

Safety not guaranteed: Investigating employees' safety performance during a global pandemic

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ABSTRACT

The COVID-19 pandemic threatened employees' health and safety more than any event in recent years. Although millions of employees transitioned to working from home to mitigate infectious disease exposure, many worksites re-opened amid the pandemic as high infection rates persisted longer than expected. Safety guidelines were issued by the Centers for Disease Control and Prevention, the World Health Organization, and other national initiatives to improve the health and safety of employees returning to on-site work. The current work addresses predictors of infection control safety behaviors in a general working population that largely lacks infection control training and expertise. Drawing from Neal and Griffin's model of safety behavior, we investigated organizational factors (i.e., perceived safety climate, safety-related organizational constraints, occupational risk of COVID-19 exposure) and individual factors (i.e., infection control safety attitudes, conscientiousness, and risk aversion) associated with employees' infection control safety behaviors shortly after returning to on-site work during the pandemic. Survey results from 89 full-time employees across industries demonstrated that the organizational and individual factors accounted for 51.19 percent of the variance in employees' infection control safety behaviors. Organizational factors accounted for 49.02 percent of the explained variance, and individual factors accounted for 50.98 percent of the explained variance. Conscientiousness, perceived safety climate, safety-related organizational constraints, and infection control safety attitudes explained significant variance in employees' infection control safety behaviors, while the occupational risk of COVID-19 exposure and risk aversion did not. Organizations may benefit from considering employees' conscientiousness and safety attitudes during employee selection as well as enhancing their organization's safety climate and mitigating safety-related organizational constraints.

The COVID-19 pandemic threatened employees' physical safety and health more than any event in recent years. The new coronavirus (SARS-CoV-2) is approximately 10 times more deadly than the flu, with a median case-fatality rate of 2.0 % across countries worldwide (Johns Hopkins, 2021). In March 2020, millions of on-site employees transitioned to remote work to mitigate the risk of contracting the disease (Parker, Horowitz, & Minkin, 2020). However, when the pandemic persisted longer than anticipated, many worksites re-opened to varying degrees with new safety guidelines outlined by the Centers for Disease Control and Prevention (CDC; Centers for Disease Control and Prevention, 2021), the World Health Organization (WHO; World Health Organization, 2020), and other national initiatives (e.g., United Kingdom Health and Safety Executive, 2021). With the pandemic still raging, workplaces were under great pressure to help their employees mitigate COVID-19 exposure by engaging in infection control safety behaviors (Yuan et al., 2020).

Despite the importance of engaging in infection control safety behaviors, people are notoriously poor at complying with even basic health and safety measures. For example, the CDC and WHO recommend

handwashing for at least 15 s before or after engaging in high-risk activities (e.g., after using the restroom, after coughing or sneezing, before handling food) to remove germs and prevent viral contagion to others (Centers for Disease Control and Prevention, 2020; World Health Organization, 2009). However, a study from Michigan State University found that many people do not comply with even these basic recommendations (Borchgrevink et al., 2013). Specifically, they found that men and women washed their hands on average for 6.27 and 7.07 s after using the restroom, respectively, and many individuals skipped handwashing altogether. Even during the COVID-19 pandemic, compliance with hygiene behaviors remained relatively low among the general public, with 53% of participants indicating they did not wash their hands after coughing/sneezing and 27% indicating they did not use hand disinfectant (Nivette et al., 2021).

As the pandemic persisted, workplaces across industries were tasked with mitigating non-compliance to protect the health of their employees, customers, patients, and other stakeholders during the global pandemic. In-depth occupational training on infection control behaviors has traditionally been limited to employees in certain fields, such as

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healthcare, who routinely encounter life-threatening diseases (e.g., HIV and hepatitis B; Branson, 2007; Centers for Disease Control and Prevention, 1987). During a pandemic, however, infection control behaviors are needed in almost every occupation; on-site workers in almost every field had some degree of exposure to the COVID-19 virus. Thus, the COVID-19 pandemic presented a pressing problem: how to encourage the enactment of infection control safety behaviors in a general working population that largely lacks infection control training and experience.

To enhance the understanding of factors that may influence the enactment of infection control safety behaviors in a general working population, we draw from Neal and Griffin's (2004) model of safety behavior. The model outlines work environment and individual factors associated with employees' safety behavior across various contexts (Neal & Griffin, 2004). Specifically, we examine three work environment antecedents (i.e., perceived safety climate, safety-related organizational constraints, and occupational risk of COVID-19 exposure) and three individual antecedents (i.e., infection control safety attitudes, conscientiousness, and risk aversion) as they relate to workers' infection control safety behavior in the midst of the COVID-19 pandemic. Together, these factors are theorized to predict substantial variance in employees' safety behavior across various contexts (Neal & Griffin, 2004), which was of particular importance as employees navigated working in-person during a pandemic.

This research contributes to extant knowledge in four primary ways. First, it examines the enactment of infection control behaviors in a general, non-expert population. Traditionally, infection control behaviors have been primarily relevant in healthcare (DeJoy et al., 2000; Gershon et al., 1995; McGovern et al., 2000), and employees who self-select into healthcare fields may be better equipped to manage infectious exposures. The COVID-19 pandemic presented a unique opportunity to examine infection control safety behaviors with minimal selection effects.

Second, the COVID-19 pandemic created an opportunity to examine an under-studied work environment antecedent of safety behavior: occupational risk. Researchers generally hypothesize that risk is positively associated with employee safety behavior (Nahrgang et al., 2011; Xia et al., 2017); however, limited research has been able to directly test the hypothesis across occupations due to the disparate nature of safety behaviors and variation in risk factors across industries (e.g., universal precautions to mitigate exposure to blood-borne pathogens in healthcare, clean room procedures to mitigate dangerous chemical exposure in nuclear engineering). The pandemic created a unique scenario in which on-site employees across industries faced the risk of COVID-19 exposure, which necessitated the application of infection control procedures to their organizations.

Third, the current work answers calls to compare individual and organizational factors that predict safety behavior (Beus et al., 2015). Beus and colleagues (2015) aptly highlighted "the necessity of integrating these perspectives to gain a more complete understanding of the importance of personality relative to known contextual factors in explaining safety-related behavior," (p. 485). Researchers have begun to integrate these literatures, with a primary focus on personality variables and perceived safety climate (Beus et al., 2015; Beus et al., 2016; Cornelissen et al., 2017). The current research extends previous work by capturing a wider range of individual and organizational factors related to safety behavior. By examining multiple environmental and individual predictors of infection control safety behavior in the same study, the current work enables the exploration of the unique contributions of these indicators to infection control safety behaviors.

Finally, this work fulfills a practical need during the COVID-19 pandemic and beyond. Organizations tried to increase COVID-19 infection control safety behaviors without a roadmap. This work can help organizations identify opportunities for intervention that may enhance infection control safety performance. Experts warn that the risk of future outbreaks, including those that escalate to epidemics or

pandemics, is on the rise due to increased global travel, urbanization, climate change, human-animal contact, and health worker shortages in under-developed countries (Dodds, 2019). This research can have tangible consequences in lives saved for the remainder of the COVID-19 pandemic, future health crises, and even "normal" contagion events such as the annual flu season.

1. Literature review and Hypothesis development

Neal and Griffin (2004) propose a theoretical framework, drawn from decades of research on safety behaviors and job performance (e.g., Barling et al., 2002; Borman & Motowidlo, 1993; Campbell et al., 1993; Griffin & Neal, 2000; Zohar, 2003), for understanding and predicting employees' safety performance. Modeled after job performance, safety performance is conceptualized as employees' safety compliance (i.e., core behaviors employees are expected to engage in to maintain workplace safety, such as hand washing and social distancing) and safety participation (i.e., additional behaviors that support a strong safety-oriented environment, such as encouraging others to follow safety guidelines; Borman & Motowidlo, 1993; Griffin & Neal, 2000).

According to the model, safety performance is predicted by work environment and individual theoretical antecedents (Neal & Griffin, 2004). Neal and Griffin (2004) divide work environment antecedents into two subcategories: safety climate and organizational factors. Safety climate refers to perceptions of the importance an organization places on safety (Zohar, 1980). Organizational factors include other aspects of the work environment, such as work design and environmental hazards (Neal & Griffin, 2004). Individual antecedents can be categorized as either individuals' attitudes or individual differences (Neal & Griffin, 2004). Attitudes refer to individuals' feelings and beliefs, and individual differences refer to other personal characteristics (e.g., personality, demographics). These antecedents are thought to relate to employees' safety performance through the acquisition of safety knowledge, skills, and motivation (Campbell et al., 1993; Neal & Griffin, 2004). To illustrate, the theoretical model from Neal and Griffin (2004) is displayed in Fig. 1.

Researchers have drawn from aspects of Neal and Griffin's (2004) theoretical safety model to predict and explain safety performance across a wide variety of contexts (Christian et al., 2009), such as retail stores (DeJoy et al., 2004), coal mines (Paul & Maiti, 2007), and healthcare settings (Neal & Griffin, 2006). Given its generalizability and predictive power, Neal and Griffin's (2004) model serves as our underlying theoretical framework for examining factors that relate to the enactment of CDC-recommended infection control safety behaviors in a general, non-expert population. Drawing from the Neal and Griffin (2004) model of safety behavior, we examine three work environment antecedents (i.e., perceived safety climate, safety-related organizational constraints, and occupational risk of COVID-19 exposure) and three individual antecedents (i.e., infection control safety attitudes, conscientiousness, and risk aversion) of infection control safety behaviors at work during the COVID-19 pandemic. The selected factors cover each subcategory of antecedents from Neal and Griffin's (2004) theoretical model (i.e., safety climate, organizational factors, attitudes, and individual differences), which should mitigate construct overlap and increase the antecedents' combined ability to explain variance in infection control safety performance. The selected antecedents are described below.

1.1. Safety climate

Zohar (1980) introduced safety climate as "employees' perceptions about the relative importance of safe conduct in their occupational behavior," (p. 96). Since its inception, safety climate has dominated the safety literature (Hofmann et al., 2017), with studies consistently demonstrating its importance to workers' safety performance (Beus et al., 2015; Christian et al., 2009; Clarke, 2006; Nahrgang et al., 2011).

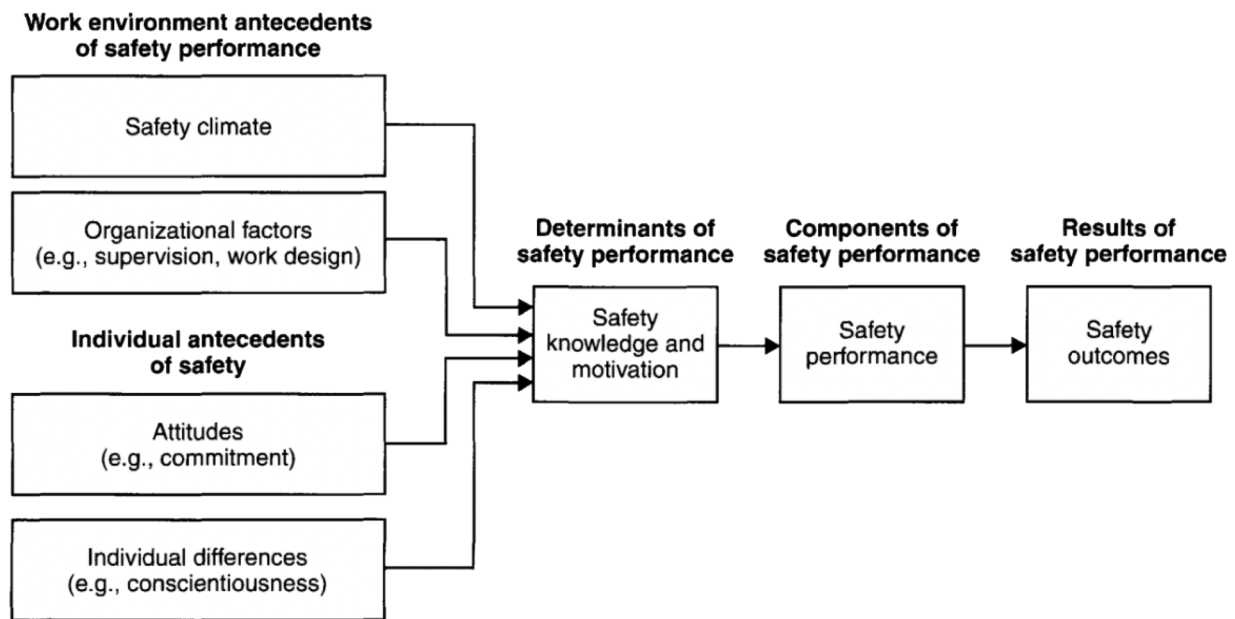


Fig. 1. Theoretical model of safety behavior taken from Neal and Griffin (2004).

According to social information processing theory, individuals inherently assess the behaviors and reactions of others as a means of understanding their environment and forming their beliefs (Salancik & Pfeffer, 1978). Aligning with social information processing theory, safety climate is largely shaped by the behaviors and attitudes of employees' supervisors and coworkers; employees who perceive that their colleagues are proponents of strong safety behaviors perceive that their personal safe conduct is important (Zohar, 1980). This social information drives employees' safety performance beyond their rational decision-making processes and individual predispositions (Salancik & Pfeffer, 1978). Indeed, research suggests that perceptions of safety climate account for more variance in safety performance than individual attitudes and personality (Beus et al., 2015; DeJoy et al., 2000). Preliminary research demonstrates the importance of perceived safety climate to safety performance among hospitality employees (Kim et al., 2021) and nurses (Ghasemi et al., 2020) during COVID-19. We hypothesize that employees who perceive their supervisor and coworkers advocate for strong safety performance during COVID-19 will exhibit stronger safety performance themselves.

Hypothesis 1. *Perceived safety climate is positively associated with employees' infection control safety performance.*

1.2. Safety-related organizational constraints

According to Neal and Griffin's (2004) theoretical model of safety behavior, organizational factors can further promote or hinder employees' ability to exhibit strong safety performance (Neal & Griffin, 2004). Organizational constraints are tangible and intangible barriers that prevent employees from translating their ability and effort into strong job performance (Peters & O'Connor, 1980). While organizational constraints are typically conceptualized as barriers to task performance (e.g., poor equipment makes it difficult to produce widgets), there are also organizational constraints that serve as barriers to safety performance (e.g., crowded facilities make it difficult to socially distance). During the COVID-19 pandemic, constraints included barriers that made it difficult or inconvenient to follow infection control safety guidelines, such as personal protective equipment (PPE) shortages, crowded worksites, and work pressure constraints (Ehrlich et al., 2020; Moreno-Jiménez et al., 2021; Sinclair et al., 2020). In an unpublished qualitative study conducted during the COVID-19 pandemic, a nurse

described "wear[ing] the same mask and the same chemo gown for a week due to being short on PPE supplies" (Gray et al., 2021, np). An engineer explained that their workplace tried to "setup plexiglass guards at different stations around the plant. [... However, they made it too] difficult to hear what anyone is saying on the manufacturing floor" (Gray et al., 2021, np). Necessary work behaviors, such as communicating across a manufacturing floor, made it difficult to implement and adhere to safety guidelines. By definition, such constraints inhibit employees' safety performance.

Hypothesis 2. *Safety-related organizational constraints are negatively associated with employees' infection control safety performance.*

1.3. Occupational risk of COVID-19 exposure

Risks and hazards are other organizational factors that may influence safety performance (Nahrgang et al., 2011; Xia et al., 2017). Risks and hazards are workplace conditions or exposures that threaten employees' health and safety, such as noise, heat, dust, chemicals, and disease (Nahrgang et al., 2011). According to conservation of resource (COR) theory, individuals are inherently motivated to preserve and protect the resources they have and value (Hobfoll et al., 1990). In line with conservation of resource theory, individuals whose resources (e.g., health and safety) are threatened by risks and hazards may be especially inclined to engage in safety behaviors as a means to preserve and protect their health.

The COVID-19 pandemic provides a unique context to examine occupational risk, the level of health and safety hazards inherent to an occupation, as a work environment antecedent of safety performance. During the COVID-19 pandemic, infection control recommendations were applied across industries, and researchers investigated the risk of COVID-19 exposure across a wide variety of occupations (Lu, 2020). For example, healthcare workers were at a greater risk of COVID-19 exposure than construction workers (Lu, 2020). Because risks and hazards are typically industry-specific, little existing research directly examines the relationship between occupational risk and safety performance. However, initial research supports a positive association between occupational risk and safety climate. Zohar (1980) examined the safety climate in four disparate industries, finding the highest safety climate scores in chemical plants, followed by metal processing factories, textile factories, and food processing plants. Zohar attributed the findings to

occupational risk, theorizing that employees experiencing greater occupational risks and hazards may take precautions more seriously (1980). We hypothesize a positive association between occupational risk of COVID-19 exposure and infection control safety performance during the COVID-19 pandemic.

Hypothesis 3. *Occupational risk of exposure to COVID-19 is positively associated with employees' infection control safety performance.*

1.4. Infection control safety attitudes

According to Neal and Griffin's (2004) theoretical model of safety behavior, individuals' attitudes also influence their safety performance. Many job attitudes have been linked with safety performance (e.g., job satisfaction, organizational commitment; Barling et al., 2003; Morrow & Crum, 1998), and the most proximal are employees' attitudes about safety behaviors themselves (Neal & Griffin, 2004). Safety attitudes refer to individuals' beliefs and feelings regarding safety behaviors (e.g., safety behaviors make me feel safe, safety behaviors are annoying). Neal and Griffin (2004) argue that safety attitudes should be clearly differentiated from perceptions of safety climate because attitudes are individual beliefs and feelings whereas safety climate is a group-level phenomenon. Supporting the assertion that safety attitudes are meaningfully distinct from safety climate, Mearns et al. (1998) found more variability in safety attitudes among colleagues than perceptions of safety climate. During the COVID-19 pandemic, research found variability in employees' attitudes towards infection control safety measures (Gray et al., 2022). In a qualitative study, employees across three occupations (nurses, engineers, and university staff) generally described safety infection control measures as beneficial, but some indicated that infection control safety measures were too restrictive (Gray et al., 2022). We hypothesize that individuals' attitudes towards COVID-19 safety behavior will relate to their COVID-19 safety performance.

Hypothesis 4. *Positive attitudes regarding infection control safety measures are positively associated with employees' infection control safety performance.*

1.5. Conscientiousness

Neal and Griffin's (2004) model of safety behavior theorizes that individual differences, such as personality, also influence individuals' safety performance. A comprehensive meta-analysis suggests that four of the five Big Five personality variables are associated with employees' safety behaviors; agreeableness and conscientiousness are negatively associated with unsafe behaviors while extraversion and neuroticism are positively associated with them (Beus et al., 2015). Of those, conscientiousness has received the most research attention and is one of the strongest predictors (Beus et al., 2015; Christian et al., 2009). According to the theory of purposeful work behavior, conscientious individuals are inherently motivated to achieve (i.e., show competence and accomplishment; Barrick et al., 2013). Because they are driven to achieve, conscientious individuals have a tendency to be particularly dependable and responsible, which has positive implications for both general job performance and safety performance (Beus et al., 2015; Christian et al., 2009). The theorized relationship between conscientiousness and safety performance has been supported in numerous occupational contexts, including among professional drivers (Seibokaite & Endriulaitiene, 2012) and manufacturing employees (Wallace & Vodanovich, 2003). We hypothesize that this relationship will replicate across a broad range of occupations during the COVID-19 pandemic.

Hypothesis 5. *Conscientiousness is positively associated with employees' infection control safety performance.*

1.6. Risk aversion

Beyond personality, other individual differences influence individuals' safety performance (Neal and Griffin, 2004). Risk aversion is an individual difference variable reflecting an individual's willingness to incur risk across situations (Mandrik & Bao, 2005). As mentioned earlier, conservation of resource (COR) theory posits that individuals are inherently motivated to preserve and protect the resources they have and value (Hobfoll et al., 1990). Individuals who are risk-averse are particularly avoidant of and sensitive to situations with the potential for resource loss. In line with conservation of resource theory, individuals high on risk aversion may be especially inclined to engage in infection control safety behaviors during the COVID-19 pandemic as a means to preserve and protect their health. Therefore, we hypothesize that risk aversion is positively associated with individuals' infection control safety performance and explains unique variance in infection control safety performance beyond the occupational risk of COVID-19 exposure.

Hypothesis 6. *Risk-aversion is positively associated with employees' infection control safety performance.*

1.7. The relative importance of safety performance predictors

Beus and colleagues (2015) highlighted the tendency for research on safety-related work environment and individual factors to fall into separate research streams. They noted the necessity of integrating these perspectives to gain a more comprehensive understanding of how various predictors drive safety-related behavior. Using relatively few studies, Beus et al. (2015) began filling this gap by meta-analytically examining the relative contributions of personality and perceived safety climate, finding that perceived safety climate accounted for the majority of the explained variance while personality explained an additional substantial component. However, limited research has simultaneously investigated a broader range of work environment and individual antecedents. Thus, we examine the relative importance of perceived safety climate, safety-related organizational constraints, occupational risk of COVID-19 exposure, infection control safety attitudes, conscientiousness, and risk aversion to employees' infection control safety performance during the backdrop of an unprecedented global pandemic. Given limited existing research coupled with the novel context of COVID-19, specific hypotheses would be premature.

Research Question 1: What is the relative proportion of variance in COVID-19 infection control safety performance explained by perceived safety climate, safety-related organizational constraints, occupational risk of COVID-19 exposure, infection control safety attitudes, conscientiousness, and risk aversion?

2. Method

2.1. Participants

Data were collected from 232 full-time employees between July 20, 2020 and August 27, 2020 through the online panel, Prolific (Palan & Schitter, 2018). During the time of data collection, the daily number of new confirmed COVID-19 cases worldwide ranged from 202,706 to 328,808 (Dong et al., 2020). Fourteen participants were removed from the study for failing to respond appropriately to attention or comprehension checks or withdrawing from the study. For the purpose of the current study, the sample was restricted to include only employees who recently returned to working on-site after work-from-home initiatives were loosened or lifted during the COVID-19 pandemic. Specifically, participants had to spend at least 25 % of their work hours on-site. One-hundred and twenty-nine participants were excluded because they spent less than 25 percent of their worktime on-site, resulting in an eligible sample of eighty-nine full-time employees (54 male, 35 female).

Participants ranged in age from 24 to 60 ($M = 37.35$, $SD = 8.68$). A total of 22 participants were working onsite approximately 25 percent of the time, 24 participants were working onsite approximately 50 percent of the time, 11 participants were working onsite approximately 75 percent of the time, and 32 participants were working entirely onsite. Employees resided in a variety of European and North American countries (e.g., United States, United Kingdom, Canada, and Portugal) and held diverse occupations (e.g., licensed vocational nurse, occupational therapist, elementary school teacher, financial analyst, computer programmer).

2.2. Measures

2.2.1. Infection control safety performance

Participants were asked how often they engage in or encourage eight COVID-19 infection control safety behaviors. Example items include, “While working on-site, I wear a mask when unable to be six feet away from others.” and “While working on-site, I encourage others to follow safety practices.” Safety behaviors were taken from COVID-19 safety guidelines issued in 2020 by the [Centers for Disease Control and Prevention \(2021\)](#). Participants responded to the items on a 5-point frequency scale (1 = never; 5 = extremely often).

To examine the dimensionality of our safety performance measure, an exploratory factor analysis was performed in SPSS 27. Two eigenvalues were greater than one, and the scree plot showed a point of inflection at two factors. Two factors were extracted using principal axis factoring with a promax rotation of the factor loading matrix. The pattern matrix showed that four items loaded at least 0.60 onto their respective factor, four items loaded < 0.60 on their respective factor, and two items had cross-loadings greater than 0.30. Because two factors did not provide a clean, interpretable solution, the one-factor measure was retained. Cronbach’s alpha was 0.85.

2.2.2. Safety climate

Safety climate was measured using a composite of two safety climate dimensions: supervisor safety and coworker safety. Supervisor safety and coworker safety were measured with 10-item scales from [Hayes et al. \(1998\)](#). First, participants were asked to consider COVID-19 safety recommendations. Then they were asked to rate the extent to which their immediate supervisor engages in safety behaviors, including “praises safe work behaviors” or “enforces safety rules.” Participants were also asked to rate the extent to which their coworkers engage in safety behaviors, including “ignore safety rules” (reverse-scored) or “pay attention to safety rules.” Employees responded on a 5-point scale that ranged from “strongly disagree” to “strongly agree.”

A series of confirmatory factor analyses were conducted to examine the structure of perceived safety climate using the lavaan package in R ([Rosseel, 2012](#)). Theoretical and empirical models of safety climate indicate that perceived safety climate is a hierarchical construct; a variety of specific climate dimensions, such as supervisor safety and coworker safety, load onto a common higher order factor of perceived safety climate ([Griffin & Neal, 2000](#), [James & James, 1989](#), [James, James & Ashe, 1990](#)). In line with this reasoning, we tested a series of confirmatory factor analyses to capture the general factor of perceived safety climate. First, a unidimensional model was examined in which all items for coworker and supervisor safety loaded onto a single factor (see

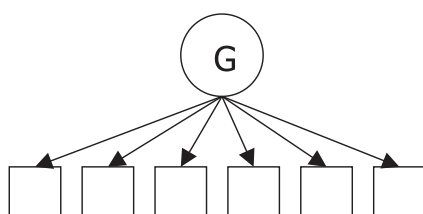


Fig. 2a. Unidimensional model.

[Fig. 2a](#)). This one-factor solution assumes that all measures are influenced by a single general factor (e.g., perceived safety climate), with no influence of narrower factors (e.g., perceived coworker or supervisor safety; [Brunner et al., 2012](#)). As expected, this model exhibited poor fit, $\chi^2(170) = 651.81$, $p < .01$, CFI = 0.654, RMSEA = 0.178.

Second, we examined a higher-order factor model of perceived safety climate in which supervisor safety and coworker safety represent two first-order factors that load onto a common higher-order factor (see [Fig. 2b](#)). This higher order model assumes the influence of a higher order model (perceived safety climate) influences observed variables through the subordinate factors (e.g., perceived coworker and supervisor safety). In other words, the superordinate reflects the tendency for the subordinate factors to be correlated ([Markon, 2019](#)). The higher order factor exhibited generally poor fit, $\chi^2(168) = 355.79$, $p < .01$, CFI = 0.865, RMSEA = 0.112. A model comparison indicates that the higher-order model had significantly better fit than the unidimensional model, $\Delta\chi^2(2) = 296.02$, $p < .01$.

Finally, a bifactor model was conducted to examine the fit of a general factor (e.g., perceived safety climate) that loads directly on to the observed variables ([Brunner et al., 2012](#); [Markon, 2019](#); [Reise, 2012](#); see [Fig. 2c](#)). In this model, the general factor represents the conceptually broad target construct (e.g., perceived safety climate) with the group factors representing conceptually narrow subdomains (e.g., perceived coworker and supervisor safety). As the bifactor model directly captures this higher order factor from the observed variables, it is “ideally suited for representing the construct-relevant multidimensionality that arises in the responses to measures of broad constructs where multiple and distinct domains of item content are included to increase content validity” ([Reise, 2012, p. 668](#)). This model exhibited moderate fit, $\chi^2(150) = 272.83$, $p < .01$, CFI = 0.912, RMSEA = 0.096. A model comparison indicates that the bifactor model had significantly better fit than the higher order model, $\Delta\chi^2(18) = 82.96$, $p < .01$. Due to the improved model fit and theoretical justification for a bifactor model, the latent general variable from the bifactor model of perceived safety climate was used to represent perceived safety climate.

2.2.3. Safety-Related organizational constraints

Participants were asked how inconvenient it was to enact eight safety-related behaviors at work, such as “maintaining at least six feet of distance from others” and “following safety measures mandated by my organization.” Safety-related behaviors came from COVID-19 guidelines outlined by the [Centers for Disease Control and Prevention \(2021\)](#). Participants responded on a 5-point scale (1 = not at all inconvenient; 5 = very inconvenient). Cronbach’s alpha was 0.87.

2.2.4. Occupational risk of COVID-19 exposure

Participants selected their occupation from a list of 100 common occupations taken from [Lu \(2020\)](#). [Lu \(2020\)](#) derived COVID-19 risk scores for each of these occupations, which we assigned to each participant. Scores were based on data from the Occupational Information Network (O*NET) regarding three factors thought to contribute to COVID-19 occupational risk: contact with others, physical proximity,

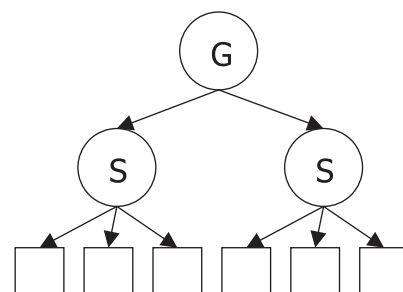


Fig. 2b. Higher-order model.

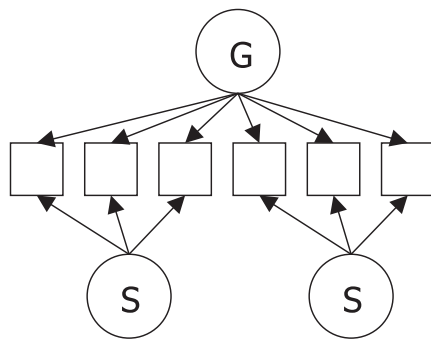


Fig. 2c. Bi-factor model.

and exposure to disease and infection. Each attribute was given equal weight to arrive at a final COVID-19 risk score from zero to 100; higher scores indicate more risk. For example, dental hygienists received a COVID-19 risk score of 99.7 while kindergarten teachers had a score of 65.8. Participants with occupations not included in Lu’s (2020) list had missing values for occupational risk ($n = 22$), and pairwise deletion was used to run analyses.

2.2.5. Infection control safety attitudes

Using a 4-item measure created for this research, participants were asked to express their attitudes toward COVID-19 infection control safety measures by rating the extent to which infection control safety measures elicited various reactions such as “make me feel safe” or “are frustrating.” The items were written based on safety attitudes expressed by employees in an unpublished qualitative study conducted during COVID-19. Participants responded to attitudinal items on a 5-point scale that ranged from “strongly disagree” to “strongly agree.” Cronbach’s alpha was 0.72.

2.2.6. Conscientiousness

Conscientiousness was measured with a 9-item measure from John and Srivastava (1999). Participants responded to items such as “I see myself as someone who does a thorough job” and “I see myself as someone who makes plans and follows through with them.” on a five-point agreement scale (1 = strongly disagree; 5 = strongly agree). Cronbach’s alpha was 0.88.

2.2.7. Risk aversion

A six-item scale from Mandrik and Bao (2005) was used to measure employees’ risk aversion. An example item is, “I do not feel comfortable about taking chances.” Participants responded to the items on a 7-point scale that ranged from “strongly disagree” to “strongly agree.”

Table 1 Means, Standard Deviations, and Intercorrelations Between Study Variables.

Variables	M	SD	1	2	3	4	5	6	7	8	9	10
1. Safety performance	4.02	0.77	(0.85)									
2. Safety climate	0.00	0.48	0.55**	–								
3. Safety-related constraints	2.56	0.84	-0.43**	-0.25*	(0.87)							
4. Safety attitudes	3.89	0.78	0.51**	0.48**	-0.53**	(0.72)						
5. Conscientiousness	4.07	0.70	0.55**	0.38**	-0.26*	0.44**	(0.88)					
6. Risk aversion	4.38	1.05	0.02	-0.08	-0.05	-0.03	-0.22*	(0.84)				
7. Occupational risk ¹	30.50	17.56	0.09	0.06	-0.12	0.16	-0.09	0.09	–			
8. Age	37.35	8.68	0.21*	0.15	-0.17	0.10	0.39**	-0.07	0.08	–		
9. Sex ²	0.39	0.49	0.06	-0.05	-0.07	0.11	0.04	0.09	0.35**	-0.14	–	
10. Country ³	1.75	0.44	0.11	0.02	-0.01	0.04	0.09	0.01	0.06	0.04	0.09	–

Notes. $N = 89$.

¹ Occupational risk is based on data from Lu (2020); scores range from zero to 100. $n = 67$.

² Sex was coded as 0 = male and 1 = female.

³ Country was coded as 1 = North American countries and 2 = European countries. $n = 88$.

* $p < .05$.

** $p < .01$.

Cronbach’s alpha was 0.84.

2.2.8. Demographic variables

Participants reported their age, sex, and country. Older and female individuals may exhibit stronger safety performance than younger and male individuals (Adams et al., 2013; Hersch, 1996; Ng & Feldman, 2008). Employees in different countries may face different circumstances during a global pandemic (e.g., different risks, different cultural norms). We aimed to examine if the work environment and individual factors of focus in our research explain variance in employees’ safety performance above and beyond the age, sex, and country demographic variables.

3. Results

3.1. Descriptive statistics and study correlations

Descriptive statistics and study correlations are depicted in Table 1. The mean level of safety performance was 4.02 out of five (i.e., “often” follow safety guidelines), and the standard deviation was 0.77. To gain a more in depth understanding of safety performance, we examined mean levels across individual safety behaviors at work. In order from strongest to weakest performance, the safety behaviors were: following safety behaviors mandated by one’s organization ($M = 4.57, SD = 0.56$), washing or sanitizing one’s hands after being in a public place ($M = 4.44, SD = 0.83$), washing or sanitizing one’s hands after touching an item or surface frequently touched by others ($M = 4.19, SD = 0.98$), encouraging others to follow safety practices ($M = 4.00, SD = 1.16$), maintaining six feet distance from others ($M = 3.96, SD = 0.89$), wearing a mask when unable to be six feet away from others ($M = 3.71, SD = 1.47$), sanitizing shared equipment before and after use ($M = 3.71, SD = 1.29$), and sanitizing one’s workspace at the beginning and end of each workday ($M = 3.56, SD = 1.41$).

Before examining correlations, a power analysis was performed in G*Power 3.1. With a sample size of 89 participants, our power to detect a moderate Pearson correlation ($\rho = 0.30$) was 0.82. Perceived safety climate, safety attitudes, and conscientiousness were positively associated with safety performance, $r = 0.55, p < .01, r = 0.51, p < .01, r = 0.55, p < .01$, respectively. Organizational constraints were negatively associated with safety performance, $r = -0.43, p < .01$. Occupational risk and risk aversion were not significantly associated with safety performance, $r = 0.09, p > .05, r = 0.02, p > .05$, respectively. The six hypothesized predictors of safety performance had inter-correlations that ranged from -0.53 to 0.48.

3.2. Relative weights analysis

Before running a relative weights analysis, power analyses were performed in G*Power 3.1. With a sample size of 89 participants, six predictors, a moderate to large expected effect size ($f^2 = 0.20$), and a type 1 error rate of 0.05, our power to detect an existing effect (R^2 deviation from zero) with a linear multiple regression was approximately 0.88. Our power associated with tests of significance on individual regression coefficients with small to moderate expected effect sizes ($f^2 = 0.10$) was approximately 0.84. The power associated with tests of significance on relative importance weights is on par with those of beta weights in a multiple regression, although power tends to be higher with a relative weights analysis than with a multiple regression when there are a lot of predictors and substantial collinearity among the predictors (Tonidandel & LeBreton, 2009; Tonidandel & LeBreton, 2011). Therefore, we proceeded with a relative weights analysis.

Results of a relative weights analysis are displayed in Table 2. Johnson's (2000) relative weights analysis was conducted using an R program prepared by Tonidandel and LeBreton (2015). The analysis was conducted to examine the relative associations between each of the hypothesized predictors and safety performance while mitigating concerns of multicollinearity (Johnson, 2000). Together, the organizational and individual safety predictors accounted for 51.19 percent of the variance in employees' safety performance during COVID-19 ($R^2 = 0.5119$). The organizational factors accounted for 49.02 % of the explained variance of the model, and the individual-level factors accounted for 50.98 % of the explained variance.

In order of most to least variance in safety performance explained, the predictors were conscientiousness (33.50 % of the explained variance), perceived safety climate (31.30 % of the explained variance), safety-related organizational constraints (16.60 % of the explained variance), infection control safety attitudes (16.23 % of the explained variance), risk-aversion (1.25 % of the explained variance), and occupational risk of COVID-19 exposure (1.12 % of the explained variance). Confidence interval tests of significance suggest that the partial effects of conscientiousness, perceived safety climate, safety-related organizational constraints, and infection control safety attitudes were significant; the partial effects of risk aversion and occupational risk of COVID-19 exposure were not significant.

We re-ran the relative weights analysis with age, sex, and country included to examine if the work environment and individual factors of focus in our research explain variance in employees' safety performance above and beyond these demographic variables. The significance of the findings remained unchanged as depicted in Table 3.

3.3. Summarizing results regarding study hypotheses

Hypothesis 1 was supported. Perceived safety climate was positively correlated with infection control safety performance, $r = 0.55, p < .01$, and it explained unique variance in infection control safety performance when accounting for other work environment and individual factors, b

$= 0.16, 95 \% CI = [0.06, 0.30]$. Hypothesis 2 was supported. Safety-related organizational constraints were negatively associated with infection control safety performance, $r = -0.43, p < .01$, and they explained unique variance in infection control safety performance when accounting for other work environment and individual factors, $b = 0.09, 95 \% CI = [0.01, 0.21]$. Failing to support Hypothesis 3, occupational risk of COVID-19 exposure was not associated with employees' infection control safety performance, $r = 0.09, p > .05$, and it did not explain unique variance in infection control safety performance when accounting for other work and environment and individual factors, $b = 0.01, 95 \% CI = [-0.02, 0.05]$. Hypothesis 4 was supported. Infection control safety attitudes were positively associated with infection control safety performance, $r = 0.51, p < .01$, and they explained unique variance in infection control safety performance when accounting for other work environment and individual factors, $b = 0.08, 95 \% CI = [0.02, 0.18]$. Hypothesis 5 was supported. Conscientiousness was positively associated with infection control safety performance, $r = 0.55, p < .01$, and it explained unique variance in infection control safety performance when accounting for other work environment and individual factors, $b = 0.17, 95 \% CI = [0.08, 0.28]$. Failing to support Hypothesis 6, employees' risk-aversion was not associated with infection control safety performance, $r = 0.02, p > .05$, and it did not explain unique variance in infection control safety performance when accounting for other work and environment and individual factors, $b = 0.01, 95 \% CI = [-0.03, 0.04]$.

4. Discussion

By drawing from Neal and Giffin's safety model (2004), we achieved three primary goals. First, our research examined the enactment of infection control behaviors in a general, non-expert population. Second, the study investigated occupational risk as an under-studied work environment antecedent of safety performance. Third, the findings enhanced the understanding of the relative importance of various individual and organizational antecedents to safety performance. Together, these novel insights contribute to the workplace safety literature and provide practical knowledge to inform intervention in the ongoing pandemic, future health crises, and more generally.

The current work addresses the enactment of safety performance among a general, non-expert population. In contrast to previous safety research that tends to focus on safety behaviors within specific occupations, the COVID-19 pandemic required individuals in almost every occupation to learn and enact infection control behaviors. The descriptive statistics for safety performance indicate that many people routinely enacted these behaviors; on average, individuals reported "often" enacting all of the suggested safety behaviors. An exploration of the specific safety behaviors indicates that people are most likely to enact safety behaviors related to physical contact; they are most likely to avoid physical contact with others (e.g., a handshake or high five) or at least wash/sanitize their hands after engaging with a high touch item. However, individuals were less likely to wear a mask or sanitize the

Table 2
Relative Weights Analysis of Study Variables Predicting Workers' Safety Performance.

	Raw Relative Weight	Rescaled Relative Weight	Confidence Intervals Around Raw Weights		Confidence Interval Tests of Significance	
			Lower	Upper	Lower	Upper
DV: Safety performance						
Perceived safety climate	0.16	31.30	0.06	0.29	0.06	0.30
Safety-related constraints	0.09	16.60	0.02	0.20	0.01	0.21
Occupational risk ¹	0.01	1.12	<0.01	0.03	-0.02	0.05
Safety attitudes	0.08	16.23	0.02	0.17	0.02	0.18
Conscientiousness	0.17	33.50	0.08	0.27	0.08	0.28
Risk aversion	0.01	1.25	< 0.01	0.02	-0.03	0.04
R ²	0.5119					

Notes. N = 89. Confidence intervals that do not include zero are statistically significant.

¹ n = 67.

Table 3
Relative Weights Analysis of All Variables Predicting Workers' Safety Performance.

	Raw Relative Weight	Rescaled Relative Weight	Confidence Intervals Around Raw Weights		Confidence Interval Tests of Significance	
			Lower	Upper	Lower	Upper
DV: Safety performance						
Perceived safety climate	0.16	30.82	0.06	0.29	0.07	0.29
Safety-related constraints	0.08	16.17	0.02	0.20	0.01	0.21
Occupational risk ¹	0.01	0.99	<0.01	0.02	-0.02	0.05
Safety attitudes	0.08	15.89	0.02	0.17	0.02	0.18
Conscientiousness	0.16	30.53	0.08	0.25	0.08	0.26
Risk aversion	0.01	1.19	< 0.01	0.02	-0.02	0.06
Gender	< 0.01	0.32	< 0.01	0.00	-0.02	0.03
Age	0.01	2.76	< 0.01	0.05	-0.01	0.07
Country ²	0.01	1.33	< 0.01	0.05	-0.01	0.08
R ²	0.5159					

Notes. $N = 89$. Confidence intervals that do not include zero are statistically significant.

¹ $n = 67$.

² $n = 88$.

physical items that they touch, such as sanitizing shared equipment or their workspace. However, even the safety performance behaviors that were most rarely enacted (e.g., sanitizing one's workspace) were reported as being enacted fairly frequently (between "sometimes" and often" in the past month). This suggests that, even in a non-expert sample, individuals are reporting fairly consistent and strong safety performance.

This work also addresses the relative importance of the work environment and individual antecedents for understanding individuals' safety performance. The relative weights analysis indicates that the relatively important predictors for safety performance are perceptions of the organization's safety climate, the organization's safety-related constraints, the individual's conscientiousness, and the individual's safety attitudes. These findings replicate previous work indicating that perceived safety climate is regularly a substantive predictor of individuals' safety performance (Beus et al., 2015; Christian et al., 2009; Clarke, 2006; Nahrgang et al., 2011) while extending this work to examine individual's attitudes and personality traits. Even after statistically accounting for the perceived safety climate, individual antecedents predicted substantial, unique variance in infection control safety performance.

4.1. Theoretical implications

This research lends credence to some tenets of Neal and Griffin's theoretical framework of safety behavior (2004). Significant predictors of safety performance were identified associated with the work environment and with the individual. These findings support an underlying premise of the Neal and Griffin model as well as the broader theory that individual behaviors are meaningfully driven by both person and environment factors (Lewin, 1951). Neal and Griffin (2004) further specify that work environment factors include two core components: safety climate and organizational variables; individual factors include individual attitudes and individual differences. Presented findings support the relevance of these factors to safety performance. Though risk aversion and occupational risk of COVID-19 exposure were not significantly associated with safety performance, perceived safety climate, safety-related organizational constraints, infection control safety attitudes, and conscientiousness were significantly associated with safety performance. Together, the predictors accounted for significant variance in infection control safety performance among on-site employees during COVID-19.

The importance of safety climate is supported by social information processing theory (Salancik & Pfeffer, 1978). According to social information processing theory, people are inherently social creatures who rely on social information to form their beliefs and shape their actions (Salancik & Pfeffer, 1978). We found that social information pertaining to safety (i.e., perceived safety climate) explained more variance in

employees' safety behaviors than did a variety of other factors, including individuals' personal infection control safety attitudes and constraints that make it inconvenient to enact safety behaviors. While safety climate is a dominant research area in the occupational safety literature (Clarke, 2006; Zohar, 2010), "much of the work in this field has focused on methodological rather than theoretical or conceptual issues," (Zohar, 2010, p. 1517). The extant literature does not typically discuss safety climate through the lens of social information processing theory (see Zohar, 2010 for a brief exception). Rather, researchers who draw from existing theory to explain safety climate commonly rely on social exchange theory, suggesting that employees who perceive that their organization is concerned for their well-being are more likely to reciprocate by fostering a strong safety climate for the organization (e.g., Hofmann et al., 2003; Neal & Griffin, 2006; Zohar, 2010). Social information processing theory may complement this perspective by providing insights to help understand and explain mechanisms through which safety climate drives safety performance.

4.2. Practical implications

This research has clear practical implications during the COVID-19 pandemic and beyond. During COVID-19, organizations scrambled to enact new or enhanced safety guidelines and promote strong safety performance. Findings of this research highlight the importance of promoting a strong safety climate during critical periods. Safety climate is often described as a top-down process that stems from organizational leaders; indeed, researchers have long claimed that "leaders create climate" (Lewin, 1939; Zohar, 2010, p. 1519). Organizational leaders may have substantial potential to enhance their employees' safety performance by modeling safety behavior, encouraging safe practices, and implementing safety policies (Barling et al., 2002; Clarke, 2013; Hofmann et al., 2003; Sinclair et al., 2020).

Beyond demonstrating the importance of fostering a strong safety climate, our findings suggest specific safety behaviors that may merit particular attention from organizational leadership. Among safety behaviors recommended by the CDC, employees exhibited the poorest compliance with sanitizing work equipment (e.g., keyboards, tables), sanitizing one's workspace, and wearing a mask when unable to be at least six feet away from others. Supervisors may benefit from modeling and encouraging these behaviors, in particular.

Additionally, our findings suggest potential value in considering safety during employee selection. Conscientiousness and individuals' infection control safety attitudes explained substantial variance in their infection control safety performance. While the importance of hiring safety-oriented individuals may be intuitive in high-risk occupations, the pandemic showcased the importance of selecting safety-oriented individuals across occupations.

Although the presented findings are clearly relevant during the

ongoing pandemic, they are also important for the future of work. The potential for diseases to spread is continuously rising due to increased global travel, urbanization, climate change, human-animal contact, and health worker shortages in under-developed countries (Dodds, 2019). Enhancing the understanding of safety performance is critically important to mitigate and effectively respond to dangerous realities going forward.

4.3. Limitations and future directions

Our research demonstrates that some tenets of Neal and Griffin's (2004) model of safety behavior may apply to a general, non-expert population employing new infection control procedures. However, we did not examine Neal and Griffin's full theoretical model. According to the model, individual and environmental factors are thought to relate to employees' safety performance through the acquisition of safety knowledge, skills, and motivation (Campbell et al., 1993; Neal & Griffin, 2004). Future research that includes measures of safety knowledge, skills, and motivation would be beneficial to provide a more comprehensive replication of Neal and Griffin's (2004) model in various contexts. In a similar vein, we did not measure many potential work environment and individual antecedents suggested by Neal and Griffin's (2004) safety model. While the six antecedents we selected accounted for 51.19 percent of the variance in infection control safety behavior, other factors may explain more variance. In future studies, it would be beneficial to capture additional antecedents with high criterion-related validity.

We did not find significant associations between the risk-related variables and infection control safety performance. Findings regarding occupational risk of COVID-19 exposure may be attributed to unreliable measurement. To measure occupational risk, we used COVID-19 occupational risk scores from Lu (2020). These scores were computed based on information from O*NET regarding a number of occupational risk factors (e.g., proximity to other people; Lu, 2020). Within-occupation variability may create substantial error variance at the individual level. For example, two kindergarten teachers may have different levels of COVID-19 exposure risk depending on their class sizes, ventilation systems, geographical location, and available resources. Such "noise" may have attenuated the observed variable relationship in this study. Future research should investigate occupational risk with larger samples of employees to increase statistical power. Risk aversion has received limited research attention in safety performance literature. More research is needed to help determine if our findings regarding risk aversion replicate or may be a type II error. Future research could also include other measures related to risk, such as whether individuals have pre-existing health condition(s) that may influence the severity of COVID-19 symptoms.

During the onset of the COVID-19 pandemic, millions of employees transitioned to remote work. Relatively few employees returned to onsite work during the early stages of the pandemic, which is reflected in our data collection. Only 89 of 232 recruited participants worked onsite during July and August of 2020. The experiences of onsite employees during the early stages of the pandemic were of particular interest because they reflected a dangerous time to be working onsite when safety procedures were universally recommended (i.e., recommendations did not vary by country or vaccination status). Given the relatively low sample size, we ran power analyses to ensure there was adequate statistical power to test our hypotheses and answer our research question. While the power of our analyses was over 0.80, future research with larger samples would be beneficial to enhance confidence in the stability and generalizability of these findings.

Because this research was conducted with the aim of better understanding safety behaviors during the COVID-19 pandemic, some of the findings may be specific to the circumstances of the global health crisis. For example, employees' safety attitudes during COVID-19 may have been unusually variable due to a rise in the spread of misinformation

about the pandemic (Rosenberg et al., 2020). However, the patterns of variable relationships in this research align with research conducted during periods of "normalcy." For example, ample existing research reports a similar relationship between safety climate and safety performance across contexts (Zohar, 2010). This research demonstrates that such findings generalize to a cross-section of industries and a non-expert population during a global pandemic.

Several of the measures used in this research have only been administered to the participants of this study. More evidence regarding the measures' reliability and validity would be beneficial. For example, although the measure of safety performance used in this research had adequate internal consistency reliability, its factorial validity was questionable. More data could be collected to further assess the factor structure of the scale. Additional methods of examining the measures' reliability and validity would also be useful, such as investigating test-retest reliability, convergent validity, and discriminant validity.

The measurement of perceived safety climate is also notable. Safety climate was introduced as a group-level construct consisting of shared perceptions about safety policies, practices, and procedures (Zohar, 1980). To properly measure the construct, many researchers recommend administering self-report measures to a group of employees and aggregating them to multiple levels (e.g., group, organization; Keiser & Payne, 2018). However, safety climate has also been conceptualized and measured at the individual level (i.e., individuals' perceptions of safety climate; Beus et al., 2015; Ostroff et al., 2013). In the current research, we measured individuals' perceptions of safety climate. The distinction is important because the theoretical processes through which individual and organizational level safety climate emerge may differ; their relationships with behaviors and outcomes may also differ (Beus et al., 2010; Kozlowski & Klein, 2000; Ostroff et al., 2013). Another notable aspect of our measure is the dimensions of safety climate that were captured: coworker and supervisor safety. Future research could examine if measuring other dimensions of safety climate, such as safety policies, may influence results.

Some researchers have expressed data quality concerns with data collected from crowdsourcing websites, such as Prolific (Rodd, 2019). To mitigate such concerns, we included attention and comprehension checks during data collection, and we removed participants whose responses were incorrect. Furthermore, because findings in this research closely align with existing research findings (e.g., Zohar, 2010), we have further confidence in the data quality. By using Prolific, we were able to collect a diverse sample of participants spanning countries and occupations during the COVID-19 pandemic.

Because our research design was cross-sectional, causality cannot be determined. Perhaps some of the variables we examined were related due to reverse-causality or third variable explanations. For example, individuals' infection control behaviors may shape their safety attitudes in addition to the reverse. This possibility is suggested by research on cognitive dissonance; people seek consistency in their attitudes and behaviors, and it can be easier to change one's attitudes than behaviors (Festinger, 1957). Experimental or quasi-experimental designs are needed to examine causality (Spector et al., 2019).

Literature on common method bias suggests that researchers should be concerned with "extraneous and unintended systematic influences on a measured variable, some of which might be shared with other measured variables (CMV) and some of which is not (UMV)" (Spector et al., 2019, p. 2). For example, one potential source of bias relevant to survey data is mood (Spector et al., 2019, 2021). Theoretically, employees may report more positive safety attitudes and stronger safety performance when they are in a good mood. Fortunately, empirical research generally finds that controlling for such potential biasing factors does not change the significance of variable relationships (Spector et al., 2021). Future research should continue to investigate potential sources of bias that may influence the measures used in this and other research. However, common method variance should not be assumed simply because this research was cross-sectional self-report (Conway &

Lance, 2010; Spector, 2006).

5. Conclusion

During COVID-19, workplaces were forced to implement critical safety measures without a roadmap. Drawing from the Neal and Griffin model of safety performance, the current research addresses work environment and individual antecedents of infection control safety behaviors. The results indicate that the work environment antecedents of perceived safety climate and safety-related organizational constraints as well as the individual antecedents of conscientiousness and infection control safety attitudes predict unique variance in COVID-19 infection control safety performance. This research provides insights to enhance workplace safety performance during the ongoing pandemic, future health crises, and more generally.

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CRedit authorship contribution statement

Cheryl E. Gray: Writing – original draft, Validation, Methodology, Conceptualization. **Kelsey L. Merlo:** Writing – review & editing, Visualization, Methodology, Funding acquisition, Formal analysis, Conceptualization. **Roxanne C. Lawrence:** Writing – review & editing, Investigation, Formal analysis, Data curation. **Jeremiah Doaty:** Writing – review & editing, Visualization. **Tammy D. Allen:** Writing – review & editing, Funding acquisition.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

The de-identified data and R syntax for this research can be found in a data repository, Open Science Framework: DOI 10.17605/OSF.IO/B3UY4.

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