

# Responding to a major global crisis: the effects of hotel safety leadership on employee safety behavior during COVID-19

Employee  
safety  
behavior

3365

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## Abstract

**Purpose** – The purpose of this paper is to examine the effect of hotel safety leadership on employee safety behavior during the COVID-19 pandemic, and the mediation role of belief restoration and the moderation role of perceived risk between safety leadership and behavior were also investigated.

**Design/methodology/approach** – The COVID-19 outbreak served as the background for a questionnaire survey of 23 hotels in China with 1,594 valid responses being received. The statistical analysis techniques used were exploratory and confirmatory factor analysis, correlation analysis, structural equation modeling and hierarchical regression.

**Findings** – The results showed that: hotel safety leadership positively affected employee safety behavior (compliance, participation and adaptation); belief restoration partially mediated the influence of safety leadership on safety behavior; and perceived risk negatively moderated the direct effect and the mediation effect of “safety leadership – belief restoration – safety behavior.”

**Research limitations/implications** – The main limitation was that the questionnaires were collected with the same measurement system within a certain period of time (cross-sectional design). Then, future research should test and expand this conceptual model in different crises, business fields, theoretical orientation and cultural backgrounds.

**Practical implications** – Hotels should develop management strategies based on safety leadership and motivate and promote employee safety behavior from the four aspects of safety coaching, care, motivation and control.

**Originality/value** – This investigation expanded the research on the effectiveness of safety leadership and especially with respect to safety in the hospitality industry during a major global crisis. Also, the research conceptual model and variables contained therein are original contributions to the hospitality research literature.

**Keywords** Perceived risk, Self-determination theory, COVID-19 pandemic, Belief restoration, Safety leadership, Substitutes for leadership model

**Paper type** Research paper



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## Introduction

The COVID-19 outbreak is considered to be an impactful incident and a major health crisis in world history (Fong *et al.*, 2020; Zenker and Kock, 2020). In December 2019, several cases of COVID-19 pneumonia were diagnosed in Wuhan, China, and then COVID-19 occurred in more than 200 countries and regions around the world. As of July 18, 2020, the cumulative number of confirmed cases exceeded 85,000 in China and more than 14,000,000 globally (World Health Organization, 2020). Hotels are public places that attract many people and service is accomplished through interactions between employees and guests. Because COVID-19 can be spread through respiratory droplets, physical contact and aerosols, most hotels were fully or partially closed during the pandemic. Moreover, some hotels had clusters of COVID-19 outbreaks and cases. Therefore, the COVID-19 pandemic has greatly affected the sustainability of the hotel industry at the macro level and normal operations at the micro level (Zenker and Kock, 2020; Baum and Hai, 2020; Jiang and Wen, 2020). The crisis required hotels to adopt and maintain high-level safety leadership strategies and safety operational standards. Whether at an acute stage of intra-pandemic or resolution stage of post-pandemic, it is of great importance to promote hotel safety leadership and employee safety behavior to provide safe and satisfying service quality, as well as ensuring the health of guests and employees and hotel safety performance.

Hospitality is a comprehensive service industry and employee safety behaviors have a fundamental impact on workplace safety, product service quality and corporate safety performance (Neal *et al.*, 2000). However, behaviors such as service sabotage, rule-breaking, deviance, counterproductivity, bullying and violence are common in hotel workplaces (Ghosh and Shum, 2019; Harris and Ogbonna, 2002; Lugosi, 2019). Hotel employee safety behavior particularly during crisis events (e.g. COVID-19) is a basic prerequisite for customers to feel safe and enjoy service experiences without fear, as well as for workplace safety. Thus, it is critical to investigate and manage employee safety behaviors in hospitality and other service sectors especially when threats to human lives and economic survival are at the highest levels. The influences on employee safety behavior have attracted considerable attention, which is not only extensively investigated on high-risk industries such as coal mining, construction and firefighting (Newaz *et al.*, 2019; Smith *et al.*, 2019; Wang *et al.*, 2019) but also is gradually receiving greater concern in service industries such as medical care, airlines and hotel food and beverage departments (Avci and Yayli, 2014; Chen and Chen, 2014; Ji *et al.*, 2019; Neal *et al.*, 2000). Leadership is an important organizational resource, which can be influential in promoting employee leadership-oriented behavior, such as green transformational leadership and employee green creativity, shared leadership and employee knowledge sharing, safety leadership and safety behavior (Coun *et al.*, 2019; Li *et al.*, 2020; Lu and Yang, 2010). Hotel leaders during crisis events have the goal of ensuring service safety and normal business operations, as well as mitigating the negative impacts of market downturns so as to assure sustainability (Israeli *et al.*, 2011). Safety leadership (SL) is a safety-goal oriented leadership style in service management, which is the ability to achieve the optimum safety benefits by effectively arranging organizational resources, as well as having a significant positive effect on employee safety behavior and workplace safety (Clarke, 2013; Wu, 2008), particularly during crises where the safety of corporations, employees and customers is under major threat.

However, within this field of research, three key gaps exist. First, there is an absence of empirical research on how to promote hotel employee safety behavior in major crisis situations. An increasing array of crisis events are posing unique and difficult challenges for all corporations and, as with COVID-19, appear to be having disastrous negative impacts on service industries such as hotels. Employee safety behavior is a basic factor underlying

safety performance (Neal *et al.*, 2000) and it becomes even more crucial for hotels to promote employee safety behavior and safety performance during major crises. However, the relevant research about hotel employee safety behavior under abnormal circumstances is still limited. Second, the underlying psychological influences of safety leadership on safety behavior lack empirical investigation. Although safety leadership is considered to be effective for enhancing employee safety behavior (Lu and Yang, 2010), few researchers have explored the psychological mediation of safety leadership affecting safety behavior from an intrinsic motivation perspective. According to the theory of planned behavior, people's beliefs are the psychological basis that drives specific behaviors (Ajzen, 1991). Belief restoration (BR) reflects individuals' intrinsic motivations and self-efficacy for organizational efforts and restoring the safety and stability of workplaces, which is a critical psychological premise driving employee behavior during the COVID-19 pandemic (Fong *et al.*, 2020; Johnston and Johnson, 1989). BR via the influence of safety leadership on safety behavior has not been investigated and is an important research gap needing to be filled. Third, the moderation role of perceived risk in the influence of safety leadership has not been explored. Crisis events force people to make judgments and risk evaluations under pressure, and then serve as the foundation for behavioral decisions (Liu-Lastres *et al.*, 2019; Xie *et al.*, 2020). Safety behavior decisions during crises and high-risk situations involve perceptions and evaluations of the risk environment (Huang *et al.*, 2020). Thus, employee perceived risk during crises is a significant factor and a critical boundary condition that determines the effectiveness of safety leadership. However, the moderation role of perceived risk in these relationships lacks clear and systematic investigation.

Therefore, the COVID-19 pandemic serves as the background for this research. The research purposes were to:

- explore the effect of hotel safety leadership on employee safety behavior during the COVID-19 pandemic;
- explore the mediation role of belief restoration between hotel safety leadership and employee safety behavior; and
- investigate the moderation role of perceived risk in the “safety leadership – belief restoration – safety behavior” relationship.

This research determined the formation of employee safety behavior during a crisis, which provides new insights for hotels in establishing safety leadership strategies, as well as helping to guide hotel crisis management during health crises such as COVID-19.

### Literature review and theoretical basis

Self-determination theory (SDT) proposes that motivations, autonomous and controlled, are the determinants of behavior (Deci and Ryan, 1985a, 1985b), which represent people's self-determined and non-self-determined behaviors, respectively. Autonomous motivation is taking action due to the challenge, meaningfulness or attraction of the behavior itself. In contrast, controlled motivation refers to acting to get or avoid external results. In general, autonomous motivation is described as goal-oriented and value-loaded, belonging to the relationship-oriented motivation element. Controlled motivation is acting due to rewards or punishments, associated with task-oriented motivation (Gagné and Deci, 2005). SDT proposes that behavior is based on a full understanding of self-intrinsic motivation and external environmental information. Environmental and contextual factors have a critical position in the formation of people's motivation and behavior.

To date, SDT has been widely used to investigate the self-determination and psychological mediation processes of organizational leadership strategies that affect employee work behaviors, such as transformational and shared leadership and employee knowledge sharing (Coun *et al.*, 2019); developmental leadership and employee organizational citizenship behavior (OCB) (Zhang and Chen, 2013); and green transformational leadership and employee green creativity (Li *et al.*, 2020). This theory has received some attention in the fields of safety and crises, and the self-determination process of people's safety-oriented behaviors has been examined. For example, based on SDT, and with the background of the Ya'an earthquake, Wang (2014) developed a theoretical model to examine the mechanisms through which different types of motivation (autonomous and controlled) contributed to various crisis participation behaviors in social network services; and Chan *et al.* (2014) examined the antecedents of safety-oriented behavior for reducing myopia risk based on SDT. Moreover, SDT has been applied in the hospitality and service industries, demonstrating strong predictive effectiveness and power in the relationships among hotel leadership, employee motivation and behavior (Kim *et al.*, 2019; Ma *et al.*, 2018). Therefore, this research used SDT as its theoretical basis.

## Hypothesis development

### *Safety leadership*

Leadership represents the interactions between leaders and followers through which leaders exert influence on organizations or followers to achieve goals. Leadership is closely related to safety performance and it has been investigated in safety research (Gracia *et al.*, 2020; Xue *et al.*, 2020). The extant literature mainly reviews the impact of broad leadership styles on corporate safety performance and reveals the impact models of leadership and safety performance based on two leadership styles – transactional and transformational (Barling *et al.*, 2002; Kelloway *et al.*, 2006; Zohar, 2002). Transactional leadership refers to the transaction process between the leader and followers to satisfy each other, with a focus on achieving safety goals through rewards, benefits and control, and it is also called task-oriented leadership (Clarke, 2013; Martínez-Córcoles and Stephanou, 2017; Wu, 2008). Transformational leadership focuses on achieving safety performance through coaching, inspiring visions and caring, and it is also called relationship-oriented leadership (Clarke, 2013; Coun *et al.*, 2019; Wu, 2008). In short, transactional leadership is closely related to rewards and monitoring, which has a greater effect on safety compliance (Clarke, 2013), whereas transformational leadership is directed toward genuinely inspiring employees, which has a greater effect on safety participation (Christian *et al.*, 2009).

Because most leadership styles contain broad ranges of behavioral elements, it is unclear what specific behavior leaders need to perform to promote safety performance among their followers (Griffin and Hu, 2013). Thus, some previous researchers have explored the effect of safety-specific leadership styles (safety leadership) on corporate safety performance (Clarke, 2013; Xue *et al.*, 2020). SL is a sub-set and style of organizational leadership, which represents the process of the interactions between leaders and followers through which leaders exert influence on organizations and followers to achieve corporate safety performance, workplace safety and organizational safety goals (Wu, 2005).

Wu (2008) proposed that safety leadership consisted of three factors, namely, safety coaching, caring and controlling. Lu and Yang (2010) argued that safety leadership included three dimensions, namely, safety motivation, policy and concern. Currently, safety leadership has not received enough attention in the tourism and hospitality field. Based on these findings, four safety leadership dimensions were incorporated, namely, safety coaching, caring, motivation and control. Safety coaching and caring are aspects of

transformational leadership. Safety coaching is when leaders encourage follower safety behaviors through role modeling, decision-making participation, emotional support and opinion sharing. Safety caring refers to leaders respecting and trusting employees, caring about their needs, understanding their problems and providing sufficient safety-related resources. Safety motivation and control are linked with transactional leadership. Safety motivation is when leaders establish motivation and reward systems to encourage employee safety behavior. Safety control refers to leaders ensuring corporate safety performance through setting safety regulations and behavioral norms, monitoring employee safety behavior and using authority to correct deviant behavior (Lu and Yang, 2010; Wu, 2008).

### *Safety behavior*

Safety behavior research originated from Heinrich's (1931) accident causation model, which proposed that unsafe behaviors are the direct cause of accidents. Neal and Griffin (2006) proposed a two-factor model of safety behavior encompassing safety compliance and safety participation (Neal *et al.*, 2000; Griffin and Neal, 2000). Safety compliance involves compliant behavior consistent with institutional norms, position responsibilities and specific task requirements, and safety participation is proactive behavior that contributes to developing an environment that supports safety (Newaz *et al.*, 2019; Smith *et al.*, 2019). However, hospitality companies encounter diverse and complex safety issues due to the risks from multiple external and internal factors (e.g. terrorist attacks, crimes, diseases, colleague rule-breaking and customer behavior) (Kubickova *et al.*, 2019; Liu-Lastres *et al.*, 2019; Lugosi, 2019). Therefore, hotel managers and staff must be increasingly adaptable, versatile and creative in solving threats and issues to ensure safety. Consequently, safety adaptation is a valid addition to the two-factor model of safety behavior, which describes employee actions such as proposing new safety ideas, learning new safety techniques and solving safety issues creatively (Chen and Chen, 2014; Leischnig and Kasper-Brauer, 2015). Therefore, this research proposed that hotel employee safety behavior includes three dimensions – compliance, participation and adaptation.

Organizational leadership is a key influence source for employee safety behavior (Christian *et al.*, 2009; Clarke, 2013). According to social exchange theory, if one provides support, resources and benefits to others, the beneficiaries need to repay to achieve mutual benefit. Supportive actions by leaders for employees may obligate those employees to reciprocate through positive work behaviors (Homans, 1985). SL tends to be supportive through coaching, caring, motivating and controlling, and enhances positive emotional and psychological commitment to leaders. Additionally, it encourages staff to adopt safe practices to maintain workplace safety (Lu and Yang, 2010). Social learning theory proposes that people learn and grow by mirroring the attitudes, thoughts and behaviors of role models (Bandura, 1977). Leaders are role models in organizations, and followers are keen to learn and imitate leader behaviors (Mayer *et al.*, 2009; Wood and Bandura, 1989). Safety leaders attach importance to safety issues at work and improve corporate safety performance through instruction, caring, controlling and supporting (Wu, 2008). Their safety-oriented management strategies and practices inspire employee safety behavior (Lu and Yang, 2010). Thus, it was proposed that:

- H1.* SL has a positive impact on employee safety compliance (*H1a*), participation (*H1b*) and adaptation (*H1c*).

### *Belief restoration*

Self-belief refers to the estimation of one's attitudes, emotions and capabilities of organizing and performing a set of recommended behaviors to manage potential situations (Pedrero and Manzi, 2020; Turner *et al.*, 2006). BR is the staff estimation and judgment that their organizations are capable of organizing and performing the actions required to restore the safety and stability of workplaces during crisis events. During a specific period and in certain contexts, a person's self-belief related to behavioral expectations affects attitudes, subjective norms and perceived behavioral control, as well as further determining behavioral goals related to specific situations (Ajzen, 1991). During a crisis, people with stronger restorative beliefs have greater intent to return to pre-crisis conditions (Liu-Lastres *et al.*, 2019). Moreover, in crisis situations, individuals may follow "role extension" and adopt pro-social and adaptive behaviors (e.g. safety behaviors) to promote their organization's recovery from disasters (Johnston and Johnson, 1989). Thus, employees with strong restorative beliefs are more willing to adopt safety behavior during crises.

When combined with SDT, belief restoration reflects intrinsic motivation when experiencing crisis events. SL serves as an inducer of intrinsic motivation (Deci and Ryan, 1985a; 1985b). Safety coaching and caring serve as relationship-oriented leadership strategies, which involve motivational elements such as embedding values and inspiring vision, thereby resulting in autonomous motivation. Safety motivation and control are task-oriented leadership strategies, involving rewards, punishments and organizational norms, that result in control motivation. Thus, safety leadership strengthens autonomous and controlled motivations related to employee belief restoration. The conservation of resources theory proposes that individuals endeavor to conserve resources they deem valuable from real or potential threats in stressful situations (Hobfoll, 1989). Crisis situations may deplete employees' valuable resources (Guo *et al.*, 2019). As an important intrinsic psychological resource of employees, belief restoration can prevent employees from falling into a spiral of resource loss, as well as ensuring that they have the ability to cope with pressures and generate resource increments (Hobfoll, 1989). Therefore, belief restoration is an important motivational and psychological variable supporting the impact of safety leadership on employee safety behavior. The psychological mediation process of employee belief in organizational leadership and leadership effectiveness has drawn research attention. For example, Kim *et al.* (2019) found that employee environmental beliefs partially mediated the influence of hotel environmental-transformational leadership on employee OCB. Therefore, it was proposed that:

H2. BR mediates the effect of safety leadership on employee safety behavior (compliance, participation and adaptation).

### *Perceived risk*

Risk is defined as the possibility and uncertainty of danger, injury or loss and perceived risk refers to people's subjective evaluation of the probability of personal harm from risk events and the assessment of the magnitude and effects of risk events (Reisinger, 2005; Rimal and Real, 2003). Accordingly, a consensus has developed to evaluate perceived risk from the perspectives of susceptibility and severity (Huang *et al.*, 2020; Liu-Lastres *et al.*, 2019; Witte, 1996). For example, Liu-Lastres *et al.* (2019) measured cruise line customer perceived risk to health-related incidents (Norovirus) in terms of susceptibility and severity. In hospitality, perceived risk reflects employee judgment of internal and external risks and the risk status of the hotel at which they work, as well as subjective assessments of the objective risk environment and risk information (Xie *et al.*, 2020).

Perceived risk is an environmental variable and perceptual factor that is objectively discernable within crises. It plays a critical role in the relationship between organizational leadership, employee beliefs and safety behavior (Oah *et al.*, 2018; Rimal and Real, 2003). The substitutes for leadership concept proposes that individual, task and organizational variables influence and substitute for the effectiveness of leadership (Kerr and Jermier, 1978). Substitute variables serve as enhancers and strengthen the effect of leadership or serve as substitutes and reduce the effect of leadership or serve as neutralizers that eliminate but do not replace the impact of leadership (Ling *et al.*, 2016; Podsakoff and MacKenzie, 1997). The uncertain environments faced by organizations represent an important substitute variable that influences the effectiveness of leadership. In this research, perceived risk was the employees' perception of the risk environment and uncertainty of organizational survival in a crisis situation. This perceived risk serves as a substitute and reduces the effectiveness of safety leadership on safety behavior. In summary, perceived risk negatively moderates the effect of safety leadership on employee safety behavior. Therefore, it was proposed that:

*H3.* Perceived susceptibility (PSU) (*H3a*) and severity (*H3b*) negatively moderate the relationship between safety leadership and safety behavior.

Based on that, this research posits that perceived risk moderates the relationship of “safety leadership – belief restoration – safety behavior,” that is, this mediation effect is moderated by employees' perceived risk. Compared with a low-risk perceptual situation, safety leadership that improves employee belief restoration and safety behavior is much more difficult in high-risk perceptual situations. Thus, it was proposed that:

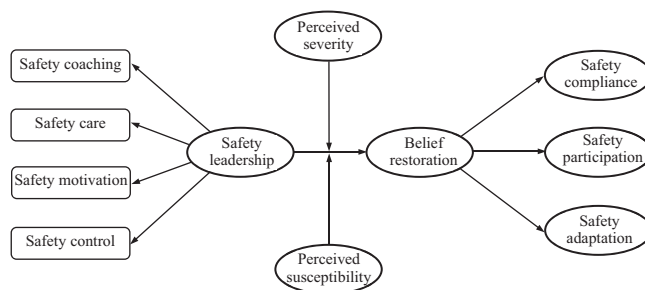
*H4.* PSU (*H4a*) and severity (*H4b*) negatively moderate the mediation effect of “safety leadership – belief restoration – safety behavior.”

The conceptual model is presented in [Figure 1](#).

## Methodology

### Questionnaire design

The questionnaire was comprising two sections. The first section included four scales for safety leadership, belief restoration, perceived risk and safety behavior ([Appendix](#)). A total of 18 items based on [Wu \(2008\)](#) and [Lu and Yang \(2010\)](#) were adapted to measure safety leadership, which was a second-order factor composed of safety coaching, caring, motivation and control. Four items based on the measurement of efficiency belief and self-belief were used to measure belief restoration ([Rimal and Real, 2003](#); [Turner \*et al.\*, 2006](#);



**Figure 1.**  
Research conceptual  
model

Witte, 1996). Nine items proposed by Witte (1996) measured perceived risk, including the two dimensions of perceived susceptibility and severity. Safety behavior had the three dimensions of safety compliance, participation and adaptation. Safety compliance and participation were measured by using the instrument proposed by Neal and Griffin (2006), with each being measured by three items. Three items based on the employee adaptive behavior scale (Leischnig and Kasper-Brauer, 2015) and the innovative behavior scale developed by Scott and Bruce (1994) were adapted to measure safety adaptation. Some items were slightly revised according to the COVID-19 and hospitality contexts, and the English scales were translated and checked by an expert committee, consisting of two hospitality professors and four PhD students. Each item was measured from “strongly disagree (1)” to “strongly agree (7).”

The second section of this questionnaire was the demographic variables, including gender, marital status, age, education, position, work experience, monthly income and hotel department.

#### *Data collection*

A pilot survey was conducted in four Chinese star-rated hotels in early February 2020 and 139 valid responses were received. The reliability and validity of each construct were tested. The results showed that the Cronbach's  $\alpha$  for each construct were all above 0.8, suggesting good internal consistency for these scales. In addition, the Kaiser-Meyer-Olkin (KMO) indexes of each construct were all above 0.7, indicating good validity structure of the questionnaire.

To ensure the representativeness, 23 star-rated hotels, still in operation during COVID-19, from 13 regions of China were surveyed from February 20 to March 5, 2020. Hotels in east China (Fujian, Zhejiang), north China (Shanxi, Beijing), central China (Hunan, Hubei), south China (Guangdong, Guangxi), southwest China (Sichuan, Guizhou), northwest China (Shanxi, Xinjiang) and Northeast China (Jilin) were selected. To avoid the health risks caused by pandemic infection, the survey was conducted through convenience sampling and distributed online. The hyperlink to the questionnaire, completion requirements and research purposes were sent to each hotel's human resources (HR) managers for checking, and then were forwarded to employees at various positions and departments with their assistance. In total, 1,896 questionnaires were returned with 1,594 valid ones, yielding an 84.1% effective response rate.

## **Results**

### *Characteristics of respondents*

The profile of the respondents is shown in [Table 1](#).

### *Common method variance*

The order of items was varied in the questionnaires, a few items were set in the reverse direction, and the assurance of anonymity were steps taken to avoid common method variance (CMV) in the data collection. Then, Harman's single-factor test was performed by including all items for the principal component analysis (PCA) without rotation. The results presented that the KMO index was 0.953 ( $>0.7$ ) and the first component explained 37.8% ( $<40\%$ ) of CMV (Podsakoff *et al.*, 2003). In addition, the variance inflation factor (VIF) of each regression was tested to avoid collinearity. The results showed that the VIF of each variable was lower than the threshold of three (Kim *et al.*, 2012). Thus, CMV was not a major concern in this research.



Category	Frequency	Rate (%)
<i>Gender</i>		
Male	609	38.2
Female	985	61.8
<i>Marital</i>		
Married	1,182	74.2
Unmarried	412	25.8
<i>Age</i>		
20 or below	33	2.1
20–29	386	24.2
30–39	445	27.9
40–49	514	32.2
50–59	201	12.6
60 or above	15	0.9
<i>Education</i>		
Junior high college or below	519	32.6
Senior high school	525	32.9
Junior college	326	20.5
Bachelor's degree	210	13.2
Master's degree or above	14	0.9
<i>Position</i>		
Trainee	47	2.9
Junior staff	759	47.6
Foreman	140	8.8
Supervisor	313	19.6
Manager	239	15.0
Director	96	6.0
<i>Monthly income (CNY)</i>		
≤2,500	530	33.2
2,501–5,000	740	46.4
5,001–10,000	252	15.8
10,001–20,000	48	3.0
≥20,001	24	1.5
<i>Work experience (years)</i>		
Less than one	226	14.2
1–3	367	23.0
3–5	234	14.7
5–10	338	21.2
More than 10	429	26.9
<i>Department</i>		
Front office	286	17.9
Food and beverage	257	16.1
Housekeeping	360	22.6
Entertainment	51	3.2
Security	46	2.9
Kitchen	113	7.1
Finance	97	6.1
Sales	59	3.7
Engineering	72	4.5
Human resources	61	3.8

**Note:** CNY = China Yuan

**Table 1.**  
Respondent profile  
(*n* = 1,594)

*Reliability and validity tests*

Exploratory factor analysis (EFA) with PCA through SPSS 22.0 was conducted to examine the reliability and validity of questionnaire data (Tables 2 and 3). The EFA results showed that Cronbach's  $\alpha$  for belief restoration (0.880), perceived susceptibility (0.917), perceived severity (0.842), safety compliance (0.832), safety participation (0.868), safety adaptation (0.871), safety coaching (0.919), safety control (0.918), safety motivation (0.875) and safety care (0.947) were all over 0.8, indicating that the questionnaire items had reasonably good internal consistency. The KMO index of these constructs ranged from 0.706 to 0.897, and the factor loading coefficients of each item were above 0.5, suggesting a sound validity structure of the questionnaire.

Confirmatory factor analysis (CFA) through AMOS 21.0 was conducted to examine the convergent and discriminant validities of each construct (Tables 2 and 3). The CFA results were above the suggested levels (Hooper *et al.*, 2008):  $\chi^2/df = 3.516$  ( $<1$ ,  $<5$ ), root mean square error of approximation (RMSEA) = 0.040 ( $<0.05$ ), standardized root mean square residual (SRMR) = 0.046 ( $<0.05$ ), adjusted goodness of fit index (AGFI) = 0.910 ( $>0.9$ ), goodness of fit index (GFI) = 0.922 ( $>0.9$ ), normed fit index (NFI) = 0.951 ( $>0.9$ ), relative fit index (RFI) = 0.946 ( $>0.9$ ), ILI = 0.965 ( $>0.9$ ), Tucker-Lewis index (TLI) = 0.961 ( $>0.9$ ), comparative fit index (CFI) = 0.965 ( $>0.9$ ), Parsimony-adjusted GFI (PGFI) = 0.798 ( $>0.5$ ), suggesting that the model fitted well with the actual data. Moreover, the standard factor loadings and average variances extracted (AVEs) of each construct were over 0.5 and the composite reliabilities (CRs) were more than 0.8, indicating good convergent validity.

*Correlation analysis*

As presented in Table 4, there were strong correlations among pairs of the main constructs. The square root of the AVEs for each factor were larger than the correlations of specific factors with any of the other factors, confirming the discriminant validity of each construct.

*Mediation effect of belief restoration*

To test the direct and indirect hypotheses, structural equation modeling provided by AMOS 21.0 was conducted, which provides indirect effect estimates for serial multiple mediators and confidence intervals (CIs) derived from the bootstrap distribution with 2,000 bootstrap estimates. Among these 1,594 respondents, there was good fit with the data ( $\chi^2/df = 5.389$ , RMSEA = 0.052, SRMR = 0.0488, AGFI = 0.891, GFI = 0.908, NFI = 0.947, RFI = 0.941, incremental fit index (IFI) = 0.956, TLI = 0.951, CFI = 0.956, PGFI = 0.765). Although  $\chi^2/df$  was slightly greater than five, this is acceptable if the sample size is large ( $>1,500$ ) and could be used for further hypothesis testing (Hooper *et al.*, 2008).

Regarding direct effects, safety leadership had a positive and significant impact on safety compliance ( $\beta = 0.548$ ,  $p = 0.001$ ), safety participation ( $\beta = 0.419$ ,  $p = 0.001$ ) and safety adaptation ( $\beta = 0.579$ ,  $p = 0.001$ ), supporting *H1a*, *H1b* and *H1c*. In addition, safety leadership had a positive and significant impact on belief restoration ( $\beta = 0.365$ ,  $p = 0.001$ ), and belief restoration had a positive and significant impact on safety compliance ( $\beta = 0.254$ ,  $p = 0.001$ ), safety participation ( $\beta = 0.104$ ,  $p = 0.001$ ) and safety adaptation ( $\beta = 0.133$ ,  $p = 0.001$ ) (Table 5). Regarding indirect effects, belief restoration partially mediated the effect of safety leadership on compliance (SL  $\rightarrow$  BR  $\rightarrow$  SCOM; 0.093,  $p = 0.001$ , CI: 0.070–0.120); participation (SL  $\rightarrow$  BR  $\rightarrow$  SPAR; 0.038,  $p = 0.001$ , CI: 0.019–0.062); and adaptation (SL  $\rightarrow$  BR  $\rightarrow$  SADA; 0.049,  $p = 0.001$ , CI: 0.027–0.076), supporting *H2* (Figure 2).

Constructs	Items	Mean	EFA			CFA		CR	
			Factor loadings	KMO	Cronbach's $\alpha$	Factor loadings	T value		AVE
BR	BR01	5.84	0.786	0.819	0.880	0.688	—	0.6582	0.8843
	BR02	5.90	0.888			0.850	30.240		
	BR03	5.50	0.901			0.880	30.973		
	BR04	5.40	0.858			0.814	29.173		
PSU	RP01	5.94	0.874	0.839	0.917	0.809	—	0.7344	0.9169
	RP02	5.90	0.885			0.826	37.882		
	RP03	5.69	0.921			0.914	43.371		
	RP04	5.71	0.898			0.875	41.012		
Perceived severity (PSE)	RS01	6.19	0.688	0.819	0.842	0.602	—	0.5190	0.8419
	RS02	6.58	0.737			0.666	20.706		
	RS03	6.11	0.845			0.753	22.283		
	RS04	6.27	0.851			0.843	23.538		
	RS05	6.19	0.82			0.715	21.499		
Safety compliance	SC01	6.20	0.84	0.717	0.832	0.734	—	0.6477	0.8461
	SC02	6.55	0.886			0.838	31.480		
	SC03	6.39	0.891			0.838	31.484		
Safety participation	SP01	6.17	0.863	0.706	0.868	0.758	—	0.7129	0.8808
	SP02	6.35	0.931			0.939	36.951		
	SP03	6.28	0.891			0.826	34.264		
Safety adaptation	SA01	5.94	0.887	0.739	0.871	0.822	—	0.6973	0.8735
	SA02	6.18	0.905			0.869	38.591		
	SA03	5.87	0.887			0.813	35.948		

**Table 2.**  
EFA and CFA of  
belief restoration,  
perceived risk and  
safety behavior  
( $n = 1,594$ )

**Table 3.**  
Second-order factor  
structure validation  
of safety leadership  
(*n* = 1,594)

Constructs	Items	Mean	EFA			CFA			CR	
			Factor loadings	KMO	Cronbach's $\alpha$	Factor loadings	T value	Coefficient		AVE
SL Safety coaching	SL01	6.47	0.875	0.849	0.919	0.836	42.315	0.956	0.8897	0.9699
	SL02	6.40	0.904			0.869	45.270			
	SL03	6.34	0.922			0.899	48.148			
	SL04	6.30	0.891			0.847	—			
Safety control	SL05	6.34	0.873	0.874	0.918	0.863	39.506	0.914		
	SL06	6.47	0.902			0.904	42.109			
	SL07	6.43	0.862			0.813	36.412			
	SL08	6.21	0.853			0.778	40.437			
Safety motivation	SL09	6.34	0.867			0.793	—			
	SL10	6.26	0.806	0.808	0.875	0.831	26.444	0.934		
	SL11	5.82	0.874			0.704	32.594			
	SL12	6.06	0.878			0.788	31.918			
Safety care	SL13	5.68	0.859			0.634	—			
	SL14	6.31	0.909	0.897	0.947	0.869	—	0.968		
	SL15	6.26	0.909			0.862	57.308			
	SL16	6.47	0.918			0.901	51.840			
	SL17	6.40	0.930			0.916	53.827			
	SL18	6.46	0.886			0.870	48.267			

*Moderation effect of perceived susceptibility*

According to Hayes' (2013) and Wen and Ye's (2014) suggestions, the moderated mediation effect is confirmed if the results satisfy any of the following conditions. First, the perceived risk moderated the relationship between safety leadership and belief restoration, and belief restoration had a significant impact on the safety behavior. Second, perceived risk moderated the relationship between belief restoration and safety behavior, and safety leadership had a significant impact on belief restoration. Third, perceived risk both moderated the relationship between safety leadership and belief restoration, and the relationship between belief restoration and safety behavior.

Therefore, hierarchical regression provided by SPSS 21.0 was applied to examine the moderation effect of perceived risk (susceptibility and severity) on the direct and mediated effects of safety leadership and safety behavior. To avoid the causal error by respondent characteristics and the influence of multiple collinear relationships among variables, this

Constructs	1	2	3	4	5	6	7	VIF
SL	(0.943)							1.553
BR	0.351**	(0.811)						1.255
PSU	0.108**	-0.084**	(0.857)					1.085
PSE	0.221**	0.092**	0.216**	(0.720)				1.108
Safety compliance	0.556**	0.399**	0.126**	0.224**	(0.844)			1.824
Safety participation	0.396**	0.221**	0.108**	0.134**	0.506**	(0.805)		1.382
Safety adaptation	0.562**	0.302**	0.131**	0.210**	0.583**	0.460**	(0.835)	-
Mean	6.28	5.66	5.81	6.27	6.38	6.27	6.00	
S.E.	0.91	1.30	1.43	1.02	0.86	1.03	1.07	

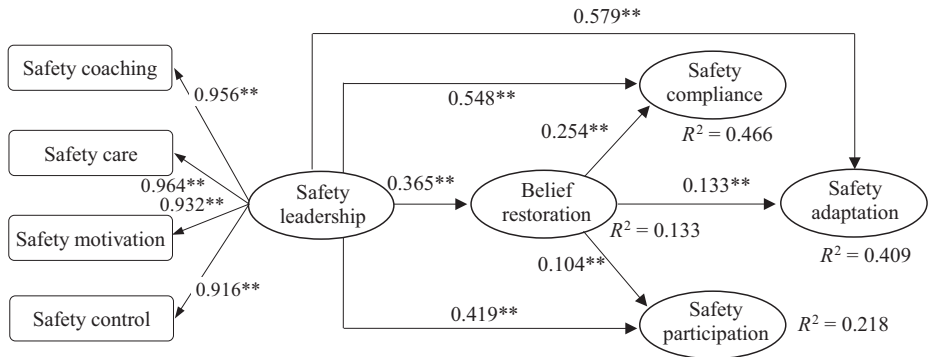
**Note:** The diagonal element is the square root of the extracted mean variance

**Table 4.**  
Correlation analysis  
between constructs  
( $n = 1,594$ )

Path	Estimate	S.E.	Bias-corrected 95% CI		<i>p</i> -value
			Lower	Higher	
<i>Direct effect</i>					
BR → SCOM	0.254	0.031	0.195	0.315	0.001
BR → SPAR	0.104	0.030	0.051	0.168	0.001
BR → SADA	0.133	0.032	0.071	0.196	0.001
SL → BR	0.365	0.029	0.309	0.422	0.001
SL → SCOM	0.548	0.035	0.474	0.611	0.001
SL → SPAR	0.419	0.035	0.352	0.486	0.001
SL → SADA	0.579	0.032	0.515	0.641	0.001
<i>Indirect effect</i>					
SL → BR → SCOM	0.093	0.013	0.070	0.120	0.001
SL → BR → SPAR	0.038	0.011	0.019	0.062	0.001
SL → BR → SADA	0.049	0.012	0.027	0.076	0.001
<i>Total effect</i>					
SL → SCOM	0.640	0.030	0.577	0.693	0.001
SL → SPAR	0.457	0.031	0.393	0.516	0.001
SL → SADA	0.627	0.027	0.572	0.679	0.001

**Table 5.**  
Structural equation  
modeling

**Figure 2.**  
Structural equation  
modeling

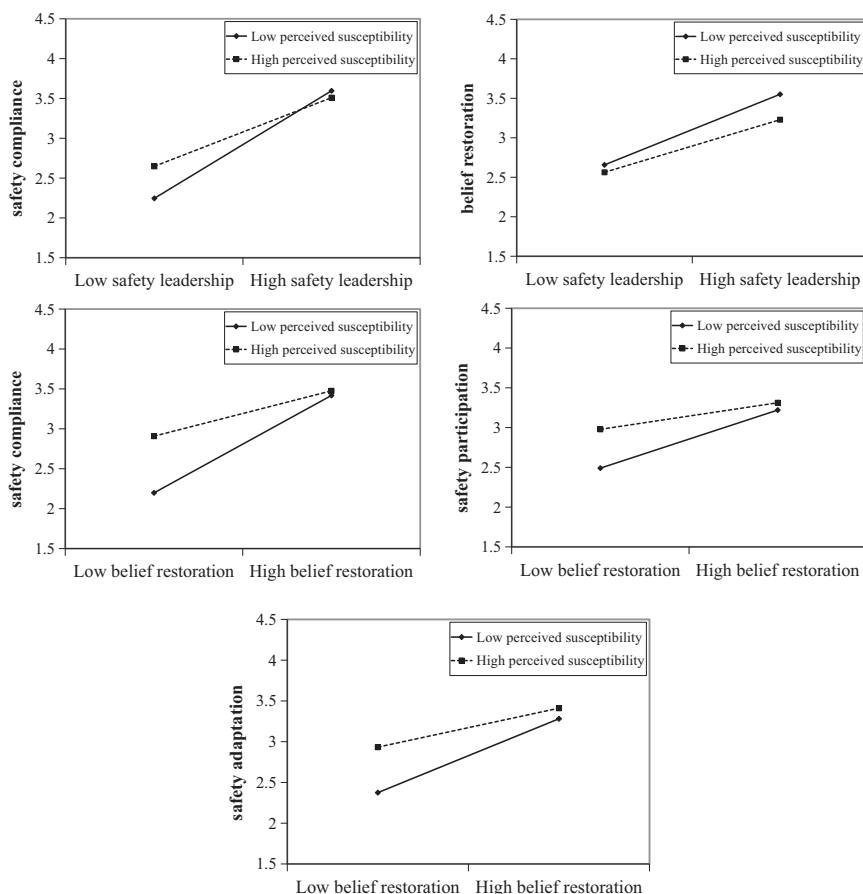


research controlled for the demographic variables during the analysis of moderation effects and centralized the independent (mediating) and moderating variables to obtain interaction terms.

Table 6 and Figure 3 presents the moderation effect of perceived susceptibility between safety leadership and behavior. In equation (1), safety leadership positively affected employee safety compliance ( $\beta = 0.553, t = 26.153$ ) and the interaction term (SL  $\times$  PSU) negatively affected employee safety compliance ( $\beta = -0.122, t = -5.912$ ). In equation (7), safety leadership positively affected employee belief restoration ( $\beta = 0.390, t = 16.669$ ) and the interaction term (SL  $\times$  PSU) negatively affected employee belief restoration ( $\beta = -0.057, t = -2.505$ ). In equation (2), belief restoration positively affect employee safety

Variables	Safety compliance		Safety participation		Safety adaptation		BR
	E1 $\beta$	E2 $\beta$	E3 $\beta$	E4 $\beta$	E5 $\beta$	E6 $\beta$	E7 $\beta$
<i>Control variables</i>							
Gender	0.000	0.046	-0.007	0.021	-0.038	-0.002	-0.050*
Marital status	0.008	-0.035	-0.005	-0.035	-0.017	-0.061*	0.056
Age	-0.067*	-0.035	-0.086**	-0.063	0.017	0.05	0.010
Education	-0.038	0.004	0.035	0.060*	-0.005	0.027	-0.089**
Department	-0.056*	-0.002	-0.057*	-0.025	-0.040	0.002	-0.126***
Position	0.017	0.126***	0.116***	0.186***	0.100***	0.197***	-0.154***
Monthly income	0.009	0.034	-0.029	-0.009	-0.021	0.006	0.050
Work experience	0.007	-0.038	0.027	-0.003	0.020	-0.022	0.076*
<i>Independent variables</i>							
SL	0.553***		0.382***		0.536***		0.390***
PSU	0.079***	0.192***	0.069*	0.145***	0.072**	0.172***	-0.104***
BR		0.447***		0.266***		0.346***	
<i>Interaction terms</i>							
SL $\times$ PSU	-0.122***		-0.040		-0.008		-0.057*
BR $\times$ PSU		-0.163***		-0.099***		-0.107***	
$R^2$	0.338	0.228	0.186	0.117	0.334	0.180	0.192
Adj- $R^2$	0.333	0.223	0.180	0.111	0.329	0.175	0.186
F	73.267	42.446	32.893	19.019	72.108	31.668	34.091

**Table 6.**  
Moderation effect of  
perceived  
susceptibility



**Figure 3.**  
Moderation effect of  
perceived  
susceptibility

compliance ( $\beta = 0.447, t = 19.588$ ) and the interaction term ( $BR \times PSU$ ) negatively affected employee safety compliance ( $\beta = -0.163, t = -7.169$ ). This result showed that perceived susceptibility moderated the direct and indirect effects (before and after) of “safety leadership – belief restoration – safety compliance.”

In equation (3), safety leadership positively affected employee safety participation ( $\beta = 0.382, t = 16.289$ ) and the interaction term ( $SL \times PSU$ ) had no impact on safety participation ( $\beta = -0.040, t = -1.774$ ). In equation (4), belief restoration positively affected employee safety participation ( $\beta = 0.266, t = 10.907$ ) and the interaction term ( $BR \times PSU$ ) negatively affected employee safety participation ( $\beta = -0.099, t = -4.072$ ). This result showed that perceived susceptibility moderated the indirect effect (before and after) of “safety leadership – belief restoration – safety participation.”

In equation (5), safety leadership positively affected employee safety adaptation ( $\beta = 0.536, t = 25.263$ ) and the interaction term ( $SL \times PSU$ ) had no impact on safety adaptation ( $\beta = -0.008, t = -0.380$ ). In equation (6), belief restoration positively affected employee safety adaptation ( $\beta = 0.346, t = 14.742$ ) and the interaction term ( $BR \times PSU$ ) negatively affected employee safety adaptation ( $\beta = -0.107, t = -4.563$ ). This result showed that perceived susceptibility moderated the indirect effect (before and after) of “safety leadership

– belief restoration – safety adaptation.” Therefore, these results provided support for *H3a* and *H4a*.

*Moderation effect of perceived severity*

Table 7 and Figure 4 presents the moderation effect of perceived severity between safety leadership and behavior. In equation (1), safety leadership positively affected employee safety compliance ( $\beta = 0.531, t = 24.339$ ) and the interaction term (SL  $\times$  PSE) negatively affected employee safety compliance ( $\beta = -0.080, t = -3.775$ ). In equation (7), safety leadership positively affected employee belief restoration ( $\beta = 0.376, t = 15.522$ ) and the interaction term (SL  $\times$  PSE) had no significant impact on belief restoration ( $\beta = -0.008, t = -0.352$ ). In equation (2), belief restoration positively affected employee safety compliance ( $\beta = 0.403, t = 17.643$ ) and the interaction term (BR  $\times$  PSE) negatively affected employee safety compliance ( $\beta = -0.087, t = -3.887$ ). This result showed that perceived severity moderated the direct and indirect effects (after) of “safety leadership – belief restoration – safety compliance.”

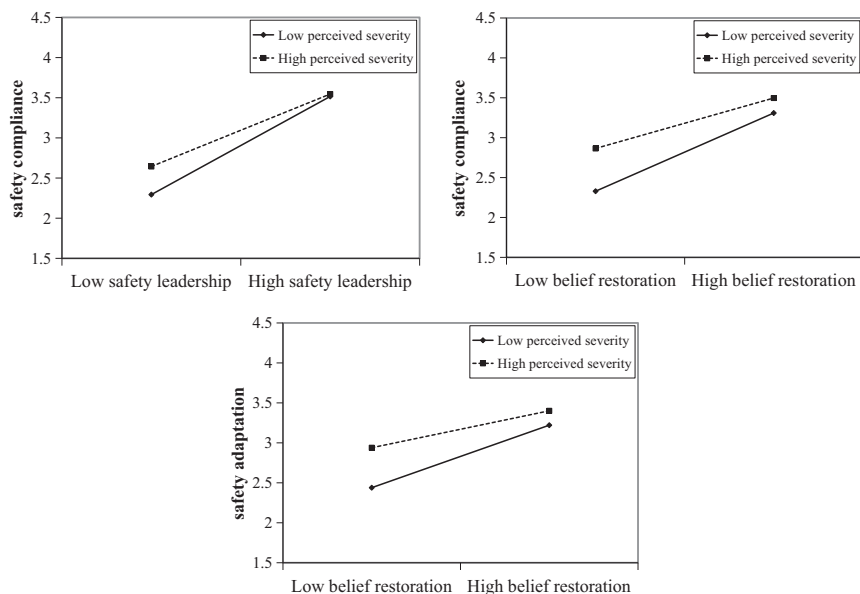
In equation (3), safety leadership positively affected employee safety participation ( $\beta = 0.377, t = 15.609$ ) and the interaction term (SL  $\times$  PSE) had no impact on safety participation ( $\beta = -0.016, t = -0.671$ ). In equation (4), belief restoration positively affected employee safety participation ( $\beta = 0.237, t = 9.683$ ) and the interaction term (BR  $\times$  PSE) had no impact on safety participation ( $\beta = -0.038, t = -1.581$ ). This result showed that the perceived severity had no moderation effect on the direct and indirect effect (before and after) of “safety leadership – belief restoration – safety participation.”

In equation (5), safety leadership positively affected employee safety adaptation ( $\beta = 0.527, t = 24.228$ ) and the interaction term (SL  $\times$  PSE) had no impact on safety adaptation ( $\beta = 0.022, t = 1.058$ ). In equation (6), belief restoration positively affected employee safety

Variables	Safety compliance		Safety participation		Safety adaptation		BR
	E1 $\beta$	E2 $\beta$	E3 $\beta$	E4 $\beta$	E5 $\beta$	E6 $\beta$	E7 $\beta$
<i>Control variables</i>							
Gender	0.006	0.044	-0.005	0.019	-0.036	-0.003	-0.045
Marital status	0.016	-0.030	-0.004	-0.035	-0.014	-0.057	0.067*
Age	-0.061*	-0.031	-0.084**	-0.060	0.020	0.054	0.013
Education	-0.031	0.009	0.040	0.065*	0.002	0.033	-0.096**
Department	-0.056*	0.001	-0.055*	-0.022	-0.036	0.005	-0.130***
Position	0.023	0.137***	0.120***	0.195***	0.105***	0.206***	-0.159***
Monthly income	-0.001	0.004	-0.037	-0.029	-0.029	-0.019	0.062*
Work experience	0.005	-0.043	0.024	-0.008	0.017	-0.027	0.086**
<i>Independent variables</i>							
SL	0.531***		0.377***		0.527***		0.376***
PSE	0.095***	0.181***	0.049*	0.109***	0.094***	0.170***	0.011
BR		0.403***		0.237***		0.311***	
<i>Interaction terms</i>							
SL $\times$ PSE	-0.080***		-0.016		0.022		-0.008
BR $\times$ PSE		-0.087***		-0.038		-0.080**	
$R^2$	0.335	0.219	0.183	0.106	0.337	0.184	0.177
Adj- $R^2$	0.330	0.214	0.177	0.100	0.333	0.178	0.172
F	72.332	40.409	32.205	17.041	73.166	32.337	31.003

**Table 7.**  
Moderation effect of  
perceived severity





**Figure 4.**  
Moderation effect of  
perceived severity

adaptation ( $\beta = 0.311, t = 13.324$ ) and the interaction term ( $BR \times PSE$ ) negatively affected employee safety adaptation ( $\beta = -0.080, t = -3.485$ ). This result showed that perceived severity moderated the indirect effect (after) of “safety leadership – belief restoration – safety adaptation.” Therefore, these results provided partial support for *H3b* and *H4b*.

## Conclusions and implications

### Conclusions

Based on SDT, and with the background of the COVID-19 pandemic, this research explored the impact of hotel safety leadership on employee belief restoration and safety behavior. The moderation effect of perceived risk was investigated based on the substitutes for leadership concept. The main conclusions are as follows.

First, hotel safety leadership positively predicted employee safety behavior. The results showed that safety leadership had a significant and positive impact on employee safety compliance, participation and adaptation, which was consistent with the results of [Clarke \(2013\)](#) and [Xue et al. \(2020\)](#), SL had the largest upward effect on safety compliance, followed by safety adaptation and participation. These results suggested that safety leadership encourages employees to comply with safety systems, maintain workplace safety and learn new safety skills to improve hotel safety performance.

Second, belief restoration partially mediated the impact of safety leadership on behavior. Specifically, belief restoration partially mediated the impact of safety leadership on compliance, participation and adaptation and implying that it is an important mediation variable for predicting employee safety behavior. These results demonstrated the cognitive and mediation processes of safety leadership effects on safety behavior during a major crisis.

Third, perceived risk negatively moderated the direct and the mediation effect of “safety leadership – belief restoration – safety behavior.” The results showed that perceived

susceptibility and severity negatively moderated the impact of safety leadership on safety compliance, suggesting that perceived risk partially substituted for the task-oriented elements of safety leadership and weakened the direct effect of safety leadership on compliance. The results for the moderated mediation model showed that the higher the perceived risk and/or the lower the belief restoration, the weaker was the effect of hotel safety leadership on employee safety behavior during COVID-19, which is a significant conclusion not found in previous research.

#### *Theoretical implications*

First, this investigation expanded the research on the effectiveness of safety leadership and especially with respect to safety in the hospitality industry during a major global crisis. Employee safety behavior is a critical indicator of workplace safety and performance and its influencing factors are widely researched (Chen and Chen, 2014; Neal *et al.*, 2000; Wang *et al.*, 2019; Wu, 2005). Importantly, organizational leadership is closely related to employee safety behavior and corporate safety performance. The impact of different leadership styles on employee safety behavior has been investigated in normal operating conditions, and the effectiveness of safety leadership has been confirmed in diverse high-risk occupations as well such as construction, nuclear power plants, container terminal operations and university and college laboratories (Gracia *et al.*, 2020; Lu and Yang, 2010; Stiles *et al.*, 2018; Wu, 2005; Wu, 2008). This research explored and confirmed the effect of safety leadership on behavior in the context of a pandemic that affected hotel services. This not only broadens the research on safety leadership but also provides new insights on influential factors of hotel employee safety behavior. In addition, this research provides a theoretical basis for motivating and fostering hotel employee safety behaviors during crises.

Second, based on SDT, this research elaborated on the effect of organizational safety leadership on employee safety behavior and provides a theoretical basis for analyzing the psychological mediation processes in promoting employee safety behavior in crisis situations. The psychological mediation process of employee belief and motivation between organization leadership and employee behavior has become an important topic (Kim *et al.*, 2019; Li *et al.*, 2020; Ma *et al.*, 2018). Combined with SDT, relationship-oriented leadership strategies (e.g. safety coaching, safety care) are inducements for autonomous motivation and task-oriented leadership strategies (e.g. safety motivation, safety control) are inducers of controlled motivation and belief restoration reflects the intrinsic motivation of employees in crisis contexts. This research revealed the mediation effect of belief restoration between safety leadership and safety behavior. The theoretical contribution of this research is in the integration of the safety performance model and SDT, which helps to develop motivation theory in safety research, as well as explaining the psychological mediation process that promotes employee safety behavior. Also, this research extends the application of SDT in crisis situations and in hospitality occupational safety.

Third, based on the substitutes for leadership concept, this research uncovered the effectiveness of safety leadership during a major crisis. The substitutes for leadership concept has been very widely explored (Hussain *et al.*, 2016). The concept proposes that certain individual, task and organizational variables can provide guidance and positive feelings for employees and act as “substitutes for leadership” (Kerr and Jermier, 1978). In this research, perceived risk represented an external risk environment variable and individual perception variable and revealed its moderation role in the direct and mediated effects of “safety leadership – belief restoration – safety behavior.” This research indicates that perceived risk is an important substitute variable that influences the effectiveness of

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safety leadership in the context of an epidemic in China, which provides new evidence and a theoretical basis for analyzing the impact and boundary conditions of safety leadership.

#### *Practical implications*

First, hotels should develop management strategies based on safety leadership and motivate and promote employee safety behavior from four aspects – safety coaching, care, motivation and control. Regarding safety coaching, hotel managers should become role models for the safety behavior of staff and provide employees with sufficient safety knowledge and safety guidance. Regarding safety care, hotel managers should meet the safety needs of employees and develop a safe workplace, as well as providing enough resources to support employee safety behavior. For safety motivation, hotel managers should establish safety motivation systems and reward employees for behaviors that are conducive to improving safety performance, such as adhering to safety systems, participating in safety training and proposing new safety ideas. Regarding safety control, hotel managers should establish safety management systems and safety behavioral norms and improve hotel safety performance through monitoring employee safety performance and correcting unsafe behaviors.

Second, hotels should pay attention to belief restoration during crises and provide psychological motivation for employees to adopt safety behaviors. Hotel managers should care about employee needs and psychological status during the crisis, provide employees with positive and sufficient safety information, as well as demonstrating the hotel's crisis response capabilities. To enhance employee positive expectations and confidence of crisis intervention, hotel managers should provide positive feedback on employees' safety concerns. In the context of events such as COVID-19, hotel managers should develop an organizational atmosphere that supports safety, conduct systematic safety skills training and provides sufficient protective equipment. This will assist with improving employee safety performance and could be instrumental in enhancing employee belief restoration.

Third, hotels should strengthen the management of employees' perceived risk during a crisis and implement appropriate risk information intervention measures. Specifically, hotel managers should provide employees with real and objective crisis information. Most importantly, hotel managers should help employees to objectively understand the risk factors and enhance their knowledge and ability to respond to a crisis. In addition, hotel managers should avoid spreading rumors and promote positive information, such as about hotel safety response strategies and safety management effectiveness, thereby reducing employee perceived risk.

#### *Limitations and future research directions*

This research has several limitations. First, the data were collected with the same measurement system within a certain period of time. Future research should apply a longitudinal and paired sample design to confirm these conclusions. Second, based on the COVID-19 crisis context, this research investigated the effect of safety leadership on safety behavior in Chinese hotels. To improve the validity and generalizability of this conceptual model, future research should test and expand it in different crises, business fields and other cultural backgrounds. Third, this research confirmed the impact of safety leadership on employee safety behavior based on SDT. Future research should confirm and expand this conceptual model based on different theories in relation to crisis management (e.g. signal theory, information integration theory). Also, future research can explore the antecedents of employee safety behavior from organizational (e.g. safety climate, corporate social

responsibility) and individual levels (e.g. safety motivation, safety knowledge), which will further advance the knowledge about the formation of employee safety behaviors.

### References

- Ajzen, I. (1991), "The theory of planned behavior", *Organizational Behavior and Human Decision Processes*, Vol. 50 No. 2, pp. 179-211.
- Avci, C. and Yayli, A. (2014), "Examining safety behaviour with the safety climate and the theory of planned behaviour", Paper presented at the International Journal of Arts and Sciences' (IJAS) International Conference for Academic Disciplines, Venice, 8 December.
- Bandura, A. (1977), *Social Learning Theory*, Prentice-Hall, Englewood Cliffs, NJ.
- Barling, J., Loughlin, C. and Kelloway, E.K. (2002), "Development and test of a model linking safety-specific transformational leadership and occupational safety", *Journal of Applied Psychology*, Vol. 87 No. 3, pp. 488-496.
- Baum, T. and Hai, N.T.T. (2020), "Hospitality, tourism, human rights and the impact of COVID-19", *International Journal of Contemporary Hospitality Management*, Vol. 32 No. 7, pp. 2397-2407.
- Chan, D.K., Fung, Y.K., Xing, S. and Hagger, M.S. (2014), "Myopia prevention, near work, and visual acuity of college students: integrating the theory of planned behavior and self-determination theory", *Journal of Behavioral Medicine*, Vol. 37 No. 3, pp. 369-380.
- Chen, C.F. and Chen, S.C. (2014), "Investigating the effects of job demands and job resources on cabin crew safety behaviors", *Tourism Management*, Vol. 41, pp. 45-52.
- Christian, M.S., Bradley, J.C., Wallace, J.C. and Burke, M.J. (2009), "Workplace safety: a meta-analysis of the roles of person and situation factors", *Journal of Applied Psychology*, Vol. 94 No. 5, pp. 1103-1127.
- Clarke, S. (2013), "Safety leadership: a meta-analytic review of transformational and transactional leadership styles as antecedents of safety behaviours", *Journal of Occupational and Organizational Psychology*, Vol. 86 No. 1, pp. 22-49.
- Coun, M., Peters, P. and Blomme, R. (2019), "Let's share! the mediating role of employees' self-determination in the relationship between transformational and shared leadership and perceived knowledge sharing among peers", *European Management Journal*, Vol. 37 No. 4, pp. 481-491.
- Deci, E.L. and Ryan, R.M. (1985a), "The general causality orientations scale: self-determination in personality", *Journal of Research in Personality*, Vol. 19 No. 2, pp. 109-134.
- Deci, E.L. and Ryan, R.M. (1985b), "Intrinsic motivation and self-determination in human behavior", *Perspectives in Social Psychology*, Springer.
- Fong, L.H.N., Law, R. and Ye, B.H. (2020), "Outlook of tourism recovery amid an epidemic: importance of outbreak control by the government", *Annals of Tourism Research*, p. 102951.
- Gagné, M. and Deci, E.L. (2005), "Self-determination theory and work motivation", *Journal of Organizational Behavior*, Vol. 26 No. 4, pp. 331-362.
- Ghosh, A. and Shum, C. (2019), "Why do employees break rules? Understanding organizational rule-breaking behaviors in hospitality", *International Journal of Hospitality Management*, Vol. 81, pp. 1-10.
- Gracia, F.J., Tomás, I., Martínez-Córcoles, M. and Peiró, J.M. (2020), "Empowering leadership, mindful organizing and safety performance in a nuclear power plant: a multilevel structural equation model", *Safety Science*, Vol. 123, pp. 1-9.
- Griffin, M.A. and Hu, X. (2013), "How leaders differentially motivate safety compliance and safety participation: the role of monitoring, inspiring, and learning", *Safety Science*, Vol. 60, pp. 196-202.
- Griffin, M.A. and Neal, A. (2000), "Perceptions of safety at work: a framework for linking safety climate to safety performance, knowledge, and motivation", *Journal of Occupational Health Psychology*, Vol. 5 No. 3, pp. 347-358.

- Guo, M., Liu, S., Chu, F., Ye, L. and Zhang, Q. (2019), "Supervisory and coworker support for safety: buffers between job insecurity and safety performance of high-speed railway drivers in China", *Safety Science*, Vol. 117, pp. 290-298.
- Harris, L.C. and Ogbonna, E. (2002), "Exploring service sabotage: the antecedents, types, and consequences of frontline, deviant, antiservice behavior", *Journal of Service Research*, Vol. 4 No. 3, pp. 163-183.
- Hayes, A. (2013), "Introduction to mediation, moderation, and conditional process analysis", *Journal of Educational Measurement*, Vol. 51 No. 3, pp. 335-337.
- Heinrich, H.W. (1931), *Industrial Accident Prevention: A Scientific Approach*, Mc GrawHill Book Company, New York, NY and London.
- Hobfoll, S.E. (1989), "Conservation of resources: a new attempt at conceptualizing stress", *American Psychologist*, Vol. 44 No. 3, pp. 513-524.
- Homans, G.C. (1985), "Social behavior as exchange", *American Journal of Sociology*, Vol. 63 No. 6, pp. 597-606.
- Hooper, D., Coughlan, J. and Mullen, M. (2008), "Structural equation modelling: guidelines for determining model fit", *The Electronic Journal of Business Methods*, Vol. 6 No. 1, pp. 53-60.
- Huang, X., Dai, S. and Xu, H. (2020), "Predicting tourists' health risk preventative behaviour and travelling satisfaction in Tibet: combining the theory of planned behaviour and health belief model", *Tourism Management Perspectives*, Vol. 33, pp. 1-10.
- Hussain, G., Ismail, W.K.W., Rashid, M.A. and Nisar, F. (2016), "Substitutes for leadership: alternative perspectives", *Management Research Review*, Vol. 39 No. 5, pp. 546-568.
- Israeli, A.A., Mohsin, A. and Kumar, B. (2011), "Hospitality crisis management practices: the case of Indian luxury hotels", *International Journal of Hospitality Management*, Vol. 30 No. 2, pp. 367-374.
- Ji, M., Liu, B., Li, H., Yang, S. and Li, Y. (2019), "The effects of safety attitude and safety climate on flight attendants' proactive personality with regard to safety behaviors", *Journal of Air Transport Management*, Vol. 78, pp. 80-86.
- Jiang, Y. and Wen, J. (2020), "Effects of COVID-19 on hotel marketing and management: a perspective article", *International Journal of Contemporary Hospitality Management*, doi: [10.1108/IJCHM-03-2020-0237](https://doi.org/10.1108/IJCHM-03-2020-0237).
- Johnston, D.M. and Johnson, N.R. (1989), "Role extension in disaster: employee behavior at the Beverly hills supper club fire", *Sociological Focus*, Vol. 22 No. 1, pp. 39-51.
- Kelloway, E.K., Mullen, J. and Francis, L. (2006), "Divergent effects of transformational and passive leadership on employee safety", *Journal of Occupational Health Psychology*, Vol. 11 No. 1, pp. 76-86.
- Kerr, S. and Jermier, J.M. (1978), "Substitutes for leadership: their meaning and measurement", *Organizational Behavior and Human Performance*, Vol. 22 No. 3, pp. 375-403.
- Kim, W.G., McGinley, S., Choi, H.M. and Agmapisarn, C. (2019), "Hotels' environmental leadership and employees' organizational citizenship behavior", *International Journal of Hospitality Management*, Vol. 87, pp. 1-12.
- Kim, H., Park, J.H., Lee, S.K. and Jang, S. (2012), "Do expectations of future wealth increase outbound tourism? Evidence from Korea", *Tourism Management*, Vol. 33 No. 5, pp. 1141-1147.
- Kubickova, M., Kirimhan, D. and Li, H. (2019), "The impact of crises on hotel rooms' demand in developing economies: the case of terrorist attacks of 9/11 and the global financial crisis of 2008", *Journal of Hospitality and Tourism Management*, Vol. 38, pp. 27-38.
- Leischnig, A. and Kasper-Brauer, K. (2015), "Employee adaptive behavior in service enactments", *Journal of Business Research*, Vol. 68 No. 2, pp. 273-280.
- Li, W., Bhutto, T.A., Wang, X., Maitlo, Q., Zafar, A.U. and Bhutto, N.A. (2020), "Unlocking employees' green creativity: the effects of green transformational leadership, green intrinsic, and extrinsic motivation", *Journal of Cleaner Production*, Vol. 255 No. 10, pp. 1-10.

- Ling, Q., Lin, M. and Wu, X. (2016), "The trickle-down effect of servant leadership on frontline employee service behaviors and performance: a multilevel study of Chinese hotels", *Tourism Management*, Vol. 52, pp. 341-368.
- Liu-Lastres, B., Schroeder, A. and Pennington-Gray, L. (2019), "Cruise line customers' responses to risk and crisis communication messages: an application of the risk perception attitude framework", *Journal of Travel Research*, Vol. 58 No. 5, pp. 849-865.
- Lu, C.S. and Yang, C.S. (2010), "Safety leadership and safety behavior in container terminal operations", *Safety Science*, Vol. 48 No. 2, pp. 123-134.
- Lugosi, P. (2019), "Deviance, deviant behaviour and hospitality management: sources, forms and drivers", *Tourism Management*, Vol. 74, pp. 81-98.
- Ma, J., Zhou, X., Chen, R. and Dong, X. (2018), "Does ambidextrous leadership motivate work crafting", *International Journal of Hospitality Management*, Vol. 77, pp. 159-168.
- Martínez-Córcoles, M. and Stephanou, K. (2017), "Linking active transactional leadership and safety performance in military operations", *Safety Science*, Vol. 96, pp. 93-101.
- Mayer, D.M., Kuenzi, M., Greenbaum, R., Bardes, M. and Salvador, R. (2009), "How low does ethical leadership flow? Test of a trickle-down model", *Organizational Behavior and Human Decision Processes*, Vol. 108 No. 1, pp. 1-13.
- Neal, A., Griffin, M.A. and Hart, P.D. (2006), "A study of the lagged relationships among safety climate, safety motivation, safety behavior, and accidents at the individual and group levels", *Journal of Applied Psychology*, Vol. 91 No. 4, pp. 946-953.
- Neal, A.F. and Griffin, M.A. (2000), "The impact of organisational climate on safety climate and individual behaviour", *Safety Science*, Vol. 34 No. 1-3, pp. 99-109.
- Newaz, M.T., Davis, P., Jefferies, M. and Pillay, M. (2019), "The psychological contract: a missing link between safety climate and safety behaviour on construction sites", *Safety Science*, Vol. 112, pp. 9-17.
- Oah, S., Na, R. and Moon, K. (2018), "The influence of safety climate, safety leadership, workload, and accident experiences on risk perception: a study of Korean manufacturing workers", *Safety and Health at Work*, Vol. 9 No. 4, pp. 427-433.
- Pedrero, V. and Manzi, J. (2020), "Self-beliefs, engagement and motivation in science and mathematics: are they universal", *International Journal of Educational Research*, Vol. 101, pp. 1-11.
- Podsakoff, P.M. and MacKenzie, S.B. (1997), "Kerr and Jermier's substitutes for leadership model: background, empirical assessment, and suggestions for future research", *The Leadership Quarterly*, Vol. 8 No. 2, pp. 117-132.
- Podsakoff, P.M., MacKenzie, S.B., Lee, J.Y. and Podsakoff, N.P. (2003), "Common method biases in behavioral research: a critical review of the literature and recommended remedies", *Journal of Applied Psychology*, Vol. 88 No. 5, pp. 879-903.
- Reisinger, Y. (2005), "Travel anxiety and intentions to travel internationally: implications of travel risk perception", *Journal of Travel Research*, Vol. 43 No. 3, pp. 212-225.
- Rimal, R.N. and Real, K. (2003), "Perceived risk and efficacy beliefs as motivators of change: use of the risk perception attitude (RPA) framework to understand health behaviors", *Human Communication Research*, Vol. 29 No. 3, pp. 370-399.
- Scott, S.G. and Bruce, R.A. (1994), "Determinants of innovative behavior: a path model of individual innovation in the workplace", *Academy of Management Journal*, Vol. 37 No. 3, pp. 580-607.
- Smith, T.D., DeJoy, D.M., Dyal, M.A., Pu, Y. and Dickinson, S. (2019), "Multi-level safety climate associations with safety behaviors in the fire service", *Journal of Safety Research*, Vol. 69, pp. 53-60.
- Stiles, S., Ryan, B. and Golightly, D. (2018), "Evaluating attitudes to safety leadership within rail construction projects", *Safety Science*, Vol. 110, pp. 134-144.

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- Turner, M.M., Rimal, R.N., Morrison, D. and Kim, H. (2006), "The role of anxiety in seeking and retaining risk information: testing the risk perception attitude framework in two studies", *Human Communication Research*, Vol. 32 No. 2, pp. 130-156.
- Wang, X. (2014), "How do people participate in social network sites after crises? A self-determination perspective", *Social Science Computer Review*, Vol. 32 No. 5, pp. 662-677.
- Wang, C., Wang, J., Wang, X., Yu, H., Bai, L. and Sun, Q. (2019), "Exploring the impacts of factors contributing to unsafe behavior of coal miners", *Safety Science*, Vol. 115, pp. 339-348.
- Wen, Z. and Ye, B. (2014), "Different methods for testing moderated mediation models: competitors or backups", *Acta Psychologica Sinica*, Vol. 46 No. 5, pp. 714-726.
- Witte, K. (1996), "Predicting risk behaviors: development and validation of a diagnostic scale", *Journal of Health Communication*, Vol. 1 No. 4, pp. 317-342.
- Wood, R. and Bandura, A. (1989), "Social cognitive theory of organizational management", *Academy of Management Review*, Vol. 14 No. 3, pp. 361-384.
- World Health Organization (2020), "WHO coronavirus disease (COVID-19) dashboard", available at: <https://covid19.who.int/> (accessed 18 July 2020).
- Wu, T.C. (2005), "The validity and reliability of safety leadership scale in universities of Taiwan", *International Journal of Technology and Engineering Education*, Vol. 2 No. 1, pp. 27-42.
- Wu, T.C. (2008), "Safety leadership in the teaching laboratories of electrical and electronic engineering departments at Taiwanese universities", *Journal of Safety Research*, Vol. 39 No. 6, pp. 599-607.
- Xie, C., Huang, Q., Lin, Z. and Chen, Y. (2020), "Destination risk perception, image and satisfaction: the moderating effects of public opinion climate of risk", *Journal of Hospitality and Tourism Management*, Vol. 44, pp. 122-130.
- Xie, C., Zhang, J., Chen, Y., Morrison, A.M. and Lin, Z. (2020), "Measuring hotel employee perceived job risk: dimensions and scale development", *International Journal of Contemporary Hospitality Management*, Vol. 32 No. 2, pp. 730-748.
- Xue, Y., Fan, Y. and Xie, X. (2020), "Relation between senior managers' safety leadership and safety behavior in the Chinese petrochemical industry", *Journal of Loss Prevention in the Process Industries*, Vol. 65, pp. 1-15.
- Zenker, S. and Kock, F. (2020), "The coronavirus pandemic: a critical discussion of a tourism research agenda", *Tourism Management*, Vol. 81, pp. 1-4.
- Zhang, Y. and Chen, C.C. (2013), "Developmental leadership and organizational citizenship behavior: mediating effects of self-determination, supervisor identification, and organizational identification", *The Leadership Quarterly*, Vol. 24 No. 4, pp. 534-543.
- Zohar, D. (2002), "The effects of leadership dimensions, safety climate, and assigned priorities on minor injuries in work groups", *Journal of Organizational Behavior*, Vol. 23 No. 1, pp. 75-92.

Constructs	Items	Description
Safety coaching	SL01	Hotel leaders are setting an example for employees for preventing the spread of the COVID-19 pandemic
	SL02	Hotel leaders are conducting skills training about the COVID-19 pandemic
	SL03	Hotel leaders are helping employees to recognize the importance of COVID-19 prevention
	SL04	Hotel leaders are instructing and alleviating the task conflict among departments during COVID-19
Safety control	SL05	Hotel leaders are supporting the establishment of regulations of safety management related to COVID-19 prevention
	SL06	Hotel leaders are requesting staff to obey regulations of safety management related to COVID-19 prevention
	SL07	Hotel leaders are establishing a safety responsibility system during the COVID-19 pandemic
	SL08	Hotel leaders are auditing employee safety performance regularly during the COVID-19 pandemic
	SL09	Hotel leaders are firmly ordering staff to accomplish safety tasks related to COVID-19 prevention
Safety motivation	SL10	Hotel leaders are valuing safety incentives and safety rewards during the COVID-19 pandemic
	SL11	Hotel leaders are rewarding staff who participate in COVID-19 prevention
	SL12	Hotel leaders are encouraging staff members to provide safety suggestions
Safety care	SL13	Hotel leaders are praising staff outstanding performance in COVID-19 prevention
	SL14	Hotel leaders are concerned about staff's daily lives during the COVID-19 pandemic
	SL15	Hotel leaders are making an effort to meet staff resource needs for safety in COVID-19 prevention
	SL16	Hotel leaders are appeasing staff negative emotions during the COVID-19 pandemic
	SL17	Hotel leaders are showing consideration for staff physical and psychological safety during the COVID-19 pandemic
	SL18	Hotel leaders are making an effort to create a safe workplace during the COVID-19 pandemic
Safety compliance	SC01	I am using all the necessary safety equipment to do my job during the COVID-19 pandemic
	SC02	I am using the correct safety procedures for carrying out my job during the COVID-19 pandemic
	SC03	I am ensuring the highest levels of safety when I carry out my job during the COVID-19 pandemic
Safety participation	SP01	I am promoting pandemic prevention and safety programs within the organization during the COVID-19 crisis
	SP02	I am putting in extra effort to improve the safety of the hotel during the COVID-19 pandemic
	SP03	I am voluntarily carrying out tasks or activities that help to improve hotel safety during the COVID-19 pandemic

**Table A1.**  
Measurement items

*(continued)*



Constructs	Items	Description
Safety adaptation	SA01	I am generating creative ideas or suggestions on COVID-19 prevention for the hotel
	SA02	I am promoting and championing new methods to colleagues for preventing and controlling COVID-19
	SA03	I am searching out new technologies, processes, and techniques to improve the effectiveness of COVID-19 prevention in the hotel
Perceived susceptibility	RP01	I am at risk for contracting the COVID-19 infection when working in hotels
	RP02	It is likely that I will be contact with infected guests when working in hotels
	RP03	My chance of getting the COVID-19 infection when working in hotels is high
	RP04	It is dangerous to work in hotels during the COVID-19 pandemic
Perceived severity	RS01	COVID-19 is a serious disease that can kill
	RS02	COVID-19 is more deadly than most people realize
	RS03	If I were to get the COVID-19 infection, I would experience serious negative consequences
	RS04	If I were to get the COVID-19 infection, it would have a severe negative impact on my health
	RS05	If I were to get the COVID-19 infection, it would be harmful to my family
Belief restoration	BR01	I am confident that hotel will recover quickly from the COVID-19 pandemic
	BR02	The hotel has enough capacity to cope with the COVID-19 pandemic
	BR03	The hotel has sufficient resources to reduce the negative impacts of the COVID-19 pandemic
	BR04	The hotel has a strong risk-resistance ability

Table A1.

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