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Interactive effects of leader justice and support for safety on safety performance

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Abstract

Purpose – The purpose of this paper is to examine the main and interactive effects of general and safety-specific leader justice (SSLJ) (i.e. fair treatment) and leader support for safety (LSS) on safety performance.

Design/methodology/approach – Two independent samples of construction workers rate their leaders with regards to fair treatment and support for safety and report their own safety performance in a survey.

Findings – In both studies, LSS significantly moderated relationships of both general and SSLJ with safety performance. In Study 1, the strength of relationship between general leader justice and safety performance increases while LSS is increased. Similar pattern was found for the relationship between SSLJ and safety performance in Study 2.

Practical implications – Safety interventions targeting leadership should consider training for leader safety practices that are perceived as supportive and fair.

Originality/value – The research is unique in its examination of leader justice in a safety-specific context and its interactive effects with LSS on safety performance. The present research helps to extend the reach of organizational justice theory's nomological network to include safety.

Keywords Justice, Construction, Leadership, Support, Leader, Safety performance, Organization health and wellbeing, Safety behaviours

Paper type Research paper

According to International Labour Standards (2012), there are two million workers losing their lives at work each year, with about 5,500 lives lost per day around the globe. These data in conjunction with recent occupational accidents such as Deepwater Horizon oil spill in 2010 and Costa Concordia disaster in 2012 clearly suggest that occupational safety remains a major concern across industries throughout the world (Chen and Li, 2014). The economic and human costs associated with these negative safety outcomes are significant. ILS has estimated that 4 percent of the world's GDP

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loss is resulted from occupational illness and accidents. The additional cost would be astronomical when financial toll and emotional suffering experienced by the victims and their families are considered (Waehrer *et al.*, 2007).

In response to the substantial toll that occupational injuries and illnesses take on individuals, organizations, and societies, researchers have invested significant efforts to improve workers' safety performance (Christian *et al.*, 2009; Griffin and Neal, 2000; Nahrgang *et al.*, 2011). Safety performance refers to "actions or behaviors that individuals exhibit in almost all jobs to promote the health and safety of workers, clients, the public, and the environment" (Burke *et al.*, 2002, p. 432). Safety performance is considered a critical aspect of job performance in many occupations and industries, and has been considered a direct predictor of occupational accidents and injuries (Neal and Griffin, 2004). Two recent meta-analytic studies have supported this assertion. Christian *et al.* (2009) reported a significant negative correlation ($r_c = -0.31$) between safety performance and accidents/injuries, while Nahrgang *et al.*'s (2011) meta-analysis found a significant positive relationship ($r_c = 0.24$) between unsafe behaviors and accidents/injuries. Because of its central role in predicting safety outcomes, safety performance has become a key target for interventions aimed to reduce and prevent adverse safety events.

Although traditional accident prevention interventions have focussed on improving workplace safety through industry regulations and technology, recent research indicates that organizational factors such as climate and leadership may play important roles to influence safety performance and outcomes (Christian *et al.*, 2009; Nahrgang *et al.*, 2011; Zohar, 2002a, b). While leadership has been identified as a critical factor in shaping occupational safety (Neal and Griffin, 2004; Zohar, 2011), there is a need to elucidate specific aspects of leadership that have bearing on worker safety performance, which will inform organizational practices and intervention efforts (Zohar and Polachek, 2013). Thus, the current study extends the safety performance literature by focussing on two such factors, leader justice (Colquitt, 2001) and leader support for safety (LSS) (Hofmann and Morgeson, 1999), with the foci on their main and interactive effects on safety performance.

Leader justice refers to employee perceptions how well leaders enforce organizational policies and procedures justly and consistently, treat employees kindly and respectfully, and provide them with sufficient information for achieving performance goals (Colquitt, 2001). Results from several meta-analytic studies have demonstrated significant, positive effects of leader justice on both task and contextual job performance (Cohen-Charash and Spector, 2001; Colquitt *et al.*, 2001). However, only two studies, thus far, have investigated the relationship between leader justice and employee safety performance (e.g. Gatién, 2010; Thompson *et al.*, 1998). While the initial evidence from these studies suggests that leader justice may be positively related to safety performance, this underlying mechanisms of the relationship remain relatively unexplored. Furthermore, no study to date has examined the effects of safety-specific leader justice (SSLJ) on employee safety performance.

In the safety context, LSS (i.e. to what extent leader values safety, gives priority to safety over competing interests, and corroborates these attitudes with proactive and reactive safety-related actions) also play an important role (Neal and Griffin, 2006). Past meta-analysis shows that leaders who support safety may have positive effects on employees' safety behaviors and outcomes (Christian *et al.*, 2009). It has also been suggested that effective leaders, who also prioritize safety, may have a stronger effect on safety outcomes than effective leaders with low safety priority (Zohar, 2002a, b).

Consequently, when safety goals clash with other performance goals such as speed or productivity, the positive effects of general (i.e. non-safety-specific) leader justice on employee safety performance may be further strengthened when leaders are explicitly supportive of safety. However, this enhancing, moderation effect of LSS may not be as pronounced with regards to SSLJ.

The two studies reported herein contribute to the current occupational safety literature by examining the interactive effects of leader justice and LSS on employee safety performance, as well as by uniquely operationalizing leader justice in the safety context. More specifically, we examined in Study 1 the effect of general leader justice (GLJ) on employee safety performance and the moderating role of LSS. In Study 2, we investigated how changing the operationalization of leader justice from “general” to “safety-specific” affected its relationship with employee safety performance, and how this relationship was moderated by LSS.

Background

Safety performance

Griffin and Neal (2000) have classified safety performance into safety compliance and safety participation. Safety compliance refers to mandated safety behaviors such as obeying safety regulations, following procedures correctly, and using designated equipment properly, whereas safety participation represents voluntary safety behaviors, which do not directly enhance personal safety but instead support and improve general safety in the workplace.

Logically, partaking in safety behaviors should minimize workplace injury because employees will be following safe work processes prescribed by safety policies and procedures, be wearing and using protective equipment properly, and be conscientious and proactive about safety in their workspace. Several meta-analytic studies have consistently demonstrated that high safety performance was related to fewer accidents and injuries (Clarke, 2010; Christian *et al.*, 2009; Nahrgang *et al.*, 2011). Clarke found safety behaviors to be significantly related to accidents ($r_c = -0.17$), while Christian *et al.* found that safety performance, operationalized as a combination of safety compliance and participation, significantly predicted accidents and injuries ($r_c = -0.31$). Similarly, Nahrgang *et al.* revealed a similar result ($r_c = -0.24$). Taken together, these meta-analytic results demonstrate that the safety performance plays an important role to prevent accident and injury.

Leader justice and safety performance

While talking about fair treatment of leaders, employees tend to evaluate four types of leaders' actions (Colquitt *et al.*, 2001; Cropanzano *et al.*, 2002): how outcomes are distributed to employees by their leaders (distributive justice), how formal policies or processes are executed by leaders regarding allocation of outcomes are allocated (procedural justice), how leaders explains their rationales why they follow certain procedures in action and/or how they distribute outcomes to employees (informational justice), and the interpersonal treatment employees receive from their leaders (interactional justice). Because the source of distributive justice tend to be related to the organization rather than the leader or immediate supervisors (Rupp and Cropanzano, 2002), the present study will not focus on distributive justice.

Leader procedural justice refers to employees perceptions of whether their leader has enacted fair processes when enforcing organizational policies and procedures (Leventhal, 1980). Social exchange theory (Blau, 1964) suggests that employees will feel

the need to reciprocate fair implementation of organizational policies in order to maintain their social exchange relationship with their leader (McNeely and Meglino, 1994). Blader and Tyler (2005) note that the party on the receiving end of positive action in social exchange relationships will experience feelings of indebtedness which can only be assuaged through positive behavioral reciprocation. In settings where safety is viewed as a tangible performance outcome, employees experiencing high leader procedural justice may leverage their safety behaviors as a form of reciprocation. Since safety performance is associated with reduced accidents and injuries (Christian *et al.*, 2009; Clarke, 2010), and the latter has been demonstrated to negatively impact the organization's bottom line (i.e. workers compensation payments, lost productivity, etc.), increases in safety performance is likely to reflect positively on the leader via improvement of workgroup outcomes (Hofmann and Morgeson, 1999). As the result, employees tend to comply with safety policies and procedures and proactively monitor safety of the workspace to alleviate their feelings of indebtedness (Hofmann and Morgeson, 1999).

Leader informational justice is about how well leader adequately present explanations or rationale for work-related decisions or actions to employees (Colquitt *et al.*, 2001). Similar to leader procedural justice, high leader informational justice is likely to be viewed by the employee as an act worthy of reciprocation and employees may choose to "repay" their leader by increasing their safety performance. This line of reasoning is supported by research demonstrating that properly informed employees are likely to feel cared for by their leader, and experience obligations to return their leaders concern (Lavelle *et al.*, 2007). In the safety context, it is conceivable that employees reciprocate leader informational justice by engaging safety behaviors.

Leader interactional justice reflects employee evaluation of their interactions with their leader when the leader is either informing or enforcing an organizational-related decision (Greenberg, 1993). Employee perceptions of leader interactional justice are fostered when leaders treat employees with respect, dignity, or concern when enforcing managerial decisions, all of which are characteristics of high interpersonal consideration. Leaders who exhibit leader interactional justice motivate employees to engage safety behaviors and employees regard their behaviors as a means of reciprocating leaders' concern (Blader and Tyler, 2005).

In the only empirical investigation of the relationship between leader justice and safety performance to date, Gatien (2010) found significant positive correlations of procedural, informational, and interactional justice with safety performance across two independent samples. Following the above reasoning, we expect that employees who perceive high GLJ will be intrinsically motivated to "repay" their leader by increasing their safety compliance and safety participation behaviors:

- H1.* Leader justice (procedural, informational, and interactional) will be positively related to safety performance.

In addition to the leader justice described above, there is a utility to consider SSLJ to advance safety literature. Safety-specific leader procedural justice is conceptualized as employees' perceptions of whether their leader is enacting fair processes when enforcing organizational safety policies and procedures (Leventhal, 1980). It is likely that safety-specific leader procedural justice will be of greater relevance to safety performance than its general leader procedural justice because it explicitly signals to employees to engage safety behaviors to satisfy their social exchange obligations.

Additionally, employees experiencing high safety-specific leader informational justice may receive adequate explanations or rationale for safety-related decisions or actions. Given the criticality of safety knowledge and safety communication for safety performance and outcomes (Christian *et al.*, 2009), the argument that safety-specific leader informational justice will have an impact on safety performance is perhaps the most compelling among all justice dimensions.

Safety-specific leader interactional justice reflects the employees' perceptions of their interactions with their leader when the leader is either informing or enforcing a safety-related decision. High SSLJ is engendered when employees perceive their leader as treating them with dignity and respect during the enforcement, implementation, or provision of a safety-related decision. According to social exchange framework, interactional treatment by a fair, personalized, and respectful safety-oriented leader should oblige employees to reciprocate by performing tasks in safe manner (Barling *et al.*, 2002):

H2. SSLJ (procedural, informational, and interactional) will be positively related to safety performance.

While considering the safety context, we argue that SSLJ will exhibit stronger effects on safety performance than GLJ. Two streams of research lend credence to this assertion. First, predictive validity tends to be improved when predictors are matched on nature and specificity with the criterion they purport to be related to (Hogan and Roberts, 1996). Therefore, operationalizing leader justice in safety-specific terms when studying its effects on safety performance mitigates potential cross-context measurement issues.

Second, research by Zohar (2002b) and Hofmann *et al.* (2003) advocate the utility of matching constructs' specificity levels. Leader's exhibition of high SSLJ signals to employees that safety is a valued commodity and that their behavioral "repayment" to the leader should also be within the safety context. For example, when a construction worker perceives that their leader was fair in enforcing a safety-related policy or procedure, the safety context of the interaction has already been framed. Consequently, the worker is presented with the specific realm for which their reciprocation should reside, i.e. safety. For the reasons stated above, it is hypothesized that:

H3. SSLJ will exhibit stronger relationships with safety performance than GLJ.

LSS and safety performance

Neal and Griffin (2004) define LSS as "the extent to which [leaders] are perceived to place a high priority on safety, respond to safety concerns, and provide support and encouragement for subordinates who comply with safety procedures and participate in safety activities" (p. 27). It can be argued that LSS affects employee safety performance by prioritizing safety over competing goals, fostering employee safety communication and safety commitment, and supporting and encouraging employees to adhere to safety mandates and participate in extra safety activities (Hofmann and Morgeson, 1999; Zohar, 2002a). Leaders high in LSS signal to their employees the exact performance domain (i.e. safety) for which incremental performance will serve as social exchange capital (McNeely and Meglino, 1994). Specifically, employees can repay their leader's support for safety by fulfilling their obligations of complying with safety rules and proactively monitoring safety in the workplace (Hofmann and Morgeson, 1999).

Research supports the link between LSS and safety performance (Christian *et al.*, 2009). In their meta-analysis, Christian and colleagues found a significant, positive correlation between LSS and safety performance ($r_c = 0.38$) based on nine independent effect sizes. Consequently, we expect that employees who perceive their leaders to be supportive of safety will be more likely to exhibit higher safety performance:

H4. LSS will be positively related to safety performance.

The moderating role of LSS

Perhaps the most persuasive justification for a synergistic (enhancing) interaction between GLJ and LSS stems from Zohar's (2002a) discernment between facet-free and facet-specific leadership. Zohar describes facet-free leadership as leadership perspectives that do not prioritize specific goals but instead attempt to obtain a global homeostasis among all objectives. GLJ is representative of this type of leadership since it does not attempt to emphasize safety over productivity, or visa-versa. In other words, a leader rated highly as generally fair may or may not prioritize safety at work. Zohar postulates that in facet-specific leadership "supervisors more closely monitor certain performance aspects" (p. 157) and adjust rewards and consequences in accordance with the priority emphasized. LSS epitomizes Zohar's conceptualization of facet-specific leadership because leaders high in LSS prioritize safety over all other goals. In this vein, LSS is imbedded within the safety context and is a direct representation of the leader's tendency to prioritize safety over competing goals. Thus, LSS is likely to enhance the positive effects of GLJ on safety by giving safety more weight in justice-related decisions, producing a synergistic interaction effect of these variables on employee safety performance. In light of the above, we hypothesized that:

H5. LSS will moderate the relationship between GLJ and safety performance, so that this relationship will be stronger under high LSS.

While the postulation that the relationship between GLJ and safety performance will be moderated by LSS is more straightforward, we believe that LSS will exhibit a similar, albeit weaker interaction effect with SSLJ. Although SSLJ contextualizes leader justice within the boundaries of safety, it is likely that LSS will further enhance its relationship with safety performance because LSS directly emphasizes safety prioritization (Zohar, 2002b). However, unlike with GLJ, where LSS is necessary for the proliferation of a safety-first environment, the added safety focus of LSS is less pronounced in the presence of SSLJ. If leader justice is operationalized in a safety-specific form (i.e. SSLJ), then LSS plays less of a signaling role in providing direction for the context in which employees can reciprocate.

Given these arguments, we expect that SSLJ will exhibit a significant, but weaker interaction with LSS in predicting safety performance:

H6. LSS will moderate the relationship between SSLJ and safety performance, so that this relationship will be stronger under high LSS.

H7. LSS will interact more strongly with GLJ than with SSLJ in predicting safety performance.

Study 1

Study 1 aimed to investigate if the prediction of safety performance by GLJ was conditional upon the level of LSS experienced by employees.

Method

Participants. In total, 422 workers from Plumbing and Pipefitting Locals in Colorado, Oregon, and Illinois, USA, were invited to participate an anonymous survey, and 249 completed the survey yielding a 59 percent response rate. Among them, 41 percent are journeymen and 59 percent are apprentices. Participants, on average, were 35 years old ($SD = 11.83$), were 97 percent male, and 82 percent were Caucasian, had an average tenure with their current leader of 2.56 years ($SD = 2.58$).

Procedure. Data were collected via mailed surveys and on-site surveys whatever was appropriate. For the mail survey, the survey packets including a cover letter and a self-addressed reply envelope were mailed to above Locals. Two subsequent post-cards were sent out at two and four week intervals after the initial survey packet was mailed. On-site surveys were conducted at all three Local training centers, and were proctored by the research team. Before proctoring the survey, the researchers introduced the goal of the research project, and assured anonymity of their participation. The survey was then proctored and collected.

Measures. Safety performance was assessed by Neal and Griffin's (2006) subscales, safety compliance and safety participation. Both safety compliance ($\alpha = 0.81$) and safety participation ($\alpha = 0.79$) scales contain three items, with five response categories, ranging from 1 (strongly disagree) to 5 (strongly agree).

GLJ was measured by 11 items from Colquitt (2001) to assess procedural, informational, and interactional GLJ. Five items assessed procedural justice ($\alpha = 0.91$; to what extent has your current, immediate supervisor collected accurate information before making a decision?), four items reflected informational justice ($\alpha = 0.87$; to what extent has your current, immediate supervisor communicated details about work procedures and tasks in a timely manner?), and two items evaluated interpersonal justice ($\alpha = .93$; to what extent has your current, immediate supervisor treated you with dignity and respect?). For each item, participants were asked to rate their supervisors on a scale from 1 (to a small extent) to 5 (to a large extent).

Three-item LSS were modified based on Neal and Griffin's (2006) measure of management support for safety. Specifically, the word management in the original scale was replaced with current, immediate supervisor. The internal consistency reliability of the scale was 0.94 (at my current workplace my current, immediate supervisor places a strong emphasis on workplace health and safety). Possible responses ranged from 1 (strongly disagree) to 5 (strongly agree).

Participants were also asked to provide their age, as well as information on background variables including the participant's professional role (apprentice or journeyman), Local union, their tenure with their current supervisor, and their supervisors official job position title. Preliminary correlational and regression analyses indicated that only age was a significant predictor of safety performance, and thus was included as a covariate in the subsequent SEM analyses.

Results

Preliminary results. Descriptive statistics and intercorrelations among observed and latent variables are presented in Table I. All missing data, confirmatory factor analysis (CFA), and structural analyses were conducted using Mplus Version 7 (Muthen and

Muthen, 1998-2012). Missing data, which were determined to be missing completely at random (MCAR) following guidelines by Tabachnick and Fidell (2007), were replaced using full-information maximum likelihood estimation procedures (Schafer and Graham, 2002). Model fit in subsequent CFA and structural analyses was assessed by examining the model chi-square, comparative fit index, standardized root mean square residual (SRMR), and root mean square error of approximation (RMSEA), following recommendations from the literature (Hu and Bentler, 1998).

Prior to examining the hypotheses, CFA was conducted to examine a three-factor measurement model: GLJ (consisting of three indicators: procedural leader justice, informational leader justice, and interpersonal leader justice), LSS (consisting of three indicators: three scale items), and safety performance (consisting of two indicators: safety compliance and safety participation). The results suggest a good fit of the three-factor measurement model, $\chi^2(22) = 39.66$, $p = 0.012$; CFI = 0.987; SRMR = 0.031; RMSEA = 0.058, 90 percent CI [0.027, 0.086].

Hypotheses testing. *H1* and *H4* stated that GLJ and LSS would each be positively related to safety performance. To evaluate these hypotheses, safety performance was regressed on GLJ, LSS, and the observed covariate, age in a latent structural model. Overall, the model fits the data well, $\chi^2(22) = 39.66$, $p = 0.012$; CFI = 0.987; SRMR = 0.031; RMSEA = 0.058, 90 percent CI [0.027, 0.086]. Although observed ($r = 0.23$) and latent ($r = 0.27$) zero-order correlations between GLJ and safety performance were significant (see Table I), structural path coefficients showed that GLJ was not a significant predictor of safety performance, which fail to support *H1*. As expected, LSS was found to exert a positive effect on safety performance as evidenced by significant observed and latent zero-order correlations ($r = 0.54$ and $r = 0.42$, respectively), as well as a significant structural path coefficient ($\beta = 0.57$, $p < 0.001$), supporting *H4*.

To test the moderation hypothesis (i.e. *H5*), we followed the approach incorporated into Mplus (Muthen and Muthen, 1998-2012), which estimated interaction effects between continuous latent variables using full-information maximum likelihood estimation with robust standard errors and a numerical integration algorithm (Klein and Moosbrugger, 2000). This approach is easier to implement than many alternative approaches, which require nonlinear constraints (Marsh *et al.*, 2004). A latent variable interaction model was specified to estimate the moderation effect of LSS on the relationship between GLJ and safety performance (depicted in Figure 1). Specifically, safety performance was regressed onto GLJ, LSS, and age, and the latent interaction term between GLJ and LSS. Results revealed a significant interaction effect, ($B = 0.112$, $SE = 0.040$, $p < 0.001$), indicating that the effect of GLJ on safety performance was moderated by LSS in support of *H5*.

Variable	Mean observed (Latent)	SD observed (Latent)	1	2	3	4
1. Age	34.34	11.59	–	0.086	0.090	0.265**
2. General leader justice	3.58 (0.265)	0.935 (0.897)	0.100	–	0.558**	0.230**
3. Leader support for safety	4.13 (0.261)	0.816 (0.915)	0.096	0.563**	–	0.418**
4. Safety performance	3.99 (0.407)	0.581 (0.521)	0.264**	0.265**	0.544**	–

Notes: Latent means, latent standard deviations, and latent variable intercorrelations were estimated based on maximum likelihood with robust standard errors. Observed variable intercorrelations appear above and latent variable intercorrelations appear below the diagonal. ** $p < 0.01$

Table I. Descriptive statistics and intercorrelations among observed and latent variables in study 1

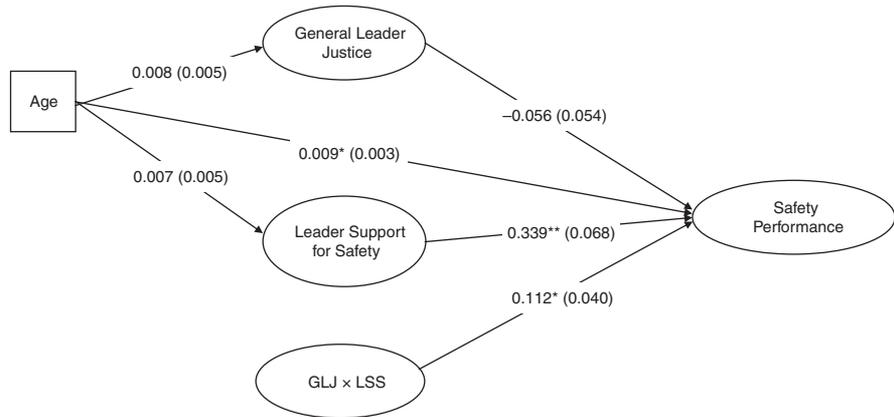


Figure 1. Results of moderation effects in the latent structural model in Study 1

Notes: GLJ, general leader justice; LSS, leader support for safety. Standard errors are reported in the parentheses. * $p < 0.01$; ** $p < 0.001$

To investigate how the relationship between GLJ and safety performance differed depending on level of LSS, a simple slope analysis using standardized path coefficients was conducted. As seen in Figure 2, the positive relationship between GLJ and safety performance gradually reduces and disappears while LSS start to be decrease. Specifically, when LSS is high, the relationship between GLJ and safety performance is positive ($\beta = 0.108, t(239) = 4.582, p < 0.001$). In contrast, the relationship between GLJ and safety performance becomes negative ($\beta = -0.370, t(239) = -6.151, p < 0.001$) when LSS is low.

Study 2

In Study 2, we investigated the relationship between SSLJ and safety performance and the moderating effect of LSS.

Method

Participants. An independent sample of construction workers participated in Study 2. They are also members of the same three US. Locals described above. In total, 230 of the 415 surveys distributed were returned resulting in a response rate of 56 percent.

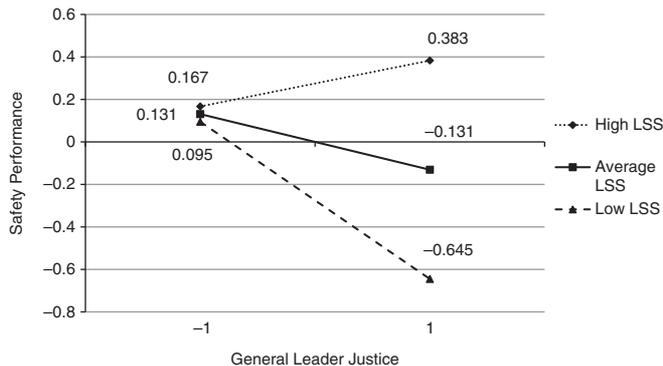


Figure 2. Conditional standardized effects of general leader justice on safety performance at one standard deviation above the mean, at the mean, and one standard deviation below the mean of leader support for safety

In total, 96 percent of participants were male, 83 percent described themselves as Caucasian, and their mean age was just under 35 years old ($SD = 11.90$). Participants, on average, reported having just over three years tenure with their current supervisor ($M = 3.12$, $SD = 5.13$), and 61 percent of the sample were apprentices (39 percent were journeymen).

Measures. Except for items for SSLJ, demographic and background questions, as well as measures in Study 2 are identical as in Study 1, safety compliance ($\alpha = 0.89$), safety participation ($\alpha = 0.83$), and LSS ($\alpha = 0.92$). To assess SSLJ, safety-specific language was infused into the 11 items leader justice measures employed in Study 1, safety-specific leader procedural ($\alpha = 0.91$; to what extent has your current, immediate supervisor collected accurate information before deciding how to handle a worker's safety violation?), informational ($\alpha = 0.89$; to what extent has your current, immediate supervisor communicated details about safety rules and procedures in a timely manner?), and interactional ($\alpha = 0.83$; to what extent has your current, immediate supervisor treated you with dignity and respect when discussing your safety performance?) justices. All response categories for the measures in Study 2 are the same as the correspondent measures in Study 1.

Results

Preliminary results. Observed and latent descriptive statistics as well as internal consistency reliabilities can be found in Table II. The same analytic strategies as presented in Study 1 were employed to analyze Study 2 data.

Similar to Study 1, we tested the fit of the three-factor measurement model, which included SSLJ, LSS, and safety performance (age was excluded as a covariate due to nonsignificant relationship with safety performance). Results indicated that this model closely fit the data, $\chi^2(17) = 19.95$, $p = 0.277$; CFI = 0.997; SRMR = 0.019; RMSEA = 0.027, 90 percent CI [0.000, 0.067], supporting the use of this factor structure for testing hypotheses.

Hypotheses testing. A latent structural model in which safety performance was first regressed on SSLJ and LSS was tested to evaluate $H2$ and $H4$, predicting that SSLJ and LSS would be positively related to safety performance, respectively. This structural model exhibited good model fit, $\chi^2(17) = 19.95$, $p = 0.277$; CFI = 0.997; SRMR = 0.019; RMSEA = 0.027, 90 percent CI [0.000, 0.067]. Path coefficients indicated that SSLJ was not a significant predictor of safety performance, even though observed ($r = 0.42$) and latent ($r = 0.47$) zero-order correlations were significant (see Table II). LSS positively predicted safety performance, $\beta = 0.65$, $SE = 0.104$, $p < 0.001$. Thus, results support for $H4$ but not for $H2$.

Variable	Mean observed (Latent)	SD observed (Latent)	1	2	3	4
1. Age	34.06	11.47	–	0.022	0.102	0.107
2. Safety-specific leader justice	3.46 (0.046)	1.065 (1.058)	0.014	–	0.604**	0.422**
3. Leader support for safety	4.04 (0.287)	0.868 (0.979)	0.098	0.648**	–	0.602**
4. Safety performance	3.96 (0.175)	0.769 (2.427)	0.077	0.468**	0.680**	–

Notes: Latent means, latent standard deviations, and latent variable intercorrelations were estimated based on maximum likelihood with robust standard errors. Observed variable intercorrelations appear above and latent variable intercorrelations appear below the diagonal. ** $p < 0.01$

Table II. Descriptive statistics, and intercorrelations among observed and latent variables in study 2

A latent variable interaction model was specified to test *H6*, which predicted that LSS would moderate the relationship between SSLJ and safety performance. Operationally, safety performance was regressed on SSLJ, LSS, and their latent interaction term. In support of *H6*, a significant interaction effect was detected ($B = 0.100$, $SE = 0.048$, $p < 0.001$) as shown in Figure 3, indicating that the relationship between SSLJ and safety performance was moderated by LSS.

The significant interaction effect was probed via simple slope analysis using standardized path coefficients to elucidate the nature of the moderating effect of LSS on the relationship between SSLJ and safety performance. As shown in Figure 4, the patterns are similar to those depicted in Figure 2. Under the high level of LSS, the relationship between SSLJ and safety performance is significantly positive ($\beta = 0.561$, $SE = 0.068$, $t(241) = 8.246$, $p < 0.001$). While the level of LSS starts to decrease, the relationship between SSLJ and safety performance become weaken ranging from $\beta = 0.188$ ($SE = 0.022$, $t(241) = 8.726$, $p < 0.001$) at the mean level, and to $\beta = -0.184$ ($SE = 0.030$, $t(241) = -6.146$, $p < 0.001$) at the low level. Overall, the interaction pattern supports *H6*.

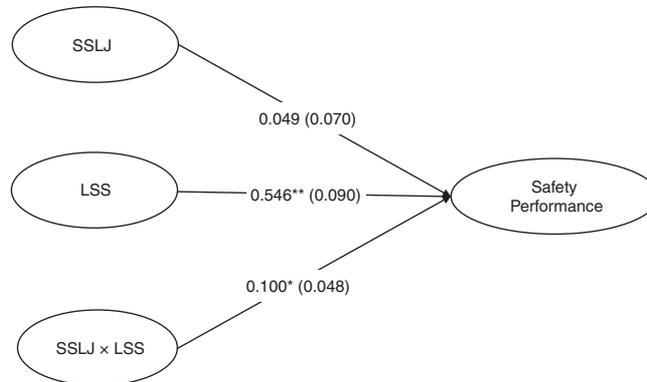


Figure 3. Results of moderation effects in the latent structural model in Study 2

Notes: SSLJ, safety-specific leader justice; LSS, leader support for safety; Safety, safety performance. * $p < 0.05$; ** $p < 0.001$

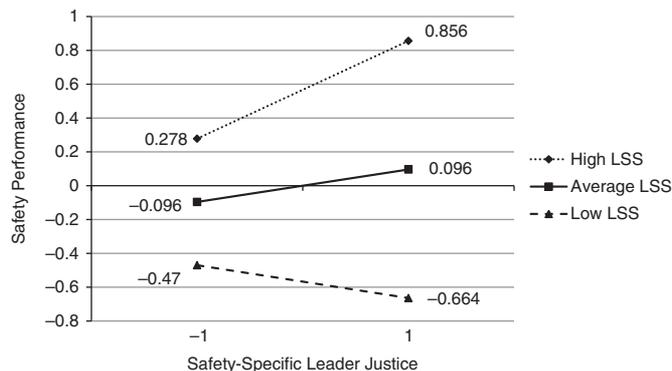


Figure 4. Conditional standardized effects of safety-specific leader justice on safety performance at one standard deviation above the mean, at the mean, and one standard deviation below the mean of leader support for safety

H3 and *H7* predicted differential effects depending on whether leader justice was operationalized in general versus safety-specific terms. Specifically, *H3* predicted that SSLJ would exhibit stronger relationships with safety performance than GLJ. Independent observed and latent correlations were compared (Preacher, 2002), and the results indicated that SSLJ was more strongly related to safety performance than GLJ at both the observed ($z = 2.351$, $p = 0.009$) and latent ($z = 2.569$, $p = 0.005$) levels, supporting *H3*.

H7 predicts that LSS interacts more strongly with GLJ than with SSLJ in predicting safety performance. To examine this hypothesis, we compared the interaction path coefficients reported in Figure 2 ($\beta = 0.112$, $SE = 0.040$) and Figure 4 ($\beta = 0.100$, $SE = 0.048$). Following the procedure suggested by Paternoster *et al.* (1998), we failed to find the significant results between the path coefficients ($z = 0.192$, ns). Thus, *H7* is not supported.

Discussion

Given the dearth of research on the role of leader justice in occupational safety, the two studies reported herein contribute to the safety performance literature in several ways. First, we extend the initial research (Gatien, 2010) by examining the effects of GLJ on safety performance in Study 1. Second, Study 2 offers a first test of the utility of studying leader justice operationalized in safety-specific terms. More specifically, we evaluate the effects of SSLJ on safety performance. And third, we demonstrate in both studies the significant moderation effects of LSS on the relationships of GLJ and SSLJ with safety performance, thus making strides to better understand how leader justice may affect occupational safety.

As hypothesized, LSS was positively related to safety performance (*H4*), which is in line with prior work contending that the overt verbal and behavioral support for safety by leaders is a powerful tool for encouraging mandatory and extra-role safety behaviors (Zohar, 2002a). Further, SSLJ exhibited stronger relationships with safety performance than GLJ (*H3*). This finding echoes the analytical utility of matching the context and specificity of the predictor with the criterion (Cronbach, 1970), as also observed by Mullen and Kelloway (2009) who found that safety-specific transformational leadership was more predictive of safety-related events and injuries, than general transformational leadership.

Additionally, we found that LSS moderated the effects of GLJ and SSLJ on safety performance (*H5* and *H6*, respectively). Specifically, GLJ had a weak effect on employees' safety performance when employees perceived their leaders to be unsupportive of safety. Only when workers perceived their leader to be highly supportive of their safety, GLJ was associated with a positive behavioral safety response from employees. This moderation pattern was generally consistent with the interactive effect of SSLJ and LSS on safety performance.

Contrary to our expectations set by *H1* and *H2*, GLJ and SSLJ were not associated with safety performance in the structural models, even though both had significant and positive correlations with safety performance as shown in Tables I and II. The inconsistent patterns may likely be attributed to the moderate to high correlations of LSS and interaction terms with GLJ and SSLJ. A similarly inconsistent finding was also observed by Gatien (2010), who found significant bivariate relationships between all GLJ dimensions and safety performance across two studies, but her structural model results revealed that the effects of the general justice dimensions on safety performance were mostly indirect and mediated by safety climate, if significant

at all. Given that recent meta-analytic results pinned social exchange indicators such as trust, commitment, and LMX as mediators of the relations between justice dimensions and task performance and OCBs (Colquitt *et al.*, 2013), it is possible that such more proximal variables mediate the effects of leader justice on safety performance.

Overall, the results suggest that by exhibiting strong support for safety, leaders can augment the effects of their fair treatment on employee safety performance. This is consistent with Zohar (2002a) and Hofmann *et al.* (2003), who found effects of transformational and contingent reward leadership and LMX to be enhanced when leader safety prioritization and perceptions of safety climate were high, respectively. However, unlike previous studies, which found null effects of their leadership variables when their safety moderator (e.g. safety prioritization; safety climate) was low, our current investigations showed that leader justice, irrespective of context, was associated with lower safety performance when leaders were unsupportive of safety.

Theoretical and research implications. The present research helps to extend the reach of organizational justice theory's nomological network to include safety. Specifically, our findings deepen our understanding of the relationship between leader justice and employee safety performance by examining main as well as interactive effects in both general and safety-specific contexts. The significant, positive zero-order correlations of GLJ and SSLJ with safety performance suggest that leader justice is a factor in maintaining and promoting employees' safety behaviors. More importantly, the higher correlation of SSLJ with safety performance compared to that of GLJ underscores the importance of contextualizing leadership variables to the domain of interest. Our findings add support to the paradigm that predictive validity is maximized when predictors and criteria are matched according to their domain and level of specificity is supported in the current investigations (Cronbach, 1970).

These studies also clarify contemporary justice measurement topics by demonstrating the efficacy of overall leader justice, and safety-contextualized overall leader justice, in predicting relevant work outcomes. Operationalizing leader justice in safety terms may pay dividends beyond the scope of safety performance. For instance, underreporting of work-related injuries, which is a rampant problem in industries such as construction and health care (Moore *et al.*, 2013; Probst *et al.*, 2008), may be mitigated when workers perceive their leaders to be fair in dealing with safety-related issues and decisions. In fact, Wiener *et al.* (2008) suggest that level of organizational justice plays an integral role in determining the likelihood of reporting patient-related safety incidents in health care. In turn, exploring whether SSLJ impacts employees' propensity to report injuries may be a fruitful area for further research.

Our findings also highlight the critical role of LSS and the manner in which it interacts with facet-free (i.e. GLJ) and facet-specific (i.e. SSLJ) leader justice to predict safety performance. The pattern of findings emerging from the two studies suggests that the level of LSS determines the magnitude of the relationship between leader justice and safety performance and that the effects of positive leader justice (both general and safety-specific) are not enough to promote safety behaviors when LSS is lacking, as illustrated in Figures 2 and 4. These findings are in unison with Zohar's (2002b) claim that positive effects of facet-free leadership on specific performance domains may be best realized under conditions in which leaders explicitly express that the respective performance domain (i.e. safety) is valued. Future research should continue to explore the interactive effects of leader variables across contexts and facet-levels to further develop our understanding of their interactive effects on performance.

The current studies also demonstrate the utility of examining interaction effects at the latent variable level when studying topics related to occupational health and safety. It has been long-acknowledged that estimating interactive effects using observed variables is inferior to latent variable estimation because the former suffers from measurement error which leads to low power and biasing of regression coefficients (Barron and Kenny, 1986; Busemeyer and Jones, 1983; Kline, 2011). Historically, advantages offered by modeling interactions at the latent level have been offset because of inherent problems in model specification and difficulty in deciding how to specify indicators (Marsh *et al.*, 2004). However, software advancements in recent years have mitigated such limitations. Given that interactive effects are commonly hypothesized and tested in the field of occupational health psychology (for a review see Sonnentag and Frese, 2013), it is somewhat disappointing to note that estimating latent interactions has remained off limits among occupational health and safety researchers. Thus, we implore that future tests of moderation effects be conducted at the latent variable level in order to best inform our understanding of dynamic and conditional relationships among leadership constructs.

Practical implications. Our results indicate that leader justice affords an opportunity for enhancing worker safety performance in high-risk industries (e.g. construction) where accidents and injuries are major concerns. Specifically, organizations may improve employee safety by: hiring or promoting leaders who demonstrate a disposition toward treating their employees fairly, and by training leaders to treat employees respectfully, to inform them accurately and in a timely manner, and to enact policies and procedures correctly when issuing organizationally relevant decisions. However, the findings also suggest that cultivating GLJ may not be sufficient in and of itself to encourage safety behaviors in settings where safety may compete with production goals, as is often the case in high-risk industries. Instead, engendering leader behaviors that support and promote safety should take precedence when employee safety is of concern. This assertion is supported by our results showing that SSLJ was more strongly related to safety performance than GLJ, and by the significant moderating role of LSS within the leader justice-safety performance relationship.

Although leader justice may provide one avenue for improving worker safety, we found that safety performance may be leveraged to a greater extent by targeting LSS. This point is emphasized by present results showing that the positive effect of leader justice on safety performance was only realized when leaders supported workplace safety; a finding that exemplifies the context prioritization qualities of the facet-specific leadership variable (Zohar, 2002a). This finding bears practical significance for organizations, which may be able to extend the reach of general leadership development programs (not exclusive to leader justice) into the safety realm by training leaders to actively and verbally support safety.

Studies by Kelloway and his colleagues underscore the benefits for organizations of targeting safety-specific leadership variables rather than their general manifestations for improving safety outcomes. Explicitly, they showed that safety-specific variables accounted for incremental variance (Kelloway *et al.*, 2006) and were more efficacious in increasing safety when operationalized in trainings compared to their facet-free equivalents (Mullen and Kelloway, 2009). Based on this evidence, it would behoove safety practitioners to consider SSLJ, and especially LSS, rather than GLJ when designing training programs aimed at increasing worker compliance with safety protocol and/or proactive safety behaviors.

Limitations. It is important to acknowledge that all research is accompanied by certain limitations which may influence results and subsequent conclusions. The studies presented here are no exception. One such limitation of the current research is common method variance (CMV), which may be introduced when responses to all measures are provided by the same source and are in self-report format as is the case in our studies (Podsakoff *et al.*, 2003). Consequence of CMV may be inflation of relationships among variables (Podsakoff *et al.*). While historically the presiding paradigm has been that CMV is pervasive across all same-source and self-report data, more recently it has been suggested that CMV is a problem idiosyncratic to the study rather than an omnipresent issue (Meade *et al.*, 2007; Spector, 2006). Despite concerns, certain results of the present studies indicated that CMV was unlikely to account for all of our findings. For example, correlations between predictors and criteria were of the low to moderate variety and within the same range found by Gatien (2010). CFA also indicated that all measures assessed distinct factors, despite close conceptual relations.

The cross-sectional design of the current studies represents an additional limitation. Specifically, since criteria and predictor data were collected at the same time point, causal inferences from results are inappropriate. Additionally, although the directionality of relationships was hypothesized and results were interpreted accordingly, this was based on theory and the potential of reverse causality remains (e.g. Gatien, 2010). Despite these issues, Barling *et al.* (2002) noted that cross-sectional research designs are suitable for nascent areas of research, such as the one under study here. Future longitudinal research should confirm our findings.

Finally, as with most research, the generalizability of the current findings is limited to populations that share characteristics with the current samples. For example, research has demonstrated that unionization contributes positively to workers safety experience as unionized and nonunionized construction workers differ on a number of safety-relevant features such as exposure to safety training, knowledge about safety practices, employment stability, perceptions about coworkers' attitudes toward safety, and safety-self efficacy (Dedobbeleer *et al.*, 1990). However, this same research showed no differences in union and nonunion construction workers' perceptions of management's attitude toward safety and immediate leader's safety enforcement, indicating that unionization may not moderate the effects of leadership. Moreover, a more recent qualitative review pointed out that studies have been inconclusive in elucidating the effects of unionization on safety outcomes (Kelloway, 2004). Given that 23.1 and 26.1 percent of participants from the current studies indicated that they had suffered an injury within the last two months, it appears that despite the unionized status of the samples, safety remains a major concern. Nevertheless, it is prudent that future research considers union status of the target population when investigating the effects of leadership on employee safety performance.

Conclusion

Despite numerous technological advancements and increased industry regulations, occupational injuries and illnesses persist at alarming rates. As a result, researchers have invested substantially in identifying organizational strategies for improving worker safety performance. With leadership moving to the forefront of this research, the main objective of the two studies reported herein was to extend the literature linking leadership and organizational justice with employee safety by investigating the effects of leader justice, conceptualized in general and safety-specific contexts, on employee safety performance. Findings indicate that although operationalizing leader

justice in safety-specific terms may be useful in terms of stronger relationship with employee safety performance, the effects of leader justice on safety performance depend on the extent to which leaders support safety, regardless of whether leader justice is operationalized as general or safety-specific. Practically, these findings suggest that SSLJ, and LSS in particular, should be considered by organizations and safety interventionists alike when generating strategies or designing training programs to improve employee safety behaviors.

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Interactive
effects of leader
justice

315
