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Safety Leadership, Covid-19 Risk Perception, and Safety Behavior: The Moderator Role of Work Pressure

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ABSTRACT

This research examines how safety leadership, workers' risk perception of Covid-19, safety motivation, and work pressure affect safety compliance and safety participation behaviors. A survey questionnaire was distributed to 967 production workers from eight garment and footwear enterprises in Vietnam in 2021. The data analysis of the survey was analyzed using SPSS and SmartPLS. The results of the Structural Equation Modeling technique indicate that all three safety leadership factors (participative management, safety concern, and safety incentive) & risk perception of Covid-19 have a direct, positive influence on both safety motivation and worker's safety behaviors (safety compliance and safety participation behaviors), except that safety incentive does not predict safety participation behavior. Safety concern has the greatest impact on safety compliance behavior, whereas participative management has been identified as the most important factor affecting safety participation behavior. It was also found that work pressure acted as a moderator in explaining the relationship between safety motivation and worker safety compliance behavior.

1. INTRODUCTION

The garment and footwear industry accounts for a large proportion of the economic structure of Vietnam. However, according to the Vietnam national statistical report on the number of fatal occupational accidents, the garment and footwear industry was in the top five manufacturing sectors that accounted for the most fatal accident cases with 10.53% in 2018 and 5.5% in 2020 [1]. Further investigating these reports, the aggregate analysis of the causes of fatal accidents for all industries reveals that the percentage of total cases caused by employees violating occupational health & safety standards and procedures tends to increase from 18.42% in 2018 to 23.85% in 2020. It shows that although there has been a lot of effort to ensure occupational health and safety, the level of safety violations increases with the development of the industry. Therefore, improving the effectiveness of health & safety strategies becomes imperative for the garment and footwear businesses.

Safety leadership has been investigated in various sectors and industries (e.g., aeronautics, construction, refining, petrochemicals, container operations, etc.) and is a positive driver of safety performance [2-5]. Recent studies revealed that continued support by leadership and management team (participating in safety audits, site visits, and safety communication with workers, etc.) are key factors affecting the safety behavior of employees and determines the success of the safety management system [4-6]. However, few studies explored how leaders should involve and interact with inferiors to enhance safety performance. So, the author aims to analyze the relation between safety leadership (through three specific elements of safety leadership including participative management, safety concern, and safety incentive) and safety behavior (safety participation behavior and safety compliance behavior).

Vinodkumar and Bhasi [7] and Chen and Chen [8] found the positive effects of safety motivation on safety behavior, when employees are well motivated, they tend to adhere to safety requirements. However, garment and footwear are a high-insensitive work industry with high work pressure. This is the factor impacting the effectiveness of safety programs. Because work pressure has the potential to affect productivity and reduce safety, which leads to increased accident rates [9, 10]. In a recent study, Fernández-Muñiz et al. [4] demonstrated that work pressure negatively impacts compliance behavior, but has not yet clearly identified the impact of work pressure on safety participation behavior. In addition, there is rare research on the moderator ability of work pressure on the relationship between safety motivation and safety behavior. Thus, this study explores the moderating role of work pressure on the relationship between safety motivation and safety behavior.

Furthermore, to prevent Covid-19 from spreading, the Vietnam government and the enterprises provide training and communication to increase worker's awareness of Covid-19 [11, 12] and establish additional requirements such as keeping a safe distance of two meters, medical declaration, wearing masks and limiting group gatherings. The effectiveness of these programs is largely depending on workers' risk perception of Covid-19. However, few studies look at the relationship between workers' risk perceptions of Covid-19 and the safety behavior of workers. Therefore, this study investigates the relationship between workers' perceptions of Covid-19 risk and safety behavior.

Thus, in this paper, the author intends to investigate the precedent of safety performance in the garment and footwear industry. Subsequently, it instructs ways for leaders to actively coordinate and interact with employees and recommend policies to encourage safe behaviors to enhance safety performance.

The rest of the study is organized and presented including the following sections. Section 2 presents the theoretical framework, research model, and hypotheses. Section 3 elaborates on the data collection and research methods. Section 4 reports the results, and section 5 discusses the research findings. Section 6 shares conclusions including the implication, limitations of the study & suggestions for further research.

2. THEORETICAL AND RESEARCH HYPOTHESIS

2.1 Social exchange theory

Social behavior is the result of a process of social exchange that aims to achieve more benefits while minimizing costs. Therefore, the potential cost and benefits of social relationships are often weighed against each other [13]. If a person believes that they will gain more benefits than the cost of performing the behavior, that person will intend to involve in the behavior. Blau [13] emphasized that when people receive benefits, there is an implicit obligation within them that they need to create beneficial values in the future engagement for the other party (individuals/organizations). Thus, when workers feel the organization's commitment to their safety, through participative management or safety concern. From within, Employees will be inspired to support the organization's safety initiatives by following safety procedures and participating in safety programs. In recent studies, many authors use the social exchange theory to explain the relationship between safety leadership and safety behavior [4], between safety leadership, safety climate, and safety behavior [5], between safety leadership, safety motivation, and employee safety behavior [14].

2.2 Safety behavior

Safety behavior is an important component contributing to the safe operation of enterprises [5, 15]. As reported by Zohar [16], safety behavior is all behaviors that benefit the safety of employees, the safety of people around them, or the safety of machinery, equipment, and business property. Griffin and Neal [17] classified occupational safety behavior into two factors: safety participation behavior and safety compliance behavior. Safety compliance behaviors are key activities that workers need to complete to ensure workplace safety. It includes strictly following safe operating procedures, following safety instructions such as using PPE (personal protective equipment), and performing safety checks on equipment and machinery in their daily work [17]. Safety participation behaviors refer to behaviors that do not directly improve occupational safety conditions, but that help creates a positive safety environment. Participation behavior includes the active involvement of workers in safety activities and safety meetings, proactively detecting potential hazards, and reporting unsafe conditions for timely remediation [17].

2.3 Safety leadership

Safety leadership is the process by which leaders, through interacting with their employees in the organization's environment, influence and positively impact employees in order to meet the organization's safety objectives [18]. Cohen [19] concluded that the commitment of managers toward safety is an extremely important factor in determining the success of safety programs. That commitment is demonstrated through actions, such as visiting the workplace for safety checks and discussing safety issues with employees. Subsequent studies have contributed to emphasizing how important leadership is in improving the safety behavior of workers [4, 5, 20]. Safety leadership is often classified into two types: transactional leadership and transformational leadership [21].

Transactional leadership is a leadership style that applies performance-based reward and punishment mechanisms to motivate employees to perform work safely [21]. The leader can monitor and achieve the organization’s goal by establishing clear goals and defining the rewards with contractual obligations [22]. Zhu et al. [23] recommended that organizations should link employees’ job performance to the reward system and should provide appropriate resources to effectively carry out their job. Since incentives are widely accepted as the key feature to promoting employee safety [24], this study focuses on safety incentive as a representation of transactional leadership to explore how safety incentive associate with employees’ safety behavior.

On the contrary, the study [25] explained transformational leadership as a way to motivate their followers to raise performance by changing their attitudes, beliefs, and values rather than simply conforming. Transformational leadership requires leaders to be goal-oriented, motivated and determined to participate in safety activities and to be concerned about employee safety [26]. So that they can build trust and respect among their adherents, who are inspired to accomplish more than initial expectations [25]. In this study, the author focuses on safety concern and participative management as transformational leadership dimensions that could impact organization safety performance [27, 28].

2.4 Research hypotheses

2.4.1 Participative management, safety concern, and safety incentive

As mentioned above, participative management and safety concern are two components of transformational leadership. Safety-related leadership behaviors are explained in the term participative management [27]. Participative management refers to managers' in-person participation in safety activities, such as regular communication with workers, participation in safety audits or regularly visiting the workplace to check the safety conditions [4]. Previous studies [7, 8] show that employee perceptions about management commitment to safety and their perceived safety management practices relate to employees’ safety behavior through safety motivation.

On the other hand, the safety concern is referred to the manager's emphasis on safety-related issues, such as stressing the importance of using PPE, showing care, and monitoring improvements in safety issues [5]. Other studies [29, 30] have revealed that workplace safety will receive a greater contribution from its employees when their leader shows them sincere concern and they can feel good support from leaders.

Safety concern are also indicated as one of the safety leadership dimensions that influence organizational performance [28].

According to the social exchange theory of Blau [13], when employees perceive the care and support from leaders, then they will feel an obligation to create future benefits for the organization [31]. Hofmann and Morgeson [32] informs that employees will tend to adopt safe behaviors when they feel their organization is supportive and satisfied with a good relationship with their managers [33]. In a recent study, Xue et al. [5] showed that safety concern and safety vision are the most important factors determining the safety behavior of workers, while according to Vinodkumar and Bhasi [7], leadership commitment, including safety engagement activities, positively impacts safety compliance behavior. From the above explanations, the author proposes the following hypotheses:

H_{1a}: Participative management positively impacts workers' safety compliance behavior.

H_{1b}: Participative management positively impacts workers' safety participation behavior.

H_{1c}: Participative management positively impacts workers' safety motivation.

H_{2a}: Safety concern positively impacts workers' safety compliance behavior.

H_{2b}: Safety concern positively impacts workers' safety participation behavior.

H_{2c}: Safety concern positively impacts workers' safety motivation.

Safety incentive is a leadership approach of using a reward and punishment policy to encourage safe behaviors and discipline unsafe behaviors [5]. A properly designed safety incentive policy will help strengthen workers' awareness of job risks and encourage reporting of safety problems, thereby reducing unsafe behaviors and motivating employees to engage in safety activities [34, 35]. Meanwhile, other studies have argued that safety incentive programs for zero-injury campaigns over a certain period may discourage workers from reporting work-related accidents [30, 36]. Therefore, safety incentive programs should focus on the expected behaviors to achieve the outcome such as attending safety training and reporting safety issues to prevent safety accidents rather than focusing on outcomes such as the number of accidents [37].

Even though some authors consider the transformational leadership style is more effective than the transactional leadership style [22, 38], it's likely to be ineffective without the transactional relationship between leaders and subordinators [39]. Bass and Bernard [25] suggest combining both leadership styles to achieve expected outcomes. Inness et al. [40] recommends that using rewards and punishments as a formal control may be more effective to gain safety compliance than applying transformational leadership. However, Fernández-Muñiz et al. [4] have not found a link between safety incentive and safety compliance behavior, while Xue et al. [5] have failed to demonstrate an association between safety incentive and safety participation behavior. In addition, Clarke and Ward [41] showed that when an organization has a safety rewards and feedback program, it will encourage the safety behavior of employees. Therefore, the author proposes the following hypotheses:

H_{3a}: Safety incentive positively impacts workers' safety compliance behavior.

H_{3b}: Safety incentive positively impacts workers' safety participation behavior.

H_{3c}: Safety incentive positively impacts workers' safety motivation.

2.4.2 Risk perception of Covid-19

The Covid-19 pandemic has significantly changed lives from every angle including the workplace such as changing in environment, working patterns, and methods. These uncertainty changes create psychological instability for employees and have a negative impact on employees' attitudes and emotions at the workplace [42]. The social distancing and remote work policies brought on by the pandemic have exacerbated the situation by lessening co-worker support and current resources, which increases employees' perception of uncertainty level [43]. Li and Griffin [44] explored the negative impact of the experience of Covid-19 on job satisfaction and found the contrasting paths of the Covid-19 experience to employees' safety behavior. The gap in the existing literature is insufficient for explanations for how workers' risk perception of Covid-19 is related to safety motivation and safety performance.

Perception of risk is an individual's level of subjective risk assessment, based on the individual's belief in the likelihood of hazards, and may differ from the actual level of risk [45]. Therefore, even when exposed to the same source of threat, individuals have different levels of response [46]. The protection motivation theory of Rogers [47] suggest that when people perceive health threat, they are motivated to adjust their behavior in a self-protective way. Because the Covid-19 pandemic has a high rate of human-to-human transmission and receives the high attention of the public. So Covid-19 risks are well communicated through the different media channels in order to raise the public's knowledge, awareness, and attitude about the emergency of Covid-19 [11, 12]. Together with the Covid-19 awareness enhancement efforts from the enterprises, these works are shaping workers' perception of the risks of Covid-19 and influent their attitudes & behaviors [48].

When individual perceives the level of risk of Covid-19 as low, they tend to not adhere to infection prevention measures and vice versa [49]. So, the level of perception of risk from Covid-19 is related to the willingness to make an effort to comply with safety requirements or to participate in safety activities. From the above discussions, the author proposes the following hypotheses:

H_{4a}: Risk perception of Covid-19 positively impacts workers' safety compliance behavior.

H_{4b}: Risk perception of Covid-19 positively impacts workers' safety participation behavior.

H_{4c}: Risk perception of Covid-19 positively impacts workers' safety motivation.

2.4.3 Safety motivation

As safety behavior studies are rare in the garment and footwear industry, safety research in other areas has addressed the driving force of safety behavior [5, 8, 50]. Recent studies have explored the personally related antecedents of safety behavior, including personality, knowledge, and skill [44, 51]. In contrast, other authors have examined the organizational factors such as job design, training, safety policy, safety rules, and procedure that impact safety behavior [5, 52]. Align with the personally related antecedents, this research proposed that safety motivation associate with safety behavior in conformity with the safety performance framework [17].

Safety motivation is explained as the willingness of workers to exert effort to perform safe behaviors [7, 8]. Bakker et al.

[53] clarified work engagement as a positive motivation state of dedication, enthusiasm, and absorption in the work while. Neal and Griffin [54] defined safety motivation as a safety-specific motivation concerning work. It is also recognized as a factor related to workers' perceptions and attitudes that promote safe or unsafe behavior [55]. According to a recent study, safety motivation was found as a mediator of the effects of risk perception on safety behavior [56]. Furthermore, Chen and Chen [8] revealed that if employees are stronger motivated to be safe, they are much more inclined to display positive safety behavior. Therefore, the author proposes the following hypotheses:

H_{5a}: Safety motivation positively impacts workers' safety compliance behavior.

H_{5b}: Safety motivation positively impacts workers' safety participation behavior.

2.4.4 Work pressure

Morrow et al. [57] describes work-safety tension, namely work pressures and safety rules, as a dimension of safety climate. Work-safety tension is employees' perception of the degree of risk and the inherent conflict between the organization's productive targets and their safety while performing their job. Work-safety tension was identified as the most significant influence on safety behavior, the employee is unlikely to perform work safely if the organization values productivity more than safety as employees are motivated to prioritize productivity and bonus [57]. The work-safety tension is in charge of a major rate of variance in different unsafe behavior such as traffic violations, distraction, and error during driving [58]. Dedobbeleer and Béland [59] emphasize the role of work-safety tension in the safety research related to the process industry and construction fields. Fernández-Muñiz et al. [4] defines work pressure as part of job demand which is categorized as a component of working conditions [60].

Work pressure is the perceived level of employees toward the overload of workload and time pressure to complete the work [10]. Work pressure can cause employees to experience an increase in psychological stress, which is a factor that leads to unsafe behaviors of workers and causes occupational accidents [61]. Since garment and footwear is a manufacturing industry that has high time pressure and high-intensity work, employees may feel a sense of conflict in prioritization between production goals and occupational health & safety [41], it is also a factor that limits positive safety behavior such as non-compliance with safety procedures [4] or restricts employee participation in safety programs. So even though an organization is committed to and motivates workers to be safe, the work pressure can affect the willingness to participate in safety activities, as well as to be compliant with safety procedures. Therefore, the author believes that work pressure has a moderate role in the relationship between safety motivation and safety behavior, and proposes the following hypotheses:

H_{6a}: When the work pressure is lower, the safety motivation has a greater impact on the safety compliance behavior of employees and vice versa.

H_{6b}: When the work pressure is lower, the safety motivation has a greater impact on the safety participation behavior of employees and vice versa.

A summary of the research hypotheses is shown in Figure 1.

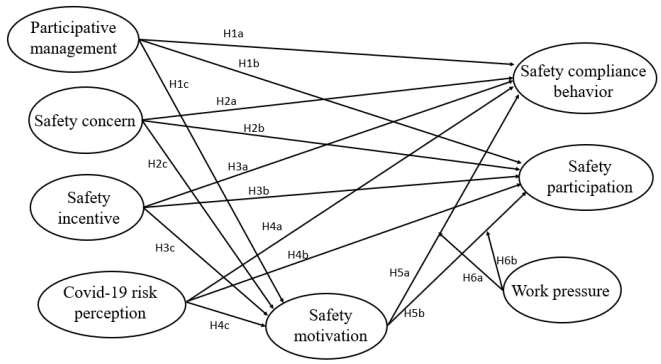

Figure 1. Research model

3. RESEARCH METHOD

The multi-method approach proposed by McMillan and Hwang [62] was used to test the research hypothesis, including: literature review, in-depth interview, cross-sectional survey, and quantitative research to test research hypothesis. First, to build the measurement scales suitable to the context of the footwear and garment industry in Vietnam, the author used in-depth interview in the qualitative research to adjust the scale. Next, to examine the relationships in the research model, a cross-sectional survey technique is performed, and the partial least squares structural equations modeling (PLS-SEM) is used to test the research hypotheses.

3.1 Qualitative research

In-depth interviews were administered to 12 participants (6 men and 6 women), the participants are senior safety professionals and safety managers who work in Garment and Footwear enterprises. The discussed questions focused on the links between safety leadership and workers' safety behavior. Open-ended questions were used such as: "When managers care about safety in the factory and regularly check safety at the workshops, it will create motivation for workers and has a positive impact on the safety participation behavior as well as the safety compliance behavior.

The results from qualitative research show that safety leadership factors predict safety behavior which is consistent with the reality of the garment and footwear industry. Among the factors associate with the safety behavior of employees, participative management is gauged as the most obvious impact, followed by the safety incentive factor. In addition, work pressure is assessed as a moderating role in the relationship between safety motivation and safety behavior.

The groups of observed variables are built to represent safety leadership factors, Covid-19 risk perception, safety motivation, and employees' safety behavior. These observed variables and survey questions are evaluated by senior safety professionals, and safety managers before being rolled out for workers to participate in the survey.

3.2 Quantitative research

3.2.1 Data collection

The target population of the research is garment and footwear enterprises, including three garment and five footwear enterprises, which are in seven provinces in Vietnam. These businesses are diverse in size (from 1,800 to 20,800

employees) to ensure as most generalized results as possible.

As suggested by Hair et al. [63], the minimum sample size is the number of questions multiplied multiplied by 5. In this study, the questionnaire includes 35 items, so the minimum sample size is 175. Non-probability sampling method was used to determine the research sample. The survey questionnaire was designed and was then randomly distributed to 1,215 workers to participate in the survey from October to December 2021. Participants were informed in advance that they reserved the option to decline to take the survey and the information collected would remain anonymous. Employees use a smartphone and scan QR Codes to answer questions. As a result, 967 usable answered forms were collected (Table 1).

The partial least squares structural equations modeling (PLS-SEM) was selected for data analysis. Because explanations, predictions, and given the study's expected managerial implications were the core of our proposed model and hypothesized relationships [64, 65]. The author uses the SPSS 24.0 software and SmartPLS 3.3 to measure the model parameters. The analysis includes two steps: measurement model evaluation and structural model evaluation [66].

3.2.2 Measuring scale

The author uses a multivariate scale, each concept is measured using many different questions. This process includes many different stages. First, the author review previous research on safety leadership (e.g. Brown et al. [9]; Barling et al. [26]; Wu et al. [2]; Vinodkumar and Bhasi [7]; Fernández-Muñiz et al. [4]; Xue et al. [5]), on working conditions (e.g. Brown et al. [9]; Barling et al. [26]; Seo [10]; Fernández-Muñiz et al. [4]), Covid-19 risk perceptions (e.g. Chi et al. [67]; Yan et al. [68]) and safety performance (e.g. Griffin and Neal [17]; Chen and Chen [8]; Xue et al. [5]). This phase provides a potential list of questions to gauge the concepts in this study. After drawing up the initial list of question items, the draft questionnaire was refined so that the redundant items are eliminated. Then, these survey questions are reviewed by safety experts before conducting the survey. The final questionnaire contains 19 questions to measure the perception of workers about three elements of safety leadership, 3 questions to assess safety motivation level, 3 questions to evaluate workers' risk perception of Covid-19, and 6 questions to assess self-rated safety behavior. All questions were stated in a neutral to prevent a biased manner and were rated using a five-point Likert scale from 1 to 5 (1 = strongly disagree; 5 = strongly agree with the statement) (Table 2).

4. RESEARCH RESULTS

4.1 Description of the research's sample

A total of 967 valid observations were collected at eight enterprises in different regions and the demographic details are presented in Table 1. Female respondents account for 66.7% which is almost double the number of male respondents (33.3%). 60.25% of participants are between the ages of 25-40-year-olds. Most of the employees participating in the survey have been vaccinated with at least one dose (95.3%). These samples were taken randomly at the main processes in the production lines.

Table 1. Respondents' information (n=967)

Information	Percentage (%)
Gender	
Male	33.3
Female	66.7
Age	
18–25-year-old	25.5
25–40-year-old	60.5
Over 40-year-old	14
Seniority	
Less than 1 year	24.7
1-3 years	31.4
More than 3 years	43.9
Vaccination Status	
Partial vaccination (one-shot)	36.8
Full vaccination (two shots)	58.5
Not yet have vaccinated	4.7

4.2 Measuring model

Since the respondents answered all the statements on the same questionnaire at the same time, a common method bias is possible [69]. Therefore, the author performs Harman's single-factor test for this bias. The results show that a fixed factor is associated with the remaining 4 factors. The total extracted variance of these 5 factors is 65.52%, the extracted variance of the first factor accounts for 42.3% (<50%), so the common method Bias is not a big concern [69].

Since all structures in the model latent variables in the structural model are measured using a reflection scale. So, first, internal consistency reliability is evaluated through Cronbach's alpha coefficient, composite reliability [70, 71], and rhoA coefficient [72, 73]. Next, the author measured Convergent validity through the Outer loading of observed variables and average variance extracted (AVE). In order to accept the scale, the AVE value must be bigger than 0.5, and the outer loading value must be bigger than 0.7 [71]. Then, the author performed Bootstrap 5,000 times to evaluate the statistical significance of the data [71].

Table 2 shows that Cronbach's Alpha coefficient of the structures is in the range [0.725 - 0.922], the Composite Reliability value is in the range [0.840 - 0.937] and the rhoA coefficient is in the range [0.798 - 0.925]. The reliability values of Cronbach's alpha, rhoA, and Composite Reliability are all greater than 0.7 as recommended by Hair et al. [71]. So the structures all have very good internal consistency. As far as convergent validity is concerned, the mean extracted variance values are above the cut-off point of 0.5 for all structures, and the observed variables' outer loadings are all higher than 0.7 indicating that all structures have convergent validity [71].

The author evaluated the discriminant validity of the constructs. Cross loadings, Fornell-Larker criteria, and HTMT (Heterotrait-monotrait ratio) were used to gauge the discriminant validity of the structure [71, 74]. The cross-loading analysis results show that the cross-loading coefficient in its structure is much greater than in the other structure. Furthermore, the results are presented in Table 3, the square root of the AVE of each structure (located on the diagonal) is greater than the correlation coefficient between the structures. Furthermore, the HTMT value is less than 0.9 (Table 4) as suggested by Henseler et al. [74].

Table 2. Scale accuracy analyses

Constructs	Items	Outer Loadings	α	C.R	rhoA	AVE
Participative Managemet [2, 26]	PM1. Managers provide appropriate resources to prevent safety-related incidents from occurring	0.735	0.922	0.937	0.925	0.649
	PM2. Managers join workplace inspections and safety audits	0.779				
	PM3. Managers regularly evaluate the effectiveness of safety systems	0.841				
	PM4. Managers join safety training activities and provide safety information to employees	0.844				
	PM5. Managers regularly visit the shop floor to check safety conditions and discuss with workers	0.817				
	PM6. Managers are committed to identifying safety hazards and planning preventive actions	0.831				
	PM7. Managers prioritize safety issues over other issues	0.794				
	PM8. Managers act quickly when notified of a safety incident	0.798				
Safety Concern [5, 28, 73]	SC1. Managers show care about the safety issue	0.817	0.882	0.911	0.886	0.630
	SC2. Managers compliment the safety behavior	0.824				
	SC3. I will receive safety rewards (e.g. bonuses, awards, certificates of honor) When I set a good example of safe behavior.	0.762				
	SC4. Managers show care about whether the safety situation is improved.	0.836				
	SC5. Managers highlight the importance of using personal protective equipment	0.760				
	SC6. Managers can resolve employee disagreements over safety issues	0.761				
Safety Incentive [4, 9, 10]	SI1. Managers recognize employees who care about safety.	0.793	0.871	0.907	0.873	0.662
	SI2. Employees with good safety behavior are easier to be promoted	0.844				
	SI3. The company rewards employees who report hazards in their workplace	0.852				
	SI4. Safe behavior is considered when evaluating performance and determining compensation/or promotions	0.842				
	SI5 The company takes strict disciplinary action for non-compliance with safety rules and procedures	0.730				
Safety Motivation [8, 54]	SM1. It is worthwhile to make an effort to maintain or improve personal safety	0.883	0.874	0.923	0.875	0.799
	SM2. It is important to always maintain the safety	0.903				
	SM3. It is important that the risk of workplace accidents is reduced.	0.896				
Safety Compliance Behavior [5, 54]	SCB1. I strictly follow safety procedures to carry out my work	0.916	0.897	0.936	0.898	0.829
	SCB2. I pay high attention to safety when carrying out my work	0.900				
	SCB3. I use all appropriate safety equipment to carry out my work	0.916				
Safety Participation [5, 54]	SPB1. I promote the safety program in my company	0.904	0.863	0.916	0.866	0.785
	SPB2. I make more efforts to improve the safety of my workplace	0.872				
	SPB3. I volunteer to perform tasks/activities that improve my workplace safety	0.881				
Covid-19 Risk Perception [68]	CRP1. I could be infected with Covid -19 even if I try to avoid it	N/A[a]	0.725	0.840	0.798	0.640
	CRP2. I think my health will be seriously damaged if I got infected with Covid -19	0.852				
	CRP3. Covid -19 is more serious than other respiratory illnesses	0.875				
Work Pressure [4]	WP1. Employees are often pressurised to finish tasks quickly	0.828	0.893	0.892	0.869	0.675
	WP2. Work overload sometimes makes it necessary to ignore safety rules	0.883				
	WP3. Safety rules and instructions make it more difficult to achieve production objective	0.871				
	WP4. Employees sometimes receive requests simultaneously that are maturely incompatible	0.832				

Note: α: Cronbach's alpha; C.R: Composite reliability; AVE: Average variance extracted
[a]*Items removed due to low loading*

Table 3. Fornell-Larcker criterion

Constructs	1	2	3	4	5	6	7
1. Covid-19 Risk Perception	**0.800**						
2. Participative Management	0.480	**0.806**					
3. Safety Compliance Behavior	0.572	0.593	**0.911**				
4. Safety Concern	0.470	0.798	0.617	**0.794**			
5. Safety Incentive	0.386	0.648	0.553	0.776	**0.814**		
6. Safety Motivation	0.547	0.632	0.671	0.638	0.585	**0.894**	
7. Safety Participation Behavior	0.544	0.662	0.798	0.637	0.543	0.696	**0.886**

Table 4. Heterotrait-Monotrait Ratio (HTMT)

Constructs	1	2	3	4	5	6	7
1. Covid-19 Risk Perception							
2. Participative Management	0.558						
3. Safety Compliance Behavior	0.676	0.649					
4. Safety Concern	0.561	0.874	0.691				
5. Safety Incentive	0.473	0.715	0.622	0.885			
6. Safety Motivation	0.652	0.701	0.756	0.723	0.668		
7. Safety Participation Behavior	0.653	0.740	0.807	0.724	0.621	0.799	

Table 5. Hypotheses testing results

Examined Relationships	Coefficient	t-value	p-value	Hypothesis
H_{1a}: Participative Management → Safety Compliance Behavior	0.085	1.829	.067*	Support
H_{1b}: Participative Management → Safety Participation Behavior	0.250	4.638	.000***	Support
H_{1c}: Participative Management → Safety Motivation	0.233	4.307	.000***	Support
H_{2a}: Safety Concern → Safety Compliance Behavior	0.145	2.263	.024**	Support
H_{2b}: Safety Concern → Safety Participation Behavior	0.111	1.767	.077*	Support
H_{2c}: Safety Concern → Safety Motivation	0.159	2.543	.001***	Support
H_{3a}: Safety Incentive → Safety Compliance Behavior	0.100	2.56	.011**	Support
H_{3b}: Safety Incentive → Safety Participation Behavior	0.019	0.497	.710	Reject
H_{3c}: Safety Incentive → Safety Motivation	0.200	4.435	.000***	Support
H_{4a}: Covid-19 Risk Perception → Safety Compliance Behavior	0.251	6.247	.000***	Support
H_{4b}: Covid-19 Risk Perception → Safety Participation Behavior	0.172	4.56	.000***	Support
H_{4c}: Covid-19 Risk Perception → Safety Motivation	0.293	6.872	.000***	Support
H_{5a}: Safety Motivation → Safety Compliance Behavior	0.326	5.678	.000***	Support
H_{5b}: Safety Motivation → Safety Participation Behavior	0.360	7.431	.000***	Support
R^2 Safety Motivation = 0.529		Q^2 Safety Motivation = 0.414		
R^2 Safety Compliance Behavior = 0.560		Q^2 Safety Compliance Behavior = 0.455		
R^2 Safety Participation Behavior = 0.593		Q^2 Safety Participation Behavior = 0.456		

*Significant at 0.1 level, **Significant at 0.05 level, ***Significant at 0.01 level

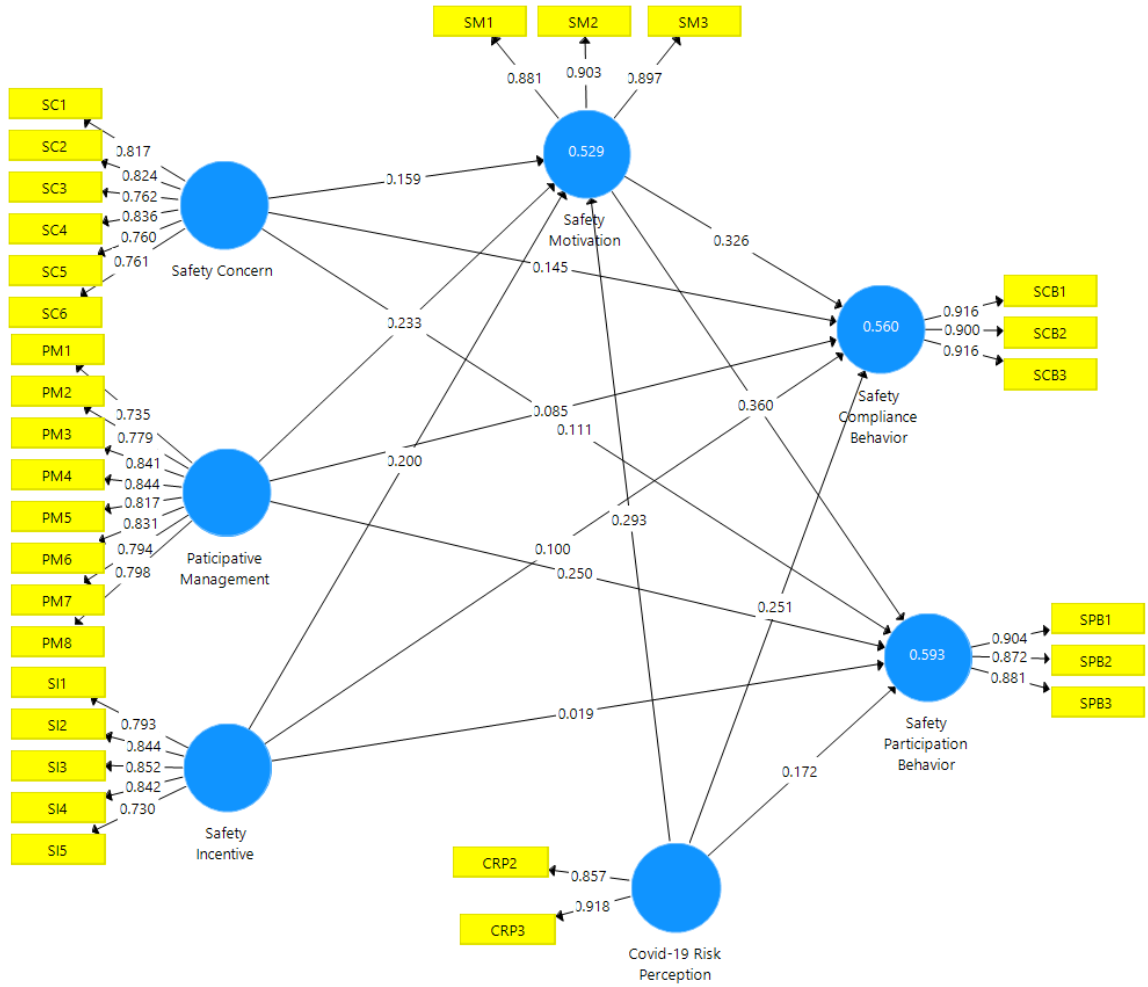

Figure 2. PLS-SEM analysis results of the theoretical model

Table 6. Tests for moderating effects

	Coefficient	t-value	p-value	Supported hypothesis
Safety Motivation → Safety Compliance Behavior	0.625	19.343	0.000	
Work Pressure → Safety Compliance Behavior	-0.178	-5.862	0.000	Support H_{6a}
Safety Motivation x Work Pressure → Safety Compliance Behavior	-0.121	-2.786	0.006	
Safety Motivation → Safety Participation Behavior	0.646	22.257	0.000	
Work Pressure → Safety Participation Behavior	0.171	6.104	0.000	Reject H_{6b}
Safety Motivation x Work Pressure → Safety Participation Behavior	-0.011	0.294	0.768	

The results of performing Bootstrap 5,000 times show that the confidence interval for the HTMT value is from 2.5% to 97.5% excluding the value 1, so all 6 constructs are conceptually discriminant.

4.3 Structural model

4.3.1 Direct effects

Before evaluating the structural model, the problem of multicollinearity is tested for each set of independent variables, the variance inflation factors (VIF) will be used in this case. Because the model has many dependent variables, the main model has been divided into 3 models with 1 dependent variable in each model. As a result, no significant multicollinearity was found, and all variance inflation factors (VIF) were significantly below threshold 3, as suggested by Hair et al. [71].

To test the direct relationship in the model, the author used the bootstrapping procedure in PLS-SEM with 5000 subsamples as suggested by Hair et al. [71]. The results are summarized in Table 5 and Figure 2, out of 14 proposed hypotheses, 2 hypotheses H1a and H2b are supported with over 90% confidence, and 2 hypotheses H2a and H3a are supported with 95% confidence level, 9 hypotheses are supported with 99% confidence level.

The coefficient of determination R2 was used to evaluate the predictive strength of the independent variables as suggested by Hair et al. [71]. The predictive level of the 3 variables safety motivation, Safety compliance behavior, and safety participation behavior is considered average (R2 Safety motivation = 0.529; R2 safety compliance behavior = 0.560, and R2 safety participation behavior = 0.593) according to the results shown above. Table 5 and Figure 2.

In addition, out-of-sample predictive power is assessed through predictive relevance (Q2) [71]. The results also show that dependent variables have a coefficient Q2 greater than 0 (Table 5), so the external predictive power of the model is also supported.

4.3.2 Moderator role

Exploring the moderator role of work pressure is the important objective of this study, the scale accuracy analysis for work pressure is showed in Table 2. First, the moderator - "work pressure" is added to the main model to evaluate the measurement model. Cronbach's alpha coefficient = 0.893 and Composite Reliability = 0.892, so the work pressure scale is reliable. AVE = 0.675, the Correlation coefficient between the structures is less than the square root of AVE, and the confidence interval of the HTMT value of work pressure does not contain 1, HTMT < 0.9, outer loadings > 0.7 (Table 2).

Next, the two-stage approach of Chin et al. [75] was used to evaluate the effect of the moderator - "work pressure". Stage 1, estimate the main impact model. In the second stage, multiply the exogenous and regulatory variables to measure the interaction term.

Table 6 shows that work pressure positively impacts safety compliance behavior and safety participation behavior. Moreover, the moderator role of work pressure in the relationship between (1) safety motivation and safety compliance behavior (H6a) is statistically significant. However, the relationship between safety motivation and safety participation behavior is not moderated by work pressure (H6b).

5. DISCUSSION

5.1 Participative management, safety concern, safety incentive

The social exchange theory Blau [13] sheds light on how safety leadership associate with worker's safety behavior. And the workers' behavior is the result of safety-related exchange process between leadership and worker. In align with social exchange theory, our findings indicate that safety leadership has the association with safety motivation and worker's safety behaviors. Some key results are discussed in detail below.

The result illustrates that safety compliance is conditioned by participative management, safety concern, and safety incentive. Which is similar to those reported by Vinodkumar and Bhasi [7] and Xue et al. [5]. In contrast to Fernández-Muñiz et al. [4] and Xue et al. [5], this study show that Safety participation is associated with participative management and safety concern. While safety participation is not predicted by safety incentive. Because the garment and footwear enterprise focus more on compliance key performance indicators (KPIs) such as the number of violation cases of not wearing PPE, and therefore the impact of safety incentive policy to worker safety participation behavior is limited.

Consistent with the social exchange theory Blau [13], this work reveals that all three elements of safety leadership have relation with safety motivation. Furthermore, safety motivation associate with safety behavior which is aligned with the findings from Chen and Chen [8] and Xue et al. [5].

5.2 Risk perception of Covid-19

As explained by the protection motivation theory of Rogers [47], people are motivated to perform action in the way to protect themselves from a perceived health thread. Therefore, during Covid-19 breaks out, the risk perception of Covid-19 associates with workers' motivation and safety behavior. The result also aligns with those reported by Pandit et al. [76] who states that the underestimation of safety risk is often associated with unsafe behavior and non-adherence to safety requirements.

5.3 Work pressure and moderator role

In contrast to safety compliance, the moderator role of work

pressure on the relationship between safety motivation and safety participation behavior is not satisfied. Because safety compliance is defined as contractual requirement behavior, while safety participation behavior refers to the proactively involvement of the worker in safety activity [17]. So, the organizations are easier to gain safety compliance than safety participation. Furthermore, in the garment and footwear industry, safety participation is not well encouraged, and compliance behavior is being used as the main KPIs to measure employee performance. This result suggests that, even though the leadership has appropriate safety programs to promote and motivate employees to work safely. If the work pressure is higher, the level of safety compliance of the employees will still be lower. This result compliment to the study of Amponsah-Tawaih and Adu [77] which explains the moderator role of management commitment to the relationship between work pressure and employees' safety behavior.

6. CONCLUSION

The objectives of the study were achieved by providing empirical data to demonstrate the positive relation between safety leadership factors (safety concern, participative management, safety incentive) and the safety motivation, safety behavior of workers in the garment and footwear industry in Vietnam. Furthermore, the relationship between risk perception of Covid-19 and safety motivation, and safety behavior are well defined. Finally, the study has demonstrated the moderator ability of work pressure to the relation between safety motivation and safety compliance behavior of employees.

6.1 Theory contribution

This research broadens the theoretical perspective on how Covid-19 risk is perceived and its association on safety behavior, as very few studies examine the link between risk perception of Covid-19 and safety behavior. Moreover, the new findings regarding the impact of workers' risk perception of Covid-19 on safety motivation also serve as a pioneer for further research in the field of health & safety and scientific fields.

In addition, the study enlarges the knowledge of the determinants of safety behavior. This work reveals the moderator role of work pressure in the relation between safety motivation and safety compliance behavior. Furthermore, it has a very important contribution as it was conducted on samples that have not been studied before, the research population is a worker in the garment and footwear enterprises in Vietnam – A developing country.

6.2 Practical implication

This research offers guidelines about the behaviors that leaders should adopt to improve safety performance in their enterprises. The results indicate that transformation leadership factors have the highest impact on employee safety behavior. Specifically, safety concern is the greatest factor that predicts employees' safety compliance behavior, while participative management had the most significant impact on safety participation behavior. The leader should use the above results to establish intervention strategies to demonstrate leadership commitment and to have more direct engagement with workers, along with the establishment of performance evaluation criteria to measure the effectiveness of these safety programs.

The analytical model's results revealed that safety incentive does not associate with employees' safety participation behavior, which urges managers to reconsider the current criteria for safety performance evaluation. Leaders could adjust and supplement safety leading KPIs such as the number of hours participating in safety training, the number of safety reports (near miss or unsafe behavior, unsafe condition), or the number of safety kaizen. It is also critical to increase the proportion of safety leading KPIs relative to the total safety performance metrics.

As the moderator role of work pressure on the link between safety motivation and safety compliance behavior has been defined. It's critical to assure proper working conditions are maintained and work pressure is well-controlled. The organization should consider multiple approaches such as enhancing worker competence, providing a good working environment, and establishing appropriate production targets.

6.3 Limitations and recommendations

The study shows an association between safety incentive and safety compliance behavior. However, it has not yet explored the individual effects of safety rewards and sanction policies for non-compliance behavior. Future research should find out whether rewarding or sanction policies have a greater impact on safety compliance behavior. The author analyzes the relationship between safety leadership and safety behavior, and the relationship between epidemic risk perception and safety behavior. Future study should examine the relationship between safety leadership, epidemic risk perception, and safety behavior. In addition, further study may interest to investigate the mediating role of safety motivation on the relationship between safety leadership, Covid-19 risk perception and worker safety behavior.

Although the moderator role of work pressure on the relationship between safety motivation and safety compliance behavior was identified. This moderator effect was not confirmed for safety participation behavior yet. Therefore, the following studies should continue to test the above hypotheses. Moreover, other works should also examine whether Covid-19 risk perception moderate the association between safety leadership and worker's behavior.

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