Therefore, in order for companies to create strategies that effectively promote positive safety behavior (SCB) in the workplace, it is vital to better understand and research the aspects that can influence SCB.

Because it can raise safety awareness, promote safety behavior, enhance communication, create a safety culture, and boost safety competence, social safety capital is an important factor when it comes to occupational safety and safety behavior in the workplace (M. Li et al., 2020). According to Zhang et al.'s (2020) research, social safety capital is one of the key elements that can boost workplace safety efforts (also known as safety citizenship behavior). People who have high social safety capital are more likely to engage in safety behavior, exchange information, and assist one another in establishing a safe and healthy work environment.

H1: Social safety capital influences safety citizenship behavior.

In keeping with research by Xia et al. (2020) that highlights the significance of safety motivation in promoting positive safety behavior, Neal and Griffin (2006) claimed that safety motivation contributes to the improvement of safety behavior in the workplace and the gradual encouragement of active participation in safety activities. Employees are more likely to recognize and report possible risks, take part in safety training, and take preventive measures to safeguard themselves and their coworkers when they are highly

motivated to maintain safety (Zhang et al., 2020). Therefore, lowering accidents and enhancing workplace safety can be achieved by comprehending and fostering safety motivation among employees.

H2: Safety motivation influences safety citizenship behavior.

Leaders who value safety and cultivate a strong safety culture can inspire employees to take proactive steps to ensure their own and their colleagues' safety. This is known as effective safety leadership, and it can have a positive impact on employee safety citizenship behavior. Workers are more likely to take an active role in safety initiatives when they perceive that safety leadership is guiding and supporting them.

According to Li et al. (2020), staff Safety Citizenship Behavior (SCB) is significantly impacted by safety leadership. Mechanisms including role models, communication, support, acknowledgment, and involvement can be used to understand how safety leadership affects Safety Citizenship Behavior (SCB). Leaders may influence employees' positive safety attitudes and encourage them to take proactive steps to ensure workplace safety by implementing safety-supportive leadership practices.

H3: Safety leadership moderates the influence of safety motivation on safety citizenship behavior.

This research has significant novelty compared to previous studies because it focuses on the role of safety leadership as a moderating variable between safety motivation and Safety Citizenship Behavior (SCB) among operational employees of Kereta Api Indonesia (KAI). While many previous studies have identified a direct relationship between these factors, this research explores how safety leadership can strengthen or weaken the influence of safety motivation on SCB. Thus, this research provides new insights into the importance of leadership strategies in building a culture of safety and proactive behavior in the workplace.

The purpose of this research is to analyze the influence of social capital, safety motivation, and safety leadership on safety citizenship behavior among employees of PT Kereta Api Indonesia (KAI). The benefits of this research include an increased understanding of the factors that influence safety behavior, which can help management design more effective training programs and safety policies. The implications of the results of this research show that by improving social capital and safety leadership, organizations can promote better safety behavior, thereby reducing the risk of accidents and increasing the productivity and welfare of employees in the workplace.

RESEARCH METHOD

Human resource management practices are the subject of this research. The independent factors (X) are safety motivation and social safety capital, while the dependent variables (Y) are safety citizenship behavior and safety leadership, which are also known as moderating variables (M). This research is a kind of quantitative research that uses the survey research method to examine preexisting hypotheses. This research falls under the category of cross-sectional research, which involves gathering data at a certain moment in order to address research questions and provide a picture of an event

that occurred within a given time frame. This research was carried out at PT Kereta Api Indonesia (Persero), a business that provides transportation services.

The personnel of Daop 2 Bandung that are the subject of this research include both train crew members and non-train crew members (those who work in the station area) who are involved in railway operations. Human factors-related safety problems continue to be a significant concern. A list of previously prepared written questions with space for responders to record their responses is called a questionnaire (Sekaran & Bougie, 2016). The research's questionnaire consisted of comments and questions that were sent straight to participants. A Likert scale from 1 to 5 was utilized in the research's questionnaire. A link to a Google Form and instructions for completing the survey will be emailed to each respondent by business email or social media (WhatsApp or WhatsApp group). In other words, primary data for this research will be gathered via an online survey approach in the form of a questionnaire. Researchers can get data more quickly by using online surveys (Ball, 2019).

This research was aimed at 394 people in the KAI Daop 2 Bandung operating unit, which included 143 station employees, 22 train operation control center employees, 180 machinists, and 49 machinist assistants. The total population was 394 people. Sampling in this research was carried out using the probability sampling technique, which is a procedure that ensures that each element in the known population is given the opportunity to be selected as a sample. After the number of samples is known, the next step is to determine the number of samples proportionally in each sub units. The proportion allocation formula used is as follows:

$$nh = \frac{Nh}{N} . n$$

nh = number of sample members based on strata
Nh = number of population members based on strata
N = population
n = total number of sample members

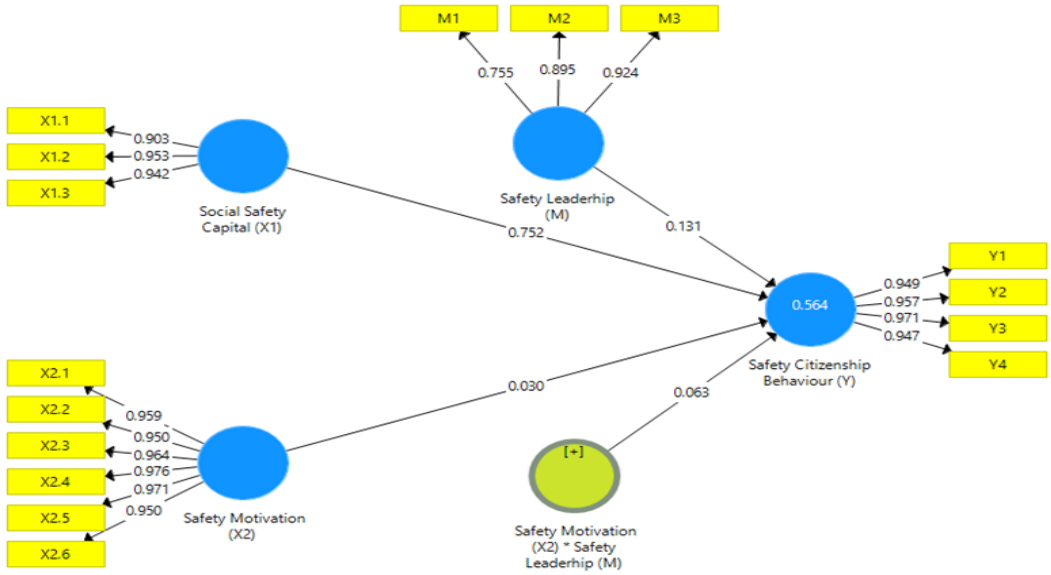
Thus, the samples obtained for each sub-unit were 52 station employees, 2 train operation control center employees, 83 machinists, and 6 machinist assistants. The total sample in this research was 143 people. The components of social capital—trust, interdependence, social norms, and cooperation—allow people or groups to collaborate successfully in order to accomplish shared objectives. The method by which a leader interacts with their subordinates in order to persuade them to accomplish safety objectives in both an organizational and personal setting is known as safety leadership. Employees that engage in Safety Citizenship Behavior (SCB) voluntarily and pro-socially support workplace safety. An ordinal scale is used to measure each variable.

Using the SmartPLS tool, the Structural Equation Model (SEM) approach based on Partial Least Square (PLS) was employed as the data analysis method in this research. The structural model, also known as the inner model, is a stage for model testing that demonstrates how the constructs are related to one another in order to ultimately provide

an answer to the problem formulation (hypothesis testing), whereas the measurement model (outer model) is a stage for instrument testing that represents how the measured variables represent the construct.

RESULT AND DISCUSSION

A model evaluating the impact of social safety capital and safety motivation on safety citizenship behavior modulated by safety leadership is derived from the SEM-PLS calculation findings.



All loading factor values that show the association between observed variables (manifest) and variables over 0.7 are known to exist based on the computation results. Therefore, it can be said that the research's validity is good for each of its constructs. To further support the findings of convergent validity, AVE testing will be conducted. According to Jourdan et al. (2020), the construct employed in the research is valid if the AVE value is greater than 0.5. To assess the construct reliability, Cronbach's alpha and composite reliability are used. According to Jourdan et al. (2020), a construct is considered reliable if its composite reliability and Cronbach's alpha are both higher than 0.70. The outcomes of the model's AVE and reliability testing are as follows.

Table 1. AVE, Cronbach's Alpha and Composite Reliability

	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Safety Motivation (X2)	0,984	0,987	0,925
Safety Motivation (X2) * Safety Leadership (M)	1,000	1,000	1,000
Safety Citizenship Behaviour (Y)	0,969	0,977	0,914
Safety Leadership (M)	0,988	0,895	0,742
Social Safety Capital (X1)	0,926	0,953	0,871

Table 2. Cross Loadings

	Social Safety Capital (X1)	Safety Motivation (X2)	Safety Leadership (M)	Safety Citizenship Behaviour (Y)
X1.1	**0,903**	-0,152	0,039	0,737
X1.2	**0,953**	-0,171	-0,060	0,666
X1.3	**0,942**	-0,183	-0,084	0,650
X2.1	-0,159	**0,959**	0,175	-0,087
X2.2	-0,177	**0,950**	0,217	-0,098
X2.3	-0,199	**0,964**	0,142	-0,123
X2.4	-0,167	**0,976**	0,179	-0,088
X2.5	-0,177	**0,971**	0,154	-0,117
X2.6	-0,153	**0,950**	0,146	-0,121
M1	-0,064	0,203	**0,755**	-0,030
M2	-0,061	0,205	**0,895**	0,018
M3	-0,051	0,200	**0,924**	0,032
Y1	0,671	-0,129	0,107	**0,949**
Y2	0,714	-0,115	0,065	**0,957**
Y3	0,724	-0,106	0,098	**0,971**
Y4	0,706	-0,080	0,117	**0,947**

Tables 1 and 2 demonstrate that every latent variable has an AVE value greater than 0.5. This suggests that there is strong convergent validity among the indicators that make up the latent construct. The cross-loading value's discriminant validity indicates that, in comparison to other constructs, the indicator has a strong correlation with its construct. Thus, the discriminant validity cross loading indicates that the research model has strong discriminant validity. Furthermore, every latent construct has a Cronbach's alpha value greater than 0.7, indicating that it is a reliable construct. Furthermore, all of the latent constructs' composite reliability values are higher than 0.70. The model exhibits good reliability, according to the Cronbach's alpha and composite reliability values that were found. The inner model testing, which includes R-square, f-square, Q-square, and GoF, comes after the outer model testing is completed. The following are the r square values that were found.

Tabel 3. R-square

Variable	R Square
Safety Citizenship Behavior (Y)	0,564

According to Table 3 above, the r-square value of safety citizenship behavior is 0.564. This indicates that safety leadership moderates the impact of social safety capital and safety motivation on safety citizenship behavior by 0.564, or 56.4%, while other factors not included in this research have an influence of 43.6%. When the influence falls into the large group, the f-square value of social safety capital on safety citizenship behavior is 1.224. The influence falls into the minor group, with an f-square value of 0.002 for safety motivation on safety citizenship behavior. The influence falls into the minor group, with an f-square value of 0.013 for safety motivation on safety citizenship behavior regulated by safety leadership. Additionally, the following is the Q-squared value that was found.

Tabel 4. Q-square

	SSO	SSE	Q^2 (=1-SSE/SSO)
Social Safety Capital (X1)	1350,000	1350,000	
Safety Motivation (X2)	2700,000	2700,000	
Safety Leadership (M)	1350,000	1350,000	
Safety Motivation (X2) * Safety Leadership (M)	450,000	450,000	
Safety Citizenship Behaviour (Y)	1800,000	879,601	**0,511**

The Q square value is greater than 0, which indicates that the observed values have been accurately reconstructed and that the structural model has predictive relevance, according to the computation findings above. In the structural model, the GoF value is 0.511. According to these findings, the structural model's GoF falls into the good range. Additionally, the t-statistic value is compared to the t-table, which is 1.96, or the p-value is compared to α 5% and 10% or 0.05 and 0.1 in order to perform hypothesis testing. The findings of the structural model hypothesis testing are shown in the table below.

Tabel 5. Hypotheses Testing Result

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values	Decision
Social Safety Capital (X1) -> Safety Citizenship Behavior (Y)	0,752	0,751	0,056	13,480	0,000	Reject H_0
Safety Motivation (X2) -> Safety Citizenship Behavior (Y)	0,030	0,035	0,049	0,619	0,536	Accept H_0
Safety Leadership (M) -> Safety Citizenship Behavior (Y)	0,131	0,050	0,060	2,181	0,030	Reject H_0
Safety Motivation (X2) * Safety Leadership (M) -> Safety Citizenship Behavior (Y)	0,063	0,046	0,031	2,050	0,041	Reject H_0

Based on the results of testing four hypotheses, it is known that only one hypothesis is accepted. The four hypotheses are as follows.

a. Safety citizenship behavior is significantly impacted by social safety capital, with a p-value of 0.000 <0.05, which is less than the alpha 5%. Social safety capital has a positive relationship with safety citizenship conduct; that is, the more social safety capital there is, the better the safety citizenship behavior.
b. Safety citizenship behavior is not significantly impacted by safety motivation, as indicated by the p-value of 0.536>0.05, which is higher than the alpha 5%. Safety citizenship conduct and safety motivation have a positive relationship; that is, the more safety citizenship behavior there is, the greater the safety motivation.

c. Safety citizenship behavior is significantly impacted by safety leadership, with a p-value of 0.030 <0.05, which is less than the alpha 5%. Safety leadership has a positive impact on safety citizenship conduct; that is, the more effective the safety leadership, the better the safety citizenship behavior.
d. Safety leadership moderates the significant relationship between safety motivation and safety citizenship conduct, with a p-value of 0.041 <0.05, below the alpha 5% threshold. In the meantime, safety leadership increases the impact of safety motivation on safety citizenship behavior; prior to being moderated by safety leadership, the influence of safety motivation on safety citizenship behavior was 0.030 (not significant), but following moderated by safety leadership, it was 0.063 (significant)

In the discussion of the research results, there are several key findings that need to be interpreted to provide a better understanding of the implications of the results obtained. First, the research shows that social safety capital has a significant effect on safety citizenship behavior with a p-value of 0.000, which is much smaller than alpha 5%. This indicates that the better the social safety capital implemented in an organization, the more employee safety citizenship behavior will increase. The implication of this finding is the importance of management to increase social capital in the context of safety, for example through training, effective communication, and building trust among team members.

Second, safety motivation does not show a significant effect on safety citizenship behavior with a p-value of 0.536, which is greater than alpha 5%. This means that safety motivation alone is not enough to encourage safety citizenship behavior. This finding suggests that organizations need to consider other factors that can increase motivation, such as awards or recognition for good safety behavior. Furthermore, this research found that safety leadership has a significant effect on safety citizenship behavior with a p-value of 0.030. This shows that good leadership in the safety aspect can improve safety citizenship behavior. Therefore, training for leaders to develop skills in promoting safety in the workplace is very important.

Interestingly, safety leadership also acts as a moderator between safety motivation and safety citizenship behavior. After being moderated, the effect of safety motivation becomes significant (p-value 0.041). This shows that when safety leadership is improved, employee safety motivation can be more effective in encouraging safety citizenship behavior. The implication of this result is the importance of collaboration between management and leaders to create a work environment that supports safety.

Overall, the results of this research indicate that the combination of social safety capital, safety leadership, and safety motivation has a significant effect on safety citizenship behavior. Therefore, recommendations for future research are to explore additional variables, such as stress levels and workload, which can provide a more comprehensive picture of the factors that influence safety behavior in the workplace. By understanding these results, organizations can formulate more effective strategies to improve occupational safety and health, which in turn can have a positive impact on employee productivity and satisfaction.

CONCLUSION

This research shows that social capital has a significant influence on safety citizenship behavior with a p value of 0.000, which indicates that increasing social capital in the organization will encourage an increase in employee safety behavior. Meanwhile, safety motivation did not show a significant influence on safety citizenship behavior, with a p value of 0.536, which means that safety motivation alone is not enough to encourage such behavior; organizations need to consider other factors that can increase motivation, such as rewards or recognition for good safety behavior. In addition, safety leadership has a significant effect on safety citizenship behavior, with a p value of 0.030, indicating that good leadership in safety aspects can increase such behavior. Safety leadership also acted as a moderator between safety motivation and safety citizenship behavior; after moderation, the effect of safety motivation became significant with a p value of 0.041, indicating that improving safety leadership can make employee motivation more effective in promoting safety behavior. Overall, the combination of social capital, safety leadership and safety motivation has a significant influence on safety citizenship behavior, so this research suggests the importance of collaboration between management and leaders to create a work environment that supports safety. Future research can explore additional variables that can influence safety citizenship behavior, such as stress levels, workload, and organizational culture. Longitudinal studies can provide insights into how safety citizenship behavior evolves over time with changes in leadership style or safety initiatives. In addition, qualitative research methods, such as interviews or focus groups, can complement quantitative findings and provide deeper insights into employees' perceptions and experiences of workplace safety behavior.

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