



**The effects of hotel employee ternary safety behavior on negative safety outcomes: The moderation of job vigor and emotional exhaustion**

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**Manuscript ID:** JSTP-01-2022-0023.R1

**Title: The effects of hotel employee ternary safety behavior on negative safety outcomes: The moderation of job vigor and emotional exhaustion**

At the outset, the authors would like to thank the Editor and all reviewers for accepting our paper and for their valuable comments. This work is positioned relative to previous research published in JSTP. Changes have been highlighted in yellow in the attached manuscript. The following chart summarizes the responses to the reviewers' comments; page and line numbers are included to indicate where changes were made.

**EDITOR**

Suggestions/comments from the reviewer	Response from the Authors
<p>1. Please also note that given the significant number of regular subscribers to the journal, the paper also needs to be positioned relative to prior research published in JSTP, so that their understanding of the contribution is enhanced. Should you choose not to revise and resubmit the manuscript, however, please do let me know.</p>	<p>According to your suggestion, prior research published in JSTP, had been cited and discussed in the paper, so as to enhance understanding of the contribution.</p> <p>For example:</p> <p>Gong, T. and Wang, C.Y. (2019). "How does dysfunctional customer behavior affect employee turnover", <i>Journal of Service Theory and Practice</i>, Vol. 29 No. 3, pp. 329-352.</p> <p>Quratulain, S., Ejaz, A. and Khan, A.K. (2021). "Do self-monitors experience less emotional exhaustion? Testing the role of supervisor-rated performance and perceived competitive climate", <i>Journal of Service Theory and Practice</i>, Vol. 31 No. 5, pp. 738-755.</p>

**REVIEWER 1**

Suggestions/comments from the reviewer	Responses from the Authors
<p>1. I think the authors have tried to address the points raised by the reviewers and have done a good job at improving various sections of the paper. However, there needs to be strengthening of the implications in relation to services industry, both in relation to theory</p>	<p>Thank you for your acknowledgement of our revision.</p> <p>The authors believe that the findings can be applied in other settings beyond tourism. Hospitality companies provide a comprehensive range of products and services (e.g., catering, entertainment, and accommodation) for many types of guests. This research revealed the effect of employee ternary safety behaviors on negative safety</p>

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4 and practice. Can findings be  
5 applied in other settings beyond  
6 tourism for instance?  
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outcomes in service enterprises. According to your  
10 suggestions, the authors made revisions in the theoretical  
11 and practical implications section, highlighting the  
12 implications of this research for service industries in  
13 general. The revisions were as follows:

In the theoretical implications section (page 27-28):

14  
15 “First, based on social learning theory and the ternary  
16 model of safety behavior, this research revealed the social  
17 learning mechanisms for employee safety behavior in  
18 services, which enriches the research literature on  
19 employee safety behavior and the outcomes. Although  
20 the impact of employee safety behavior on negative  
21 safety outcomes have been confirmed, the focus is on  
22 traditional high-risk occupations and service industries  
23 lack investigation (Christian et al., 2009; Neal and  
24 Griffin, 2006). Moreover, the extant research fails to  
25 reveal the self-reinforcement and multiple mediation  
26 effects of safety behavior on negative safety outcomes. In  
27 expanding the research, this study examined the impact  
28 of employee ternary safety behavior on negative safety  
29 outcomes in comprehensive service contexts such as  
30 hotels and confirmed the multiple mediation effects of  
31 safety behavior and safety outcome performance based  
32 on social learning theory. These conclusions provide a  
33 theoretical basis for service enterprises to intervene and  
34 promote employee safety behavior. Therefore, the  
35 theoretical contribution of this research is to extend the  
36 investigation of the effect of employee safety behavior  
37 from traditional high-risk industries to service industries,  
38 which clarifies the social learning process of employee  
39 safety behavior in services. Moreover, this research  
40 extends the application of social learning theory in the  
41 occupational safety field, particularly in service  
42 occupational safety.  
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46 Second, based on conservation of resources theory, this  
47 research investigated the moderation effects of job vigor  
48 and emotional exhaustion on employee ternary safety  
49 behavior-negative safety outcomes, which highlighted the  
50 supporting role of employee resource conservation in  
51 services for adopting safety behavior and reducing  
52 negative safety outcomes. Compared with traditional  
53 high-risk industries, employees of service enterprises are  
54 involved in high-intensity physical, intellectual, and  
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emotional labor (Chen et al., 2019), which requires them to have sufficient resources to quickly respond to internal and external service demands. Accordingly, it is necessary to investigate boundary conditions on the impact of employee safety behavior based on a resource conservation perspective in services. However, current relevant research is limited to traditional high-risk industries such as oil, chemicals, and construction (Li et al., 2010; Xia et al., 2018; Tong et al., 2020). Job vigor and emotional exhaustion are physiological states and emotional experiences commonly found with employees in service process, and are important indicators for assessing their resource stocks and energy (Karatepe et al., 2010; Chen et al., 2019). Based on conservation of resources theory, this research initially regarded job vigor and emotional exhaustion as positive and negative resources respectively possessed by an employee and confirmed their positive and negative moderation roles for the relationship between safety behavior and negative safety outcomes combining the resource value-added and loss spiral effects. Thus, this research extends the investigation of the boundary conditions in the influence of employee safety behavior from a resource conservation perspective. This represents an extension of safety behavior research and provides a theoretical basis for evaluating the effectiveness of employee safety behavior in the service industries. The theoretical contribution of this research is in identifying new moderation variables for the effect of employee safety behavior in services, as well as providing valuable insights for investigating future safety behavior and outcomes.”

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In the practical implications section (page 28-30):

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“First, managers of service enterprises should establish employee safety behavior systems and develop tailored strategies for managing safety based upon different dimensions. Regarding safety compliance, managers should develop a clear safety management system and safety program and combine safety responsibilities with the safety requirements for each position. Managers should implement safety training and education to address potential conflicts in service provision, emphasizing that personalized service is also based on compliance with safety requirements. Regarding safety

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4 participation, managers should establish safety behavior  
5 incentive plans, and cultivate enthusiasm for engaging in  
6 safety activities. Managers should reward and commend  
7 employees for proactive behaviors that are conducive to  
8 workplace safety, such as helping colleagues solve safety  
9 issues, attending safety training and meetings, and  
10 learning safety knowledge. Regarding safety adaptation,  
11 managers should appropriately empower employees,  
12 encourage them to solve problems through innovative  
13 methods and develop a creative atmosphere that supports  
14 safety. In addition, managers should confer the honor of  
15 “outstanding employees” on those who creatively solve  
16 safety issues, thereby providing role models for others to  
17 learn about safety adaptation.  
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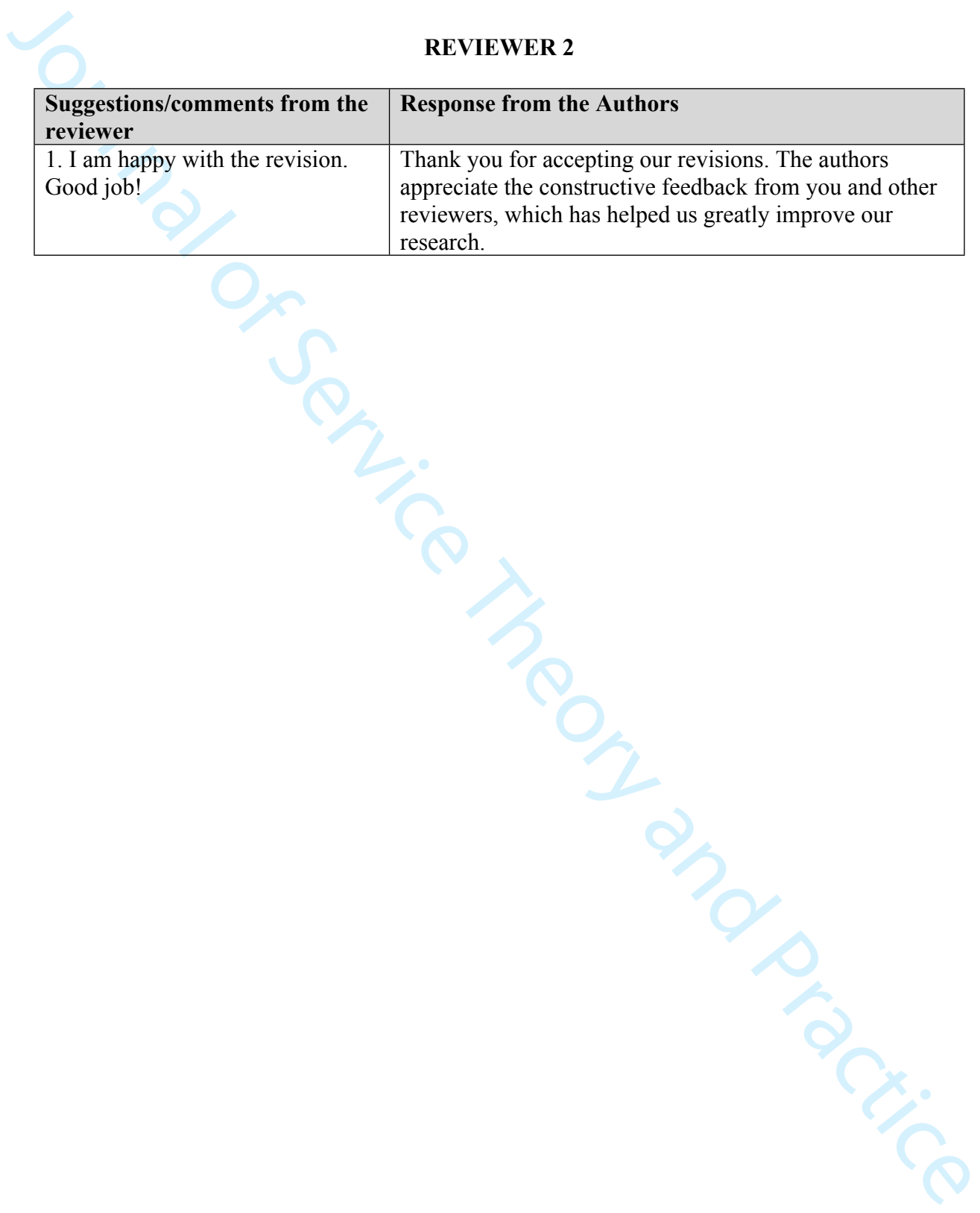
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21 Second, managers of service enterprises should motivate  
22 job vigor, relieve emotional exhaustion, and provide  
23 resource support for employees to adopt safety behavior  
24 and reduce service accidents. Regarding job vigor,  
25 managers should frequently evaluate job vigor as an  
26 assessment criterion during the hiring process and for  
27 subsequent job promotions. Moreover, managers should  
28 create a relaxed and worry-free work environment so that  
29 employees retain their passion and energy. Managers  
30 should provide support and assistance to employees who  
31 suffer negative safety outcomes such as service failures  
32 and security accidents, and help employees to collectively  
33 deal with potential risk in service provision. For less  
34 emotional exhaustion, managers should pay attention and  
35 track the changes in employee emotional status and  
36 provide positive feedback on employee negative  
37 emotions and experiences. Managers should also  
38 establish “care plans” and allow employees who have  
39 already had symptoms of emotional exhaustion to take a  
40 temporary rest, so as not to become more exhausted. In  
41 addition, managers should redesign job responsibilities  
42 and tasks according to employee resource stocks. For  
43 example, managers should assign employees with high  
44 vigor to positions with high physical and emotional labor  
45 and frequent safety behaviors, and provide them with  
46 greater support, thereby reducing negative safety  
47 outcomes and improving service and safety  
48 performance.”  
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REVIEWER 2

Suggestions/comments from the reviewer	Response from the Authors
1. I am happy with the revision. Good job!	Thank you for accepting our revisions. The authors appreciate the constructive feedback from you and other reviewers, which has helped us greatly improve our research.



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4 **The effects of hotel employee ternary safety behavior on negative safety outcomes: The**  
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6 **moderation of job vigor and emotional exhaustion**  
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8  
9 **Abstract**

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11 **Purpose-** The effect of hotel employee safety behavior has not as yet been investigated. The  
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13 purpose of this research is to determine the impact of hotel employee ternary safety behavior  
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15 on negative safety outcomes, as well as the moderation effects of job vigor and emotional  
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17 exhaustion.  
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22 **Design/methodology/approach-** A questionnaire survey of 16 medium- and high-star-rated  
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24 hotels in southeast China was conducted and 571 responses were received for model  
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26 estimation. The statistical analysis techniques adopted were confirmatory factor analysis,  
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28 correlation analysis, hierarchical regression, and structural equation modeling.  
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32 **Findings-** The results showed that: (1) safety compliance and participation positively  
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34 predicted safety adaptation; (2) the three dimensions of safety behavior contributed to  
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36 reducing negative safety outcomes, and there was a multiple mediation process in their  
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38 relationship; (3) job vigor positively moderated the influence of safety compliance and  
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40 adaption on negative safety outcomes, and emotional exhaustion negatively moderated the  
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42 influence of safety participation on negative safety outcomes.  
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48 **Originality/value-** This research provides greater insights into the relationship between  
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50 safety behavior and outcome performance within the hotel industry and yields theoretical and  
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52 practical implications for improving employee safety behavior and hotel safety performance.  
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56 **Keywords:** ternary structural model; safety adaptation; negative safety outcomes; job vigor;  
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58 emotional exhaustion  
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## 1. Introduction

Hospitality companies provide a comprehensive range of products and services (e.g., catering, entertainment, and accommodation) for many types of guests (Zhang et al., 2020). Among these safety is a basic requirement and a fundamental premise for customer enjoyment of service experiences (Chen and Chen, 2014; Kim et al., 2021; Zhang et al., 2021). Hotel staff members ensure safety by adhering to safety systems and standard operating procedures, performing security responsibilities, and developing a climate of safety (Hu et al., 2021; Kim et al., 2021; Zhang et al., 2020). Nevertheless, employee misbehavior and behaviors with unsafe outcomes, including deviance, rule-breaking, counterproductive behavior, and service sabotage, occur every day in hotels (Ghosh and Shum, 2019; Harris and Ogbonna, 2002; Lugosi, 2019). Accidents and service failures caused by the unsafe behavior of employees are becoming more frequent in hotels, and this is harming the hotel's safety image and customer trust. Thus, hotel staff safety behavior can better assure workplace, physical, and property safety of employees and customers and support organizational safety performance, particularly in crises. For example, the COVID-19 pandemic required hotels and employees to adopt higher-level safety service strategies and safety operational standards to reduce infection risk and ensure safety (Zhang et al., 2020). It is therefore of great significance to establish corporate safety behavior systems and promote employee safety behavior to improve service quality and the safe development in hotel companies.

Safety behavior research originated from Heinrich's (1931) accident causation theory, which proposed that unsafe behaviors of individuals are the direct causes of accidents. Safety behavior refers to employee responses to safety issues and threats in the workplace, aiming to



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4 reduce conflicts, injuries, failures, and accidents as well as facilitating normal work activities  
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6 (Neal and Griffin, 2000; Zhang et al., 2021). Employee safety behavior is a very widely  
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8 researched topic, and the extant literature mainly focuses on traditional high-risk industries  
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10 such as construction, firefighting, and coal mining (Newaz et al., 2019; Smith et al., 2019;  
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12 Wang et al., 2019), as well as in service sectors such as medical, health care, airline, food  
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14 processing, and retail services (Baser et al., 2017; Chen and Chen, 2014; Christian et al.,  
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16 2009; Lee et al., 2019; Neal and Griffin, 2000). Since hospitality has gradually been  
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18 recognized as a high-risk and high occupation disease industry (Xie et al. 2020), hotel  
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20 employee safety behavior has attracted greater attention. Hotel employees are facing  
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22 traditional risks and challenges from human (e.g., customer misconduct), equipment (e.g.,  
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24 failure of facilities), internal and external environmental (e.g., crime and violence), and  
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26 management factors (e.g., lack of safety training) (Gong and Wang, 2019; Xie et al. 2020), as  
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28 well as encountering new and emerging risks such as intelligent service options, customer  
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30 personalized needs, and privacy leakages. Thus, hotel employees must maintain workplace  
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32 safety by complying with safety regulations, and also by improving workplace safety climate  
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34 through extra-role safety behaviors such as participating in safety training and helping  
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36 colleagues with safety issues and even needing to be increasingly adaptable, versatile, and  
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38 creative in solving threats and issues, including learning new skills, solving problems  
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40 creatively, demonstrating interpersonal and physical oriented adaptability, to improve hotel  
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42 service quality and safety performance (Zhang et al., 2020; 2021). Currently, employee safety  
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44 behavior is considered to be a direct factor in reducing workplace accidents, service failure,  
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46 and employee injuries, as well as mediating the impacts of safety motivation, safety  
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4 knowledge, and safety climate on organizational safety performance and employee safety  
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6 outcomes (Christian et al., 2009). In particular, the current COVID-19 pandemic has placed  
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8 hospitality businesses in an extremely challenging situation in which employee safety  
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10 behaviors have become a top priority for operations (Kim et al., 2021; Zhang et al., 2021).  
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12 Safety behaviors are now a decisive factor and employees must avoid accidents, maintain  
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14 workplace safety, and promote safety performance.  
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21 In addition, two key literature gaps can be identified within this field. First, limited  
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23 research has investigated the underlying mediation of safety behavior affecting negative  
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25 safety outcomes from the behavioral learning perspective. Although academics have widely  
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27 believed that employee safety behavior effectively contributes to reducing workplace  
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29 negative safety outcomes such as accidents and injuries (Christian et al., 2009; Neal and  
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31 Griffin, 2006), few research studies have examined the mediation effect of employee safety  
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33 behavior on negative safety outcomes. The ternary safety behavior model proposed by Zhang  
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35 et al. (2020) argued that hotel employee responses to safety issues have three dimensions  
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37 with different complex and creative levels. The basic safety behavior dimension (e.g., safety  
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39 compliance) can be transformed and learned to a more complex and creative safety behavior  
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41 dimension (e.g., safety participation, safety adaptation) through direct experience and  
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43 observing role models (Zhang et al., 2021). However, few previous studies consider the  
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45 process of learning, reinforcing, and mediating among these three dimensions (compliance,  
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47 participation, and adaptation) when employee safety behavior reduces workplace accidents  
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49 and injuries. Second, the boundary conditions and synergistic factors for hotel employee  
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51 safety behavior on negative safety outcomes from a resource conservation perspective lack  
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empirical investigation. Currently, several factors, such as safety climate, work experience of supervisors, exhaustion, cynicism, and low professional efficacy, have been identified as important boundary conditions and moderation variables, particularly in traditional high-risk industries such as oil, chemicals, and construction (Li et al., 2010; Tong et al., 2020; Xia et al., 2018). Safety behaviors require employees to invest a great deal of time and energy to maintain workplace safety and may erode their resources (Guo et al., 2019; Zhang et al., 2021). Also, employees need to have sufficient resource reserves to deal with highly intensive physical, intellectual, and emotional labor to improve service quality (Chen et al., 2019). It is, therefore, necessary to investigate the boundary conditions of employee safety behavior affecting negative safety outcomes in the hotel context from the resource conservation perspective. Moreover, hotel employees should be highly motivated and emotional in customer service interactions (Karatepe et al., 2010; Chen et al., 2019), and job vigor and emotional exhaustion represent the positive job engagement states and negative emotional experiences they commonly possess, respectively. These two factors reflect the positive and negative resources of employees and may impact their decision-making and job performance (Zhang et al., 2020; Choi et al., 2014; Karatepe et al., 2019). However, their moderation roles concerning safety behavior and outcomes have not been investigated from a resource conservation perspective.

To address the above-mentioned gaps, this research investigated the impact of hotel employee ternary safety behavior on negative safety outcomes, as well as the moderation effects of job vigor and emotional exhaustion. This research attempted to make two contributions. First, based on social learning theory, it determined the relationships among

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4 safety dimensions (compliance, participation, and adaptation) and negative safety outcomes,  
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6 revealing the process of social learning and internal self-reinforcement of hotel employee  
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8 safety behavior, as well as providing empirical support and a theoretical basis for analyzing  
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10 the multiple mediation effects of safety behavior and safety outcome performance. Second,  
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12 drawing on the resource conservation perspective, this research examined the moderation  
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14 effects of job vigor and emotional exhaustion between safety behavior-outcomes links,  
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16 highlighted the supporting role of resource conservation demand in the impact process of  
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18 hotel employee safety behavior, as well as extending employee safety behavior research from  
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20 the resource conservation perspective. This research provided new insights as well as a  
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22 theoretical basis for service companies such as hotels in establishing safety behavior systems,  
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24 reducing workplace accidents and service failures, and promoting corporate safety  
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26 performance.  
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## 35 **2. Literature review and hypothesis development**

### 36 ***2.1. Safety performance***

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42 Safety performance originated from the concept of work performance and can be  
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44 defined as “actions or behaviors that individuals exhibit in almost all jobs to promote the  
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46 health and safety of workers, clients, the public and the environment” (Burke et al., 2002, p.  
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48 432). Safety performance also describes the overall effect of employees and organizations in  
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50 the execution of safety goals and safety operations, which is a direct response to the results of  
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52 enterprise safety production (Christian et al., 2009). Since traditional high-risk industries such  
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54 as coal, construction, engineering, and oil, have high-risk factors, high accident rates, and  
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4 serious occupational diseases, improving safety performance and reducing work-related  
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6 accidents have always been important tasks for these companies (Newaz et al., 2019; Smith et  
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8 al., 2019; Tong et al., 2020). In the risk society context, the business environment has become  
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10 increasingly unpredictable and risky, reducing employee unsafe behavior and improving  
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12 safety performance have also become important issues for service companies such as  
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14 medical, aviation, catering, and hotels (Chen and Chen, 2014; Neal and Griffin, 2000; Zhang  
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16 et al., 2021).  
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23 Safety performance is sometimes either referred to as a measure of employee and  
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25 organizational safety outcomes or as a measure of employees' safety behavior (Guo et al.,  
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27 2019; Christian et al., 2009). Regarding safety performance at the outcome level, it can be  
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29 assessed and measured by quantifiable accidents and outcomes, such as annual accidents, the  
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31 number of injuries or deaths, and occupational diseases (Guo et al., 2019; Zohar, 2000). For  
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33 safety performance at the behavioral level, based on a two-factor performance model (task  
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35 and contextual performance), Griffin and Neal (2000) proposed that it can be defined and  
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37 measured from two dimensions - compliance and participation. Safety compliance refers to  
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39 the core activities that staff need to perform to maintain workplace safety. Safety  
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41 participation is proactive behavior that contributes to developing an environment that  
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43 supports safety (Neal et al., 2000; Neal and Griffin, 2006). With rapid economic and  
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45 technological progress, today's organizations are facing novel societal and industry  
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47 environments. This also requires employees to adapt to the new circumstances and take  
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49 positive actions to cope with uncertain and unpredictable environments (Griffin and Hesketh,  
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51 2011; Pulakos et al., 2000). Thus, based on the adaptive performance dimension, a genuine  
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4 addition to the two-factor performance model, Zhang et al. (2020) proposed the ternary  
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6 structural model of safety behavior composing compliance, participation, and adaptation in  
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8 hospitality.  
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12 The influencing factors and formation mechanisms of safety performance have been  
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14 widely investigated. The antecedents of safety performance can be grouped into  
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16 organizational (e.g., safety climate, organizational climate, leadership); individual (e.g.,  
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18 safety motivation, safety knowledge, personality); work characteristics (e.g., job demand, job  
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20 resource); and situational factors (e.g., workplace thermal conditions) (Chen and Chen, 2014;  
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22 Clarke, 2006; Griffin and Neal, 2000; Ji et al., 2019; Li et al., 2010; Neal et al., 2000;  
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24 Ramsey et al., 1983). Based on a meta-analysis of workplace safety literature, Christian et al.  
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26 (2019) established a conceptual model of safety performance from person- and  
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28 situation-based perspectives, in which safety climate, leadership, employee personality  
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30 characteristics, and job attitude were identified as the leading influential factors, which  
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32 affected safety behavior performance and safety outcomes through the mediation of  
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34 employee safety motivation and safety knowledge. In hospitality, the influential factors, such  
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36 as safety climate, safety leadership, corporate social responsibility, safety knowledge, safety  
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38 motivation, prevention work focus, safety attitudes, and safety norms, on employee safety  
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40 behavior have also been confirmed (Baser et al., 2017; Avci & Yayli, 2014; Kim et al., 2021;  
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42 Zhang et al., 2020; Zhang et al., 2021). However, compared with the antecedents, few  
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44 research studies empirically explored the outcomes of safety performance. Although some  
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46 research studies examined employee safety behavior and negative safety outcomes (e.g.,  
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48 accidents, injuries) (Clarke, 2006; Oliver et al., 2011), the mediation and boundary conditions  
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of employee safety behavior affecting negative safety outcomes are unclear and require more investigation. Therefore, this research examined the relationship between hotel employee ternary safety behavior and negative safety outcomes.

## ***2.2. Social learning theory and safety performance model***

Social learning theory, proposed by Bandura (1997), reveals the pattern, process, and mechanism of individual learning and acquiring of behaviors. People can learn through direct experiences, as well as by mimicking the role models to acquire behavioral patterns (Bandura, 1997). Thus, individual behavior, particularly complex behavior, can be learned and obtained through direct experience and observing role models. Previous research has confirmed that employee safety behavior can be learned and acquired through direct experience and observing role models. Specifically, leaders are role models in organizations, and safety-oriented leadership and practice (safety leadership) strengthen employee safety behaviors (Lu and Yang, 2010). Moreover, the complex safety behaviors of employees (e.g., safety adaptation) can be learned and transformed into basic safety behaviors (e.g., safety compliance) through direct experience and observing role models (Zhang et al., 2021).

According to social learning theory, there is a process of self-regulation and internal reinforcement in the social learning of complex behaviors, that is, the process of adjusting one's behavior by comparing and assessing one's expectations and the actual outcomes of the behavior (Bandura, 1997). In addition, the social learning of individual complex behavior is affected by internal factors such as self-efficacy and expectations. Self-regulation is an individual's rational cognitive ability in the process of behavioral learning and acquisition. In

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4 the social learning of complex behavior, individuals may continuously adjust behavioral  
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6 response patterns according to actual behavioral outcomes, and achieve expected outcomes  
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8 through the intervention of individual internal factors (Bandura, 1997). Accordingly, in the  
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10 social learning of safety behavior (particularly for safety adaptation), employees adjust  
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12 behavioral response patterns according to the safety outcomes achieved, and employee  
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14 internal factors serve as important boundary conditions and moderate in this process, thereby  
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16 improving safety performance (Tong et al., 2020; Zhang et al., 2021). Therefore, in this  
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18 research, employee safety compliance, participation, and adaptation were the dimensions of  
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20 safety behavior with varying complexity and creativity, the reduction of negative safety  
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22 outcomes served as the expected outcome, and job vigor and emotional exhaustion reflected  
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24 the internal factors and moderation variables, in investigating the effects on hotel employee  
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26 safety behavior. This research introduced the application of social learning theory in hotel  
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28 occupational safety and provides a theoretical basis for analyzing the impact of hotel  
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30 employee safety behavior on negative safety outcomes.  
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### 41 ***2.3. The relationships among safety behavior dimensions***

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44 According to social learning theory, individuals' complex behavior, such as safety  
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46 behavior, can be learned and obtained through direct experience and observing role models  
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48 (Bandura, 1997), thereby realizing the transformation from basic behaviors patterns to  
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50 complex behaviors. Previous research confirms that basic behavioral performance affects  
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52 higher-level behavioral performance (Zhang et al., 2021). For example, Mackenzie et al.  
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54 (1998) confirmed that employee in-role behavioral performance positively affected extra-role  
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56 behavioral performance. Chen and Chen (2014) investigated the impact of employees' in-role  
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4 safety behavior on extra-role safety behavior and upward safety communication.  
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7 In terms of the ternary structural model of safety behavior, compliance, participation,  
8 and adaptation are the three dimensions with different complex and creative levels (Neal et  
9 al., 2000; Zhang et al., 2020). Safety compliance is the simplest and fundamental dimension  
10 of safety behavior, which describes compliance behavior to the institutional safety norms,  
11 position responsibilities, and specific task requirements. It represents the required and basic  
12 safety activities that employees need to carry out to maintain workplace safety (Griffin and  
13 Neal, 2000; Guo et al., 2019). Safety participation is the second level of safety behaviors with  
14 employees who voluntarily participate in safety activities beyond their formal roles. These  
15 behaviors might not promote workplace safety directly, but they do contribute to developing  
16 an environment that supports safety (Griffin and Neal, 2000). Safety adaptation, such as  
17 learning new skills, solving problems creatively, demonstrating interpersonal and physical  
18 oriented adaptability, is characterized by initiative, innovation, and adaptability, which is a  
19 dimension of safety behavior with a highly complex and creative level (Zhang et al., 2020).  
20 Drawing from social learning theory, safety participation can be learned and acquired from  
21 safety compliance through direct experience and modeling, and safety adaptation can be  
22 learned and acquired from safety compliance and safety participation through direct  
23 experience and modeling as well. Previous research has demonstrated significant positive  
24 correlations and causal relationships between safety behavior dimensions (Chen and Chen,  
25 2014; Griffin and Neal, 2000; Zhang et al., 2021). Based on the foregoing, this research  
26 proposes:

- 27 • Hypothesis 1a: Employees' safety compliance has a positive impact on their safety

1  
2  
3  
4 participation.

- 5  
6  
7 • Hypothesis 1b: Employees' safety compliance has a positive impact on their safety  
8  
9 adaptation.

- 10  
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12  
13 • Hypothesis 1c: Employees' safety participation has a positive impact on their safety  
14  
15 adaptation.  
16  
17

#### 18 19 ***2.4. The impact of safety behavior on negative safety outcomes***

20  
21  
22 Negative safety outcomes are accidents, injuries, and safety threats suffered by  
23  
24 employees during risk prevention, safety-related task execution, and safety-related goal  
25  
26 development. According to Heinrich's (1931) accident causation model, accidents are  
27  
28 low-frequency and are mainly caused or prevented by individual safety-related behaviors.  
29  
30 Thus, employee safety behavior can reduce workplace negative safety outcomes, such as  
31  
32 accidents, injuries. Specifically, safety compliance reduces accidents caused by employees'  
33  
34 unsafe actions or violations of safety regulations (Li et al., 2010). Safety participation  
35  
36 involves more voluntary elements, which are likely to not only promote personal safety  
37  
38 consciousness and solve potential risks in advance but also ensure the safety of colleagues  
39  
40 and entire workplaces (Griffin and Neal, 2000; Clarke, 2006). In addition, safety adaptation  
41  
42 may not only reduce accidents and negative outcomes encountered, but also enable  
43  
44 employees and organizations to maintain strong adaptability in constantly changing external  
45  
46 environments. Moreover, previous research confirmed that employee safety behavior  
47  
48 negatively predicted negative safety outcomes such as accidents, injuries, and occupational  
49  
50 diseases (Clarke, 2006; Christian et al., 2009). Based on the foregoing, it is proposed that:  
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- Hypothesis 2a: Employees' safety compliance has a negative impact on negative safety outcomes.
- Hypothesis 2b: Employees' safety participation has a negative impact on negative safety outcomes.
- Hypothesis 2c: Employees' safety adaptation has a negative impact on negative safety outcomes.

### ***2.5. Mediation effect of safety adaptation***

Based on social learning theory, there is a process of self-regulation in the social learning of safety behaviors (Bandura, 1997; Zhang et al., 2021). Generally, self-regulation includes three stages: self-observation, self-judgment, and self-reaction. It starts from people's evaluation of their behavior according to various standards, then proceeds to the judgment of expected versus actual outcomes, and finally to the reaction to satisfaction, affirmation, and criticism of behavior. Employees constantly adjust their safety behavior by comparing and assessing expected safety outcomes and the actual outcomes in the process of social learning, to achieve expected safety outcomes. Thus, there is a complex self-regulation and mediation process between employee safety behaviors and negative safety outcomes.

In the social learning process of safety behavior, employees first engage in safety compliance according to organizational rules and regulations and then compare the behavioral outcomes achieved with the outcomes their organizations expected. Then they adjust their safety compliance in transitioning to safety participation and adaptation, to achieve the performances their organizations expected. Thus, safety participation and

1  
2  
3  
4 adaptation play a supporting role in the impacts of safety compliance on safety outcomes, that  
5  
6 is, they mediate the behavioral responses between safety compliance and negative safety  
7  
8 outcomes. In addition, safety participation, which reflects employees' active involvement and  
9  
10 commitment to safety, will be adjusted based on the behavioral outcomes to achieve the  
11  
12 expected performance. Thus, safety adaptation plays a mediating role in the relationship  
13  
14 between safety participation and outcomes. Zhang et al. (2021) confirmed that safety  
15  
16 participation mediated the impact of safety compliance on adaptation. Based on the  
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foregoing, it is proposed that:

- Hypothesis 3a: Safety adaptation mediates the negative impact of safety compliance on negative safety outcomes.
- Hypothesis 3b: Safety adaptation mediates the negative impact of safety participation on negative safety outcomes.

## 2.6. Moderation effects of job vigor

Job vigor is a positive, fulfilling, and persistent affective-cognitive state, and is characterized by high levels of energy and mental resilience while working, the willingness to invest effort into one's work, and persistence even in the face of difficulties (Schaufeli et al., 2002). As a core component of job engagement, job vigor represents employees' physical energy and mental resilience in the workplace, which is manifested by actively participating in work tasks, being sensitive and enthusiastic, and having the ability to empathize with others as well as establishing good personal relationships (Kahn, 1990; Shirom, 2003; Schaufeli et al., 2002; Teng et al., 2022). Since service provision involves intense physical,

1  
2  
3  
4 intellectual, and emotional labor (Chen et al., 2019), job vigor is needed in daily work.  
5

6 Therefore, it is advisable to pay attention to the potential role of job vigor in investigating the  
7  
8  
9 impact of safety behavior on negative safety outcomes in the hospitality industry.  
10

11  
12 According to the conservation of resources theory, individuals endeavor to obtain,  
13  
14 protect, and construct valuable resources, which are categorized as the object (e.g., car,  
15  
16 house), energy (e.g., technical ability, energy), conditional (e.g., friends, power), and personal  
17  
18 characteristic resources (e.g., self-efficacy, self-esteem) (Hobfoll, 1989). And the  
19  
20 conservation of resources theory proposed two spiral effects for resource conservation – the  
21  
22 value-added spiral and loss spiral effects (Hobfoll, 1989). The resource value-added spiral  
23  
24 effect is that individuals with more resources tend to have easier access to resources, and are  
25  
26 less susceptible to resource loss, thereby generating greater resource increments. Job vigor  
27  
28 involves a fulfilling and positive work state, which makes employees less fatigued and full of  
29  
30 energy and passion, thus contributing to work performance. Thus, combined with  
31  
32 conservation of resources theory, job vigor is associated with the positive resource possessed  
33  
34 by employees, which are reflected by positive emotional experiences, highly-motivated  
35  
36 physical state, and great personal relationships in their work setting (Schaufeli, 2012; Shirom,  
37  
38 2003; Schaufeli et al., 2002). According to the resource value-added spiral effect, employees  
39  
40 with high vigor tend to have sufficient resources as well as having easier access to other  
41  
42 factors (e.g., conditional and energy resources) and have a stronger resistance to the threat of  
43  
44 resource loss caused by having resource depletion behaviors (e.g., safety behavior) or  
45  
46 suffering negative safety conflicts (e.g., accidents and injuries), thereby supporting the impact  
47  
48 of safety behavior on negative outcomes. Compared with employees with low vigor, the  
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4 safety behavior of high-vigor employees tends to have more positive safety outcomes. Based  
5  
6 on the foregoing, it was proposed that:

- 7  
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9  
10 • Hypothesis 4a: Employee job vigor positively moderates the relationship between  
11 safety compliance and negative safety outcomes.
- 12  
13  
14  
15 • Hypothesis 4b: Employee job vigor positively moderates the relationship between  
16 safety participation and negative safety outcomes.
- 17  
18  
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21 • Hypothesis 4c: Employee job vigor positively moderates the relationship between  
22 safety adaptation and negative safety outcomes.
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## 27 28 **2.7. Moderation effects of emotional exhaustion**

29  
30 Emotional exhaustion represents an organization's excessive emotional demands on  
31 individuals during interpersonal interactions, which employees are unable to manage, leading  
32 to the exhaustion of emotional resources (Chang, 2009; Maslach and Jackson, 1981). As a  
33 core feature of burnout, emotional exhaustion is a state of physical and psychological  
34 depletion in the workplace and has a strong association with negative job-related outcomes  
35 (Maslach and Jackson, 1981). Emotional exhaustion is a negative response of employees to  
36 workplace stressors, as well as a fatigued state commonly possessed by employees,  
37 particularly in highly intensive, high emotional labor, and high-risk workplaces such as hotels  
38 (Choi et al., 2014). Therefore, the effect of hotel employee ternary safety behavior can be  
39 better determined and predicted after including it as a boundary condition and moderation  
40 variable.  
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The resource loss spiral effect affects individuals with lesser resources who tend to have

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4 weaker abilities to obtain resources, and are more susceptible to resource loss, thereby  
5  
6 accelerating this loss (Hobfoll, 1989). Emotional exhaustion, as a typical symptom of  
7  
8 overwork, can lead to the loss of energy, emotional and psychological resources, which is not  
9  
10 conducive to work performance (Welsh et al., 2019; Aryee et al., 2008; Choi et al., 2014).  
11  
12 Employees who are emotionally exhausted often experience negative emotions such as  
13  
14 anxiety, tension, depression, and lack of commitment to work due to physical and mental  
15  
16 fatigue. Thus, combined with conservation of resources theory, emotional exhaustion is a  
17  
18 negative resource possessed by hotel employees, which is reflected by a lack of energy at  
19  
20 work and feelings that emotional and physical resources have disappeared or have been  
21  
22 depleted (Chang, 2009; Kim et al., 2012; Maslach and Jackson, 1981; Quratulain et al.,  
23  
24 2021). According to the resource loss spiral effect, employees with high emotional  
25  
26 exhaustion tend to have fewer resources as well as having a weaker ability to obtain resources  
27  
28 (e.g., conditional and energy resources) and more easily lose resources when coping with  
29  
30 service demands, adopting resource depletion behaviors (e.g., safety behavior) or reducing  
31  
32 negative safety outcomes. Thus, to avoid falling into resource loss spiral, compared with  
33  
34 employees with low emotional exhaustion, the safety behavior of high emotional exhaustion  
35  
36 employees tends to have more negative safety outcomes. Based on the foregoing, it was  
37  
38 proposed that:  
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- 51 • Hypothesis 5a: Employee emotional exhaustion negatively moderates the relationship  
52 between safety compliance and negative safety outcomes.  
53
- 54 • Hypothesis 5b: Employee emotional exhaustion negatively moderates the relationship  
55 between safety participation and negative safety outcomes.  
56  
57  
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- Hypothesis 5c: Employee emotional exhaustion negatively moderates the relationship between safety adaptation and negative safety outcomes.

The conceptual model for this research is presented in Figure 1.

[Insert Figure 1 here]

### 3. Methodology

#### 3.1. Questionnaire design

The questionnaire was comprised of two sections. This first section was composed of the four scales for safety behavior, negative safety outcomes, job vigor, and emotional exhaustion. The safety behavior scale included 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. Four items based on Zhang et al. (2020) research were used to measure safety adaptation. Three items related to the self-reporting of accidents and injuries based on Huang et al. (2006) and Clark's (2006) research were adapted to measure negative safety outcomes. Six items for measuring job vigor are derived from the work engagement scale (UWES) developed by Schaufeli et al. (2002). The measurement of emotional exhaustion was based on the original scale developed by Maslach and Jackson (1981) and its Chinese version proposed by Li and Shi (2003), and five items were adapted to measure emotional exhaustion.

All constructs were measured by previously validated scales, and some items were slightly revised according to the cultural background and hospitality context. Based on the



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4 back translation method (Brislin, 1970), the English scales were translated into Chinese and  
5  
6 then were translated back to ensure content validity. Each item was rated on a seven-point  
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8 Likert scale from 'strongly disagree (1)' to 'strongly agree (7)'. The demographic  
9  
10 characteristics of employees were also collected, including gender, marital status, age,  
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12 education, monthly income, position, department, and work experience in hospitality.  
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### 16 17 **3.2. Data collection**

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19  
20 To ensure the reliability of each scale, a pilot survey was conducted in medium and high  
21  
22 star-rated hotels in Quanzhou and Xiamen (Fujian Province), and 249 valid responses were  
23  
24 received. The results showed that the Cronbach's  $\alpha$  for each variable was above 0.7,  
25  
26 indicating good internal consistency. The results of explanatory factor analysis showed that  
27  
28 the KMO index for the above constructs was all above 0.7, and the community and factor  
29  
30 loadings of each item were all over 0.5, indicating that the questionnaire had an acceptable  
31  
32 validity structure.  
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38  
39 The research team distributed questionnaires in four cities in southeast China, including  
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41 Hong Kong, Shanghai, Xiamen, and Quanzhou. The southeast region of China has a  
42  
43 developed economy and prosperous tourism and hospitality markets. Hong Kong is a Special  
44  
45 Administrative Region (SAR) of China; Shanghai was ranked first in China's national  
46  
47 tourism administration's top city destinations in 2018; Xiamen and Quanzhou are port cities  
48  
49 and scenic tourist destinations. Undergraduate students on internships at the hotels were  
50  
51 employed to deliver questionnaires through convenience sampling. The research team  
52  
53 collected data in 16 medium and high-star-level hotels, including ten five-star, four four-star,  
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4 and two three-star hotels. To ensure data quality, employees were informed about the  
5  
6 research context and purpose and were assured of anonymity. The questionnaires were  
7  
8 distributed face-to-face and collected on-site. In total, 650 questionnaires were distributed,  
9  
10 and 571 valid forms were returned, yielding an 87.85% effective response rate.  
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12  
13

#### 14 15 **4. Results**

##### 16 17 18 **4.1. Characteristics of respondents**

19  
20  
21 The profile of the respondents is presented in Table 1.

22  
23  
24  
25 [Insert Table 1 here]

##### 26 27 28 **4.2. Common method variance (CMV)**

29  
30  
31 Several *a priori* procedures, such as disrupting the order of topics, setting the items in  
32  
33 the reverse direction, and measuring anonymously, were adopted to avoid CMV. The  
34  
35 respondents were informed that there were no right or wrong answers as well. After the data  
36  
37 were collected, Harman's single-factor test was conducted by including all items for PCA  
38  
39 without rotation. The results showed that the KMO index was 0.903 ( $> 0.7$ ) and the first  
40  
41 principal component explained 36.024% of common method variance, which is lower than  
42  
43 the threshold of 40% (Podsakoff et al., 2003). Moreover, the maximum value of the variance  
44  
45 inflation factor (VIF) of each regression was 2.193, less than the threshold of 3. Thus, CMV  
46  
47 was not a major concern in this research.  
48  
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##### 54 55 **4.3. Reliability and validity tests**

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57  
58 Confirmatory factor analysis (CFA) was conducted to examine the convergent and  
59  
60

discriminant validities of each construct. The CFA results were above the suggested levels:

$\chi^2/df = 3.033$  ( $1 < \chi^2/df < 5$ ),  $RMSEA = 0.060$  ( $< 0.08$ ),  $SRMR = 0.0531$  ( $< 0.08$ ),  $GFI = 0.905$  ( $> 0.9$ ),  $NFI = 0.916$  ( $> 0.9$ ),  $IFI = 0.942$  ( $> 0.9$ ),  $TLI = 0.931$  ( $> 0.9$ ),  $CFI = 0.942$  ( $> 0.9$ ),  $PNFI = 0.767$  ( $> 0.5$ ) (Table 2), indicating that the factor model fitted well with the actual data.

Both the standard factor loadings and average variances extracted (AVEs) of each construct were about 0.5, and the composite reliabilities (CRs) were more than 0.7, indicating acceptable convergent validity.

[Insert Table 2 here]

#### 4.4. Correlation analysis

As shown in Table 3, there were strong correlations between the main constructs, and the relationships were according to expectations. Moreover, the square root of the AVEs of each construct were higher than the correlation of the specific construct with any other construct in the model, which confirmed the discriminant validity of each construct.

[Insert Table 3 here]

#### 4.5. Structural paths and tests of hypotheses

Structural equation modeling (SEM) provided by AMOS 21.0 was applied to investigate the multiple relationships between safety behavior and negative safety outcomes, and the sample number for the bootstrap was 2000 with a 95% confidence interval (CI). As shown in Table 4, the factor model fit well with the data and could be used for hypothesis testing.

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3  
4 In terms of the direct effect, safety compliance had a positive and significant impact on  
5  
6 safety participation ( $\beta = 0.407$ ,  $p = 0.001$ ), which supported Hypothesis 1a. In line with  
7  
8 Hypothesis 1b and 1c, safety compliance ( $\beta = 0.522$ ,  $p = 0.001$ ) and safety participation ( $\beta =$   
9  
10  $0.191$ ,  $p = 0.001$ ) had positive and significant impacts on safety adaptation. Finally, the  
11  
12 results also provided support for Hypothesis 2b and 2c, that is, safety participation ( $\beta =$   
13  
14  $-0.248$ ,  $p = 0.001$ ) and safety adaptation ( $\beta = -0.212$ ,  $p = 0.001$ ) had negative and significant  
15  
16 impacts on negative safety outcomes. However, the direct effect of safety compliance on  
17  
18 negative safety outcomes was not significant ( $\beta = -0.091$ ,  $p = 0.172$ ).  
19  
20  
21  
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24

25 To investigate the indirect effects, the biased-corrected bootstrapping method was  
26  
27 employed. The results indicated that both safety adaptation and safety participation  
28  
29 completely mediated the relationship between safety compliance and negative safety  
30  
31 outcomes (SC  $\rightarrow$  SP  $\rightarrow$  SA  $\rightarrow$  NSO;  $-0.234$ ,  $p = 0.001$ , CI:  $-0.335$ ,  $-0.152$ ), supporting  
32  
33 Hypothesis 3a. Consistent with Hypothesis 3b, safety adaptation partially mediated the  
34  
35 relationship between safety participation and negative safety outcomes (SP  $\rightarrow$  SA  $\rightarrow$  NSO;  
36  
37  $-0.042$ ,  $p = 0.001$ , CI:  $-0.083$ ,  $-0.016$ ).  
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44 In terms of total effect, safety compliance had the largest effect on negative safety  
45  
46 outcomes ( $\beta = -0.326$ ,  $p = 0.001$ ), followed by safety participation ( $\beta = -0.291$ ,  $p = 0.001$ ),  
47  
48 and safety adaptation had the smallest effect on negative safety outcomes ( $\beta = -0.212$ ,  $p =$   
49  
50  $0.001$ ).  
51  
52  
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54

55 [Insert Table 4 here]  
56  
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#### 58 ***4.6. The moderation effects of job vigor and emotional exhaustion*** 59 60

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4 Hierarchical regression provided by SPSS 21.0 was performed to investigate the  
5  
6 moderation effects of job vigor and emotional exhaustion of the effect of safety behavior on  
7  
8 negative safety outcomes. The demographic variables were controlled during the analysis as  
9  
10 well the independent and moderating variables were centralized to obtain interaction terms.  
11  
12  
13  
14

15 The moderation effect of job vigor is presented in Table 5. In model 1, the interaction  
16  
17 term (JV×SC) negatively predicted negative safety outcomes ( $\beta = -0.206$ ,  $t = -5.358$ ); in  
18  
19 model 2, the interaction term (JV×SP) had no impact on negative safety outcomes ( $\beta =$   
20  
21  $-0.005$ ,  $t = -0.127$ ); in model 3, the interaction term (JV×SA) negatively predicted negative  
22  
23 safety outcomes ( $\beta = -0.218$ ,  $t = -5.621$ ). These results indicated that job vigor moderated the  
24  
25 relationship between safety compliance/adaptation and negative safety outcomes. The simple  
26  
27 slopes showed that safety compliance/adaptation did not reduce negative safety outcomes  
28  
29 when job vigor was low; however, the relationship between safety compliance/adaptation and  
30  
31 negative safety outcomes was strengthened when job vigor was high (Figure 2). Thus, job  
32  
33 vigor positively moderated the impact of safety compliance/adaptation on negative safety  
34  
35 outcomes, supporting H4a and H4c.  
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43

44 [Insert Table 5 here]

45  
46  
47 [Insert Figure 2 here]

48  
49  
50 The moderation effect of emotional exhaustion is presented in Table 6. In model 1, the  
51  
52 interaction term (EE×SC) had no impact on negative safety outcomes ( $\beta = 0.025$ ,  $t = 0.660$ );  
53  
54 in model 2, the interaction term (EE×SP) positively predicted negative safety outcomes ( $\beta =$   
55  
56  $0.146$ ,  $t = 3.978$ ); in model 3, the interaction term (EE×SA) had no impact on negative safety  
57  
58 outcomes.  
59  
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1  
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4 outcomes ( $\beta = -0.018$ ,  $t = -0.481$ ). These results indicated that emotional exhaustion  
5  
6 moderated the relationship between safety participation and negative safety outcomes. The  
7  
8 simple slopes showed that the relationship between safety participation and negative safety  
9  
10 outcomes was weakened when emotional exhaustion was high (Figure 3). Thus, emotional  
11  
12 exhaustion negatively moderated the impact of safety participation on negative safety  
13  
14 outcomes, supporting H5b.  
15  
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19

20 [Insert Table 6 here]

21  
22  
23 [Insert Figure 3 here]  
24  
25

## 26 **5. Conclusions and implications**

### 27 **5.1. Conclusions**

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33 Based on social learning and conservation of resources theories, this research explored  
34  
35 the impact of hotel employee ternary safety behavior on negative safety outcomes, as well as  
36  
37 investigating the moderation effects of employee job vigor and emotional exhaustion on this  
38  
39 link. The main conclusion is as follows:  
40  
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42

43  
44 First, hotel employee safety behavior is a process of social learning and transformation,  
45  
46 and safety compliance and safety participation have a driving effect on safety adaptation. The  
47  
48 results demonstrated that safety compliance positively affected safety participation, and  
49  
50 safety compliance and safety participation positively influenced safety adaptation. As such,  
51  
52 safety adaptation requires innovative thinking, along with new knowledge and skills that can  
53  
54 be strengthened and developed in employees through social learning from simple and basic  
55  
56 behaviors (e.g., safety compliance and participation). Chen and Chen (2014) confirmed that  
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4 employee in-role safety behavior positively affected ex-role behavior and upward safety  
5  
6 communication, and Zhang et al. (2021) investigated the positive impact of employee safety  
7  
8 compliance and safety participation on safety adaptation. This conclusion was consistent with  
9  
10 the research findings of Chen and Chen (2014) and Zhang et al. (2021). Moreover, safety  
11  
12 participation mediated the impact of safety compliance on adaptation. This suggested that  
13  
14 safety participation plays an intermediate role in the social learning process of safety  
15  
16 behavior, providing strategic guidance for hotels to intervene, regulate and promote employee  
17  
18 safety behavior.

25  
26 Second, employee safety behavior contributes to reducing negative safety outcomes, and  
27  
28 there is a multiple mediation process in their relationship. Previous research has examined the  
29  
30 negative impact of employee safety behavior (safety compliance and participation) on  
31  
32 negative safety outcomes (accidents and injuries) in traditional high-risk industries (Christian  
33  
34 et al., 2009; Clark, 2006; Li et al., 2010; Tong et al., 2020). This research confirmed this  
35  
36 finding in the hospitality sector. As an extension of these findings, based on the ternary  
37  
38 structural model of safety behavior, the research confirmed that three dimensions of safety  
39  
40 behavior have different performance orientations, and safety compliance had the largest  
41  
42 downward effect on negative safety outcomes, followed by safety participation, and safety  
43  
44 adaptation. Similarly, this confirmed and extended the ternary structural model of safety  
45  
46 behavior proposed by Zhang et al. (2020). Moreover, safety participation and adaptation  
47  
48 mediated the impact of safety compliance on negative safety outcomes, demonstrating a  
49  
50 social learning, self-reinforcement, and multi-mediating process for safety behavior's  
51  
52 influence on outcomes, as well as the critical mediation roles played by safety participation  
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4 and adaptation. Previous empirical investigations on employee safety behaviors mostly  
5  
6 focused on its antecedents, and Zhang et al. (2021) emphasized the need to conduct more  
7  
8 research on outcomes. Thus, this research addressed this call and enriched and expanded  
9  
10 empirical research on the effects of employee safety behavior.  
11  
12  
13

14  
15 Third, job vigor positively moderated the effect of safety compliance and adaptation on  
16  
17 negative safety outcomes, and emotional exhaustion negatively moderated the effect of safety  
18  
19 participation on negative safety outcomes. The empirical results showed that high-vigor  
20  
21 employees had easier access to resources as well as stronger resistance to the threat of  
22  
23 resource loss, thereby supporting the impact of safety behavior on negative safety outcomes.  
24  
25 This was consistent with the value-added spiral effect. In contrast, to avoid falling into a  
26  
27 resource loss spiral, the safety behavior of high emotional exhaustion employees was less  
28  
29 likely to adopt resource depletion behavior, thereby weakening the impact of employee safety  
30  
31 behavior on negative safety outcomes. Tong et al. (2020) confirmed that emotional  
32  
33 exhaustion weakened the impact of employee safety compliance and participation on  
34  
35 frontline oil workers' unsafe behavior. This research confirmed this negative moderation  
36  
37 effect in the hospitality sector. Overall, the higher the employees' job vigor and the lower  
38  
39 their emotional exhaustion, the stronger was the impact of safety behavior on negative safety  
40  
41 outcomes. Although the boundary conditions for the impact of employee safety behavior  
42  
43 have received some attention, limited research has examined the moderation effect of job  
44  
45 vigor and emotional exhaustion on safety behavior affecting the outcomes from the resource  
46  
47 conservation perspective, revealing these moderation effects can accurately predict the  
48  
49 outcomes of hotel employee safety behavior.  
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## 5.2. Theoretical implications

First, based on social learning theory and the ternary model of safety behavior, this research revealed the social learning mechanisms for employee safety behavior in services, which enriches the research literature on employee safety behavior and the outcomes. Although the impact of employee safety behavior on negative safety outcomes have been confirmed, the focus is on traditional high-risk occupations and service industries lack investigation (Christian et al., 2009; Neal and Griffin, 2006). Moreover, the extant research fails to reveal the self-reinforcement and multiple mediation effects of safety behavior on negative safety outcomes. In expanding the research, this study examined the impact of employee ternary safety behavior on negative safety outcomes in comprehensive service contexts such as hotels and confirmed the multiple mediation effects of safety behavior and safety outcome performance based on social learning theory. These conclusions provide a theoretical basis for service enterprises to intervene and promote employee safety behavior. Therefore, the theoretical contribution of this research is to extend the investigation of the effect of employee safety behavior from traditional high-risk industries to service industries, which clarifies the social learning process of employee safety behavior in services. Moreover, this research extends the application of social learning theory in the occupational safety field, particularly in service occupational safety.

Second, based on conservation of resources theory, this research investigated the moderation effects of job vigor and emotional exhaustion on employee ternary safety behavior-negative safety outcomes, which highlighted the supporting role of employee resource conservation in services for adopting safety behavior and reducing negative safety

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4 outcomes. Compared with traditional high-risk industries, employees of service enterprises  
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6 are involved in high-intensity physical, intellectual, and emotional labor (Chen et al., 2019),  
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8 which requires them to have sufficient resources to quickly respond to internal and external  
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10 service demands. Accordingly, it is necessary to investigate boundary conditions on the  
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12 impact of employee safety behavior based on a resource conservation perspective in services.  
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16 However, current relevant research is limited to traditional high-risk industries such as oil,  
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18 chemicals, and construction (Li et al., 2010; Xia et al., 2018; Tong et al., 2020). Job vigor and  
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20 emotional exhaustion are physiological states and emotional experiences commonly found  
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22 with employees in service process, and are important indicators for assessing their resource  
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24 stocks and energy (Karatepe et al., 2010; Chen et al., 2019). Based on conservation of  
25  
26 resources theory, this research initially regarded job vigor and emotional exhaustion as  
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28 positive and negative resources respectively possessed by an employee and confirmed their  
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30 positive and negative moderation roles for the relationship between safety behavior and  
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32 negative safety outcomes combining the resource value-added and loss spiral effects. Thus,  
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34 this research extends the investigation of the boundary conditions in the influence of  
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36 employee safety behavior from a resource conservation perspective. This represents an  
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38 extension of safety behavior research and provides a theoretical basis for evaluating the  
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40 effectiveness of employee safety behavior in the service industries. The theoretical  
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42 contribution of this research is in identifying new moderation variables for the effect of  
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44 employee safety behavior in services, as well as providing valuable insights for investigating  
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46 future safety behavior and outcomes.  
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### 5.3. Practical implications

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4 First, **managers of service enterprises should** establish employee safety behavior systems  
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6 and develop tailored strategies for managing safety based upon different dimensions.  
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9 Regarding safety compliance, managers should develop a clear safety management system  
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11 and safety program and combine safety responsibilities with the safety requirements for each  
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13 position. **Managers should implement safety training and education to address potential**  
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15 **conflicts in service provision, emphasizing that personalized service is also based on**  
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17 **compliance with safety requirements.** Regarding safety participation, managers should  
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19 establish safety behavior incentive plans, and cultivate enthusiasm for engaging in safety  
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21 activities. Managers should reward and commend employees for proactive behaviors that are  
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23 conducive to workplace safety, such as helping colleagues solve safety issues, attending  
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25 safety training and meetings, **and learning safety knowledge.** Regarding safety adaptation,  
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27 managers should appropriately empower employees, encourage them to solve problems  
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29 through innovative methods and develop a creative atmosphere that supports safety. In  
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31 addition, managers should confer the honor of “outstanding employees” on those who  
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33 creatively solve safety issues, thereby providing role models for others to learn about safety  
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35 adaptation.  
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46 Second, **managers of service enterprises** should motivate job vigor, relieve emotional  
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48 exhaustion, and provide resource support for employees to adopt safety behavior and reduce  
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50 service accidents. Regarding job vigor, managers should frequently evaluate job vigor as an  
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52 assessment criterion during the hiring process and for subsequent job promotions. Moreover,  
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54 managers should create a relaxed and worry-free work environment so that employees retain  
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56 their passion and energy. **Managers should provide support and assistance to employees who**  
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suffer negative safety outcomes such as service failures and security accidents, and help employees to collectively deal with potential risk in service provision. For less emotional exhaustion, managers should pay attention and track the changes in employee emotional status and provide positive feedback on employee negative emotions and experiences. Managers should also establish “care plans” and allow employees who have already had symptoms of emotional exhaustion to take a temporary rest, so as not to become more exhausted. In addition, managers should redesign job responsibilities and tasks according to employee resource stocks. For example, managers should assign employees with high vigor to positions with high physical and emotional labor and frequent safety behaviors, and provide them with greater support, thereby reducing negative safety outcomes and improving service and safety performance.

## 6. Limitations and future research directions

This investigation had several limitations. First, the survey was conducted with the same measurement system within a certain period. Future research should apply a longitudinal design to test the conceptual model. Second, the questionnaire was collected from 16 star-level hotels in four cities in southeastern China through convenience sampling, which may limit the generalizability of the conclusions. Future research should validate this proposed conceptual model through random sampling or stratified sampling, as well as in different types of lodging formats (e.g., bed & breakfasts, budget hotels) and different cultural backgrounds. Third, major health crisis events, such as the COVID-19 pandemic, require service workplaces such as hotels to adopt and maintain high-level safety behavior, as well as posing new threats and challenges to the safety development of corporations. Future

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4 research should explore the antecedents and outcomes of employee safety behavior during a  
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6 major global crisis such as COVID-19, which will contribute more to the knowledge on  
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8 employee safety behaviors. Fourth, this research focused on workplace safety from an  
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10 employee perspective and did not consider customer viewpoints on safety issues related to  
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12 hotel services, as well as the potential conflict between employee safety behavior and  
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14 customer service experiences. Future research is warranted to investigate service safety issues  
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16 and employee safety responses from an employee-customer interaction perspective, to  
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18 achieve a collaborative improvement of safety and service performance.  
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	n = 571				n = 571		
	Category	n	%		Category	n	%
Gender	Male	239	41.9%	Department	Front office	155	27.1%
	Female	332	58.1%		Food and beverage	202	35.4%
Marital status	Married	120	21.0%		Housekeeping	66	11.6%
	Unmarried	451	79.0%		Entertainment	16	2.8%
Job position	Trainee	190	33.3%		Security	18	3.2%
	Junior staff	259	45.4%		Kitchen	37	6.5%
	Foreman	58	10.2%		Finance	5	0.9%
	Supervisor	42	7.4%		Sales	28	4.9%
	Manager	20	3.5%		Engineering	17	3.0%
	Director	2	0.4%		Human resources	27	4.7%
Education	Junior high college or below	34	6.0%	Age	20 or below	48	8.4%
	Senior high school	127	22.2%		20-29	409	71.6%
	Junior college	159	27.8%		30-39	83	14.5%
	Bachelor's degree	250	43.8%		40-49	27	4.7%
	Master's degree or above	1	0.2%		50-59	4	0.7%
Monthly income (CNY)	≤ 2,500	212	37.1%	Work experience (years)	Less than one	244	42.7%
	2,501-5,000	279	48.9%		1-3	216	37.8%
	5,001-10,000	33	5.8%		3-5	78	13.7%
	10,001-20,000	38	6.7%		5-10	18	3.2%
	≥ 20,001	9	1.6%		More than 10	15	2.6%

Table 2. CFA results

Constructs	Items	Factor loadings	T	AVE	CR
Safety compliance	I use all the necessary safety equipment to do my job	0.739	-	0.6582	0.8515
	I use the correct safety procedures for carrying my job	0.903	19.802		
	I ensure the highest levels of safety when I carry out my job	0.783	17.932		
Safety participation	I am involved the development of hotel safety programs or goals actively	0.524	-	0.5233	0.7605
	I put in extra effort to improve the safety conditions of my workplace	0.759	11.413		
	I voluntarily carry out tasks or activities that help to improve workplace safety	0.848	11.126		
Safety adaptation	I actively pay close attention to new issues about hotel safety	0.698	-	0.6686	0.8885
	I propose creative ideas and suggestions for hotel security	0.753	21.716		
	I promote and champion new ideas of hotel safety to my colleagues	0.932	19.958		
	I search and try new ways to improve the safety conditions in the hotel	0.867	19.085		
Negative safety outcomes	I have a work-related illness due to hotel work	0.691	-	0.5603	0.7921
	I was injured due to hotel work	0.794	15.782		
	I feel insecure due to hotel work	0.757	13.477		
Job vigor	When I get up in the morning, I feel like going to work	0.665	-	0.5230	0.8653
	At my work, I feel bursting with energy	0.867	17.717		
	At my work I always persevere, even when things do not go well	0.820	16.505		
	I can continue working for very long periods at a time	0.577	13.532		
	At my job, I am very resilient, mentally	0.592	12.454		
	At my job, I feel strong and vigorous	0.767	15.588		
Emotional exhaustion	I feel emotionally drained from my work	0.781	-	0.6417	0.8994
	I feel used up at the end of the workday	0.774	23.343		
	I feel fatigued when I get up in the morning and have to face another day on the job	0.874	22.666		
	Working with people all day is really a strain for me	0.790	19.584		
	I feel burned out from my work	0.782	19.407		

Table 3. The results of correlation analysis

Constructs	Mean	SD	1	2	3	4	5	6
Safety compliance	5.03	1.05	(0.811)					
Safety participation	4.83	1.08	0.282**	(0.723)				
Safety adaptation	4.68	1.09	0.561**	0.315**	(0.818)			
Negative safety outcomes	3.57	1.29	-0.275**	-0.294**	-0.307**	(0.749)		
Job vigor	4.14	1.11	0.448**	0.299**	0.538**	-0.420**	(0.723)	
Emotional exhaustion	3.89	1.23	-0.192**	-0.325**	-0.241**	0.472**	-0.604**	(0.801)

Notes: \*\*p<0.001; the diagonal element is the square root of the extracted mean variance.

Table 4. Path analysis results

	Path	Estimate	S.E.	Bias-corrected 95% CI		p	Goodness-fit-indices
				Lower	Higher		
Direct effect	SC→SP	0.407	0.058	0.281	0.519	0.001	$\chi^2/df=3.099$ RMSEA=0.061 SRMR=0.0483 GFI=0.954 AGFI=0.929 NFI=0.952 IFI=0.967 TLI=0.956 CFI=0.967 PNFI=0.708
	SC→SA	0.522	0.052	0.417	0.616	0.001	
	SP→SA	0.191	0.056	0.081	0.303	0.001	
	SA→NSO	-0.212	0.065	-0.346	-0.094	0.001	
	SC→NSO	-0.091	0.069	-0.226	0.048	0.172	
	SP→NSO	-0.248	0.068	-0.385	-0.122	0.001	
Indirect effect	SC→SP→SA	0.078	0.026	0.035	0.141	0.000	
	SC→SP→SA→NSO	-0.234	0.045	-0.335	-0.152	0.001	
	SP→SA→NSO	-0.042	0.016	-0.083	-0.016	0.001	
Total effect	SC→SA	0.600	0.039	0.519	0.670	0.001	
	SC→NSO	-0.326	0.054	-0.431	-0.219	0.001	
	SP→NSO	-0.291	0.068	-0.429	-0.159	0.001	

Notes: SC = Safety compliance; SP = Safety participation; SA = Safety adaptation; NSO = Negative safety outcomes

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Variables		Dependent variable: negative safety outcomes					
		Model 1		Model 2		Model 3	
		$\beta$	t	$\beta$	t	$\beta$	t
Control variables	Gender	0.048	1.221	0.057	1.417	0.034	0.864
	Marital	-0.046	-0.924	-0.059	-1.166	-0.037	-0.744
	Age	0.014	0.276	0.038	0.753	0.014	0.285
	Education	0.004	0.087	-0.013	-0.313	0.005	0.121
	Department	-0.068	-1.774	-0.057	-1.46	-0.075	-1.957
	Position	-0.029	-0.484	0.023	0.382	-0.013	-0.219
	Monthly income	0.044	0.890	0.034	0.69	0.038	0.776
	Work experience	-0.023	-0.36	-0.122	-1.917	-0.037	-0.581
Independent variables	Safety compliance (SC)	-0.084*	-2.001				
	Safety participation (SP)			-0.178***	-4.424		
	Safety adaptation (SA)					-0.081	-1.79
	Job vigor (JV)	-0.346***	-8.029	-0.352***	-8.472	-0.333***	-7.221
Interaction terms	SC×JV	-0.206***	-5.358				
	SP×JV			-0.005	-0.127		
	SA×JV					-0.218***	-5.621
R2		0.241		0.223		0.245	
Adj-R2		0.226		0.208		0.230	
$\Delta$ R2		0.039		0.000		0.043	
F		16.101***		14.580		16.484	
DW		1.791		1.867		1.847	



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Variables		Dependent variable: negative safety outcomes					
		Model 1		Model 2		Model 3	
		$\beta$	t	$\beta$	t	$\beta$	t
Control variables	Gender	0.03	0.758	0.015	0.387	0.042	1.079
	Marital	-0.045	-0.904	-0.037	-0.755	-0.053	-1.075
	Age	0.060	1.229	0.078	1.609	0.042	0.859
	Education	-0.058	-1.355	-0.048	-1.14	-0.037	-0.868
	Department	-0.011	-0.288	-0.013	-0.337	-0.021	-0.548
	Position	0.046	0.77	0.069	1.16	0.065	1.095
	Monthly income	-0.006	-0.131	-0.024	-0.509	-0.016	-0.339
	Work experience	-0.08	-1.268	-0.119*	-1.962	-0.095	-1.509
Independent variables	Safety compliance (SC)	-0.183***	-4.727				
	Safety participation (SP)			-0.158***	-4.106		
	Safety adaptation (SA)					-0.191***	-4.964
	Emotional exhaustion (EE)	0.451***	11.14	0.416***	10.022	0.433***	10.54
Interaction terms	SC×EE	0.025	0.660				
	SP×EE			0.146***	3.978		
	SA×EE					-0.018	-0.481
R2		0.267		0.279		0.267	
Adj-R2		0.252		0.265		0.253	
$\Delta$ R2		0.001		0.021		0.000	
F		18.386		19.544		18.438	
DW		1.756		1.821		1.731	

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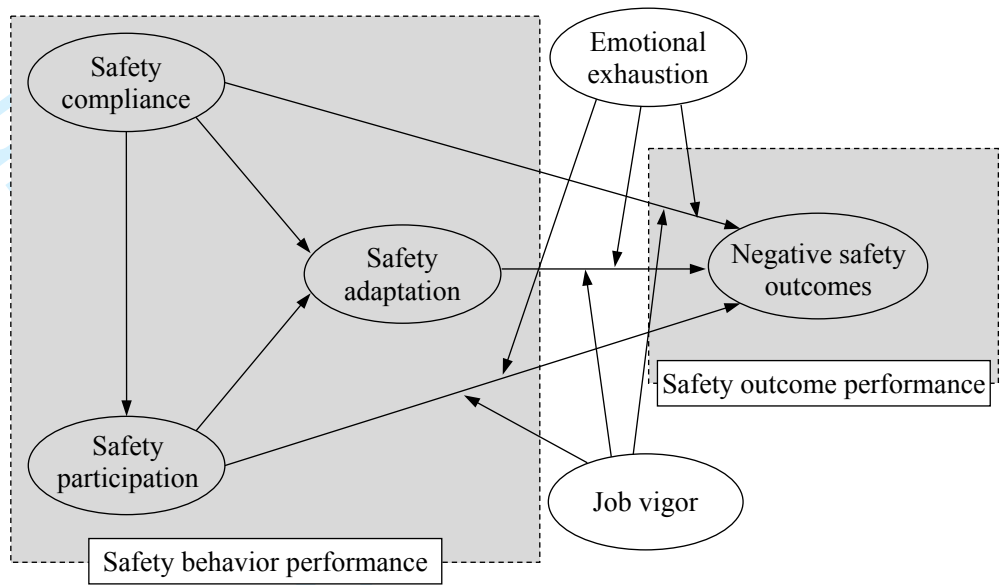


Figure 1. Conceptual model

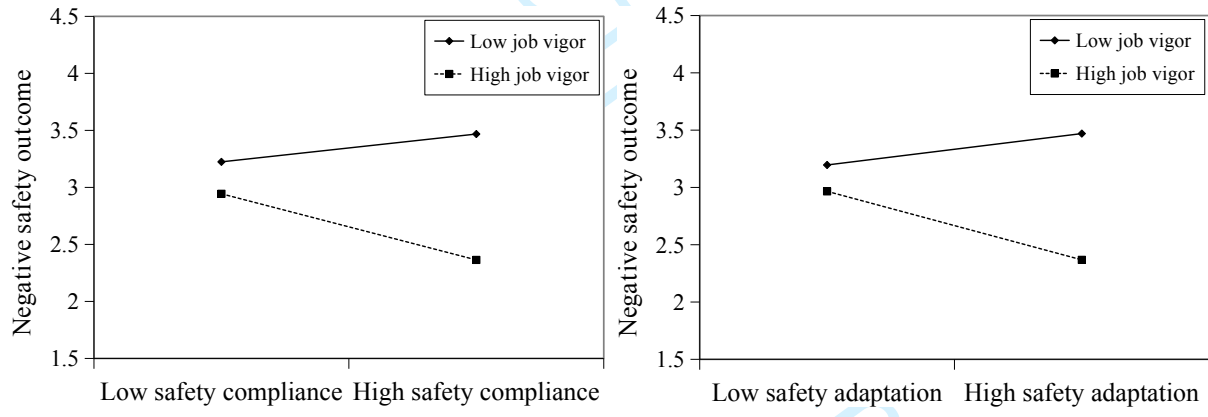


Figure 2. The moderation effect of job vigor

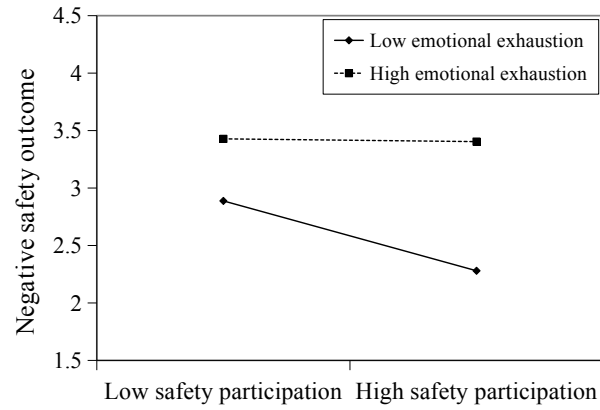


Figure 3. The moderation effect of emotional exhaustion