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The role of organizational trust in safety climate's influence on organizational outcomes

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ABSTRACT

Based on elements of social exchange theory and other conceptualizations of trust, a model was developed situating organizational trust as a central component to the relationship that safety climate has with organizational outcomes. Specifically, the model specified that two facets of safety climate – upward safety communication and management attitudes toward safety – would be positively related to organizational trust. Increased levels of trust would then predict increased motivation to engage in safe job-related behaviors, increased job satisfaction, and decreased turnover intentions. Another hypothesis investigated whether job safety relevance would moderate the relationship between safety climate and trust. Online survey research was conducted with 599 employees from 97 workgroups across a New England grocery store chain. Hierarchical linear modeling indicated support for trust mediating the relationship between safety climate and organizational outcomes; further, the relationship between safety climate and trust was stronger within workgroups where safety was more relevant.

1. Introduction

Without trust, relationships would not be able to survive (Diffie-Couch, 1984). Defined as positive expectations individuals have about the intent and behaviors of multiple organizational members based on organizational roles, relationships, experiences, and interdependencies (Mayer et al., 1995; Shockley-Zalabak et al., 2000), organizational trust has been shown to be associated with desired organizational outcomes such as increased job satisfaction, productivity and organizational commitment, as well as decreased absenteeism and turnover (Driscoll, 1978; Hopkins and Weathington, 2006; Perry and Mankin, 2007). Two recent reviews call attention to the importance of organizational trust. The first meta-analytic review considers the relationship that organizational trust has with other organizational constructs, such as risk taking and citizenship behaviors (Colquitt et al., 2007), whereas the second provides an overview of developments in the organizational trust literature (Schoorman et al., 2007).

The main goal of this work is to build a model based on past empirical research that exemplifies the central role that organizational trust plays in the relationship between safety climate and job/organizational outcomes. Previous studies have found that aspects of safety climate, such as management attitudes and communication, have an effect on organizational safety-related behaviors. Specifically, Zohar (2002) found that modifying supervisory safety behaviors led to better subunit safety records. By implementing an intervention designed to alter supervisory monitoring and rewarding of subordinate safety performance, he was able to increase ear plug use and decrease minor injury rate (Zohar, 2002). After a five-month follow-up, these findings had remained quite stable. Also, a meta-analysis by Clarke (2006) showed that high levels of safety climate led to increased safety participation and compliance. However, other researchers (Michael et al., 2006) argue that these aspects of safety are not sufficient in explaining organizational outcomes, and call for further research to find mediators or moderators to better explain this relationship. With this in mind, the present study examines the role of organizational trust in clarifying the link between safety climate and job/organizational outcomes. Additionally, because safety is more salient within certain job types (Cooper and Phillips, 2004; Wu et al., 2007), job safety relevance will be examined as a possible moderator of the impact that safety climate has on trust.

Our conceptual model is presented in Fig. 1. In elucidating this model, we begin by briefly reviewing the direct link between safety climate and organizational outcomes. We then argue for the inclusion of organizational trust as a key mediator of these relationships, based on similarities between aspects of safety climate and organi-

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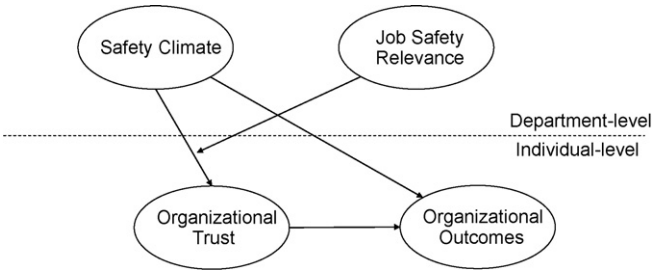

Fig. 1. Multilevel conceptual model with organizational trust mediating the relationship between safety climate and organizational outcomes and with job safety relevance moderating the effect of climate on trust.

zational trust the known impact that trust has on job/organizational outcomes. We conclude by considering the influence of job safety relevance in the nature of the mediated relationship.

1.1. Safety climate and job/organizational outcomes

The term "safety climate" was coined by Zohar in 1980. Although there is some debate in the literature as to whether safety climate is one single construct or can be broken into facets, the construct commonly refers to shared perceptions of the organization's practices and policies pertaining to safety. In a meta-analysis of 32 empirical studies of the correlates of safety climate, Clarke (2006) listed the numerous measurement instruments currently available to assess safety climate. Some facets that have been proposed – and that we focus on within the present research – include management attitudes toward safety (Zohar, 1980) and upward safety communication (Hofmann and Morgeson, 1999). Management attitudes toward safety include employees' perception that their supervisors view safety as important; upward safety communication refers to the comfort that subordinates feel in bringing safety-related information to their supervisors. Because safety climate has been conceptualized as *shared* perceptions, it naturally indicates a need to be aggregated to a grouplevel. Hence, in the present research, we operationalize safety climate as a group-level construct, as has been strongly advocated (cf., Hofmann and Stetzer, 1996; Zohar, 2000; Zohar and Luria, 2005).

Although safety climate has been linked to numerous organizational outcomes, by far the most prevalent association examined is with injuries, where safer climates are expected to be associated with fewer injuries. Despite the frequency of examination, there is not a clear answer to whether the relationship exists. For example, Clarke's (2006) meta-analysis found a non-significant relationship when considering 28 studies. In a longitudinal study, Neal and Griffin (2006) found this relationship to be more complicated. Group-level safety climate predicted subsequent individual-level safety motivation, which then predicted subsequent individual-level safety behaviors. When aggregated to the grouplevel, safety behaviors predicted subsequent group injuries. Due to constraints resulting from our use of archival data, we do not have safety behaviors in our model, but we largely replicate tests of their model with the following hypotheses:

Hypothesis 1. Group safety climate will be positively associated with individual-level safety motivation.

Because our analytic strategy does not allow for testing relationships between individual-level predictors and group-level outcomes, we aggregated safety motivation to the group level to test the relationship between safety motivation and group-level injuries:

Hypothesis 2. When aggregated, group-level safety motivation will be negatively associated with group-level injuries.

Considerably less frequent in the workplace safety literature is the consideration that safety climate might affect other non-safety, job/organizational outcomes. The first empirical study, to our knowledge, to articulate and find a direct relationship between safety climate and job satisfaction was conducted by Morrow and Crum (1998). Based on the Theory of Work Adjustment (Dawis and Lofquist, 1984), they predicted that safety, as an important environmental need, would affect workers' perception that their working conditions were favorable, resulting in enhanced organizational attitudes, such as job satisfaction. Additionally, in their cross-sectional study, they found that safety climate was positively related to intentions to remain within the organization. In a similar study, Michael et al. (2005) found safety climate to be a predictor of job satisfaction and withdrawal behaviors. In line with these studies, we hypothesized:

Hypothesis 3. Group safety climate will be positively associated with individual-level job satisfaction.

Hypothesis 4. Group safety climate will be negatively associated with individual-level turnover intentions.

1.2. Organizational trust as a mediator of the safety climate–outcomes relationships

As mentioned above, we argue that organizational trust is a key mediator of the safety climate–outcomes relationships, based on similarities between aspects of safety climate and organizational trust as well as the known effects of trust on organizational outcomes. In this section, we first create these theoretical links between safety climate and organizational trust by separating the two facets of safety climate that we studied and by carefully explicating the process by which these facets of safety climate can help establish or maintain organizational trust. After that, we explain how organizational trust can lead to our focal organizational outcomes.

1.2.1. Safety climate leading to organizational trust

Organizational factors such as open communication, increased decision authority, information sharing, and the sharing of feelings/perceptions are responsible for engendering trust (Mishra and Morrissey, 1990). For example, Whitener et al. (1998) theorize that managers who are accurate in their communication, provide adequate explanations, and keep the lines of communication open encourage trust among their employees. Further, Shockley-Zalabak et al. (2000) found that accuracy of information, explanations for decisions, and openness are three aspects of communication that are positively related to trust. Similarly, Firth-Cozens (2004) found that open communication predicts increased levels of trust, and Diffie-Couch (1984) equates comfortable communication with a trusting environment.

These open lines of communication can also be viewed as social exchanges. Social exchange theory (Blau, 1964) states that trust can be generated in two ways: through the regular reciprocation of benefits received and/or through the gradual expansion of social exchanges over time. Blau indicated that as more of these exchanges take place, the higher the levels of trust become. For example, Whitener et al. (1998) portrayed a scenario in which two managers were working with a subordinate who telecommutes. The manager who forms a strong social bond with his or her employee by partaking in frequent social exchanges and expanding the breadth of these exchanges over time should develop a higher level of trust in his or her employee than the manager who fails to do so.

Despite the mounting evidence generally linking positive communication with organizational trust, Gilbert and Tang (1998) called for greater specificity in the nature of these communication

variables and their relationships with organizational trust. Upward safety communication – the willingness of employees within an organization to share comments regarding safety issues with their superiors (Hofmann and Stetzer, 1998) – is easily construed as a more specific form of communication that possibly links to the development of a trusting environment. If open communication encourages trust, the existence of upward safety communication (simply a more specific form of open communication) should also be related to trust within an organization. Hence, we propose:

Hypothesis 5. Group upward safety communication will be positively associated with individual-level organizational trust.

Similar to the above line of reasoning, the antecedent of organizational trust that centers on sharing feelings and perceptions is akin to the second component of safety climate that we studied: perceptions of management attitudes toward safety. When managers alert subordinates to the importance of safety, they are outwardly communicating their perceptions about the issue. In doing so, they are expressing their concern for the well-being of the employees. This concern falls squarely within Mishra's (1996) conceptualization of trust, which theorizes trust as being comprised of competence, openness, concern, and reliability. Hence, if employees truly believe that their managers value safety, they note their managers' concern for them, leading to increased organizational trust. Therefore, we propose the following:

Hypothesis 6. Group perceptions of management attitudes toward safety will be positively associated with individual-level organizational trust.

1.2.2. Organizational trust leading to job/organizational outcomes

As was briefly mentioned before, increased levels of organizational trust have been shown to be related to desired organizational outcomes such as increased productivity, job satisfaction and organizational commitment, as well as decreased absenteeism and turnover (Driscoll, 1978; Gregory et al., 2007; Hopkins and Weathington, 2006; Laschinger et al., 2001; Tzafrir, 2005). These relationships appear to be grounded in expectations that employees have about their jobs. In particular, trust has been defined as confident, positive expectations concerning another's behavior (Lewicki et al., 1998) and job satisfaction has been characterized as an affective reaction to met job-related expectations (e.g., what the employee deserves or desires from the job; Cranny et al., 1992). Applying Lewicki et al.'s individual trust definition to understanding organizational trust, we propose that if an employee is confident that their organization will meet their expectations and, then, find their expectations actually met, their organizational trust will have culminated in job satisfaction. Similar logic seems to hold with respect to turnover intentions; specifically, with met expectations, employees will be less likely to quit their jobs.

Although our model replicates these previous findings in suggesting that organizational trust affects satisfaction and turnover, our larger point is that trust explicitly explains the impact of safety climate on job/organizational outcomes. Specifically, we believe that the direct relationship of safety climate on job/organizational outcomes will be diminished with the inclusion of trust. Although the direct relationships are viable and meaningful, at least a plausible explanation is that they would not exist without the intermediate presence of organizational trust. In other words, trust is developed by working in an environment in which management deems safety to be important and communications surrounding safety are welcomed; this trust, subsequently, influences employees' satisfaction with their jobs and desire to remain a member of the organization. Hence, we hypothesize:

Hypothesis 7. Individual-level organizational trust will mediate the relationship between group-level safety climate and individual-level job satisfaction.

Hypothesis 8. Individual-level organizational trust will mediate the relationship between group-level safety climate and individual-level turnover intentions.

Social exchange theory (Blau, 1964) would suggest that once employees trust their organizations, they would reciprocate by conforming to organizational standards for safety. To our knowledge, there is only one empirical study that links organizational trust with employees' motivations to engage in safe behavior. DePasquale and Geller (1999) surveyed 701 employees across 20 organizations that had implemented a behavior-based safety process. Their data analysis identified five variables that significantly predicted employee involvement in these processes, one of which was trust. As above, this perceived trust potentially explains how safety climate translates into safety motivation, leading us to propose:

Hypothesis 9. Individual-level organizational trust will mediate the relationship between group-level safety climate and individual-level safety motivation.

1.3. Job safety relevance

Our final hypothesis was proposed to investigate whether job safety relevance will moderate the relationship between safety climate and organizational trust. Specifically, the salience of safety certainly varies across jobs that people perform. For example, it seems reasonable that safety would have increased saliency for someone working in a steel mill than for someone working in a clerical role in an office setting. Previous research has hinted at this relationship, but has not examined it in detail. For instance, a recent study was conducted that found employees' perceptions of safety climate varied due to job title (Wu et al., 2007). Also, Cooper and Phillips (2004) found support for their hypothesis that differences in employee perceptions will vary among the different departments of a manufacturing industry.

Hypothesis 10. The proposed positive relationships between group safety climate and individual-level organizational trust will be stronger for jobs where safety is more relevant.

2. Method

2.1. Participants

All non-management employees of a large New England grocery store chain were invited to participate in a web-based survey of job-related health and safety. Although this was an archival dataset, the motivating factor underlying the data collection was to examine safety within this organizational context. To better understand the nature of the dataset, the following description of the recruitment/sampling is offered: of the 2291 employees, age 18 and over, who were invited to participate in the survey, 1069 provided data by the close of the survey, yielding a response rate of 47%. Of these, 965 individuals provided useable data at the individual-level. These employees worked in 386 unique workgroups that were comprised of departments ($n = 11$) within store locations ($n = 54$). Unfortunately, many of these workgroups were quite small, which is not surprising when considering some departments within a grocery store (e.g., floral). For our analyses, we retained workgroups with a minimum of three people providing data. With this minimum in place, we were left with 599 individuals working in 97 unique workgroups across the organization.

Table 1
Demographic overview of sample.

Age	Gender	Years with grocer	Job tenure (years)	Full time/part time
18–30: 270	Male: 29.8%	0–10: 464	0–10: 446	FT: 11.4%
31–45: 109	Female: 70.2%	11–20: 77	11–20: 52	PT: 88.6%
46–60: 127		21–30: 13	21–30: 11	
61–75: 56		>30: 3	>30: 2	
>75: 7				

Demographic characteristics of these remaining respondents appear in Table 1. Participants remaining in useable workgroups included 172 men and 406 women. They ranged from 18 to 83 years of age ($M = 36.80$; $SD = 17.24$) and had worked for the organization for an average of approximately six years ($M = 6.05$; $SD = 6.31$). Respondents did not perfectly represent the larger employee population when examining employee sex and age. The overall employee population was comprised of approximately 49% men and 51% women, whereas the responding sample consisted of 30% men and 70% women (χ^2 (1) = 83.37, $p < .001$, $\varphi = .38$). This difference in gender, however, was akin to other survey research in that women were more likely than men to respond (Green, 1996). Age representativeness was also somewhat askew (χ^2 (7) = 18.76, $p < .01$, $\varphi = .18$); examination of standardized residuals indicated significantly more respondents in the 18–24 age group and significantly fewer respondents in the 35–44 age group.

2.2. Procedure

The survey was given to employees during their normal work hours, as part of their ongoing employee training. Participants logged onto their intranet training site using a unique identifier that was used to link their responses back to the organization's archival demographic and accident data. Once logged in, the employees were prompted to complete the survey hosted on a university server, and the survey generally took around 15 to 20 min to finish.

2.3. Measures

See Table 2 for a summary of scale descriptives and individual-level alpha reliabilities, all of which were at appropriate levels. All items were rated on a 5-point Likert scale ranging from 1 = *strongly agree* to 5 = *strongly disagree*. A list of the items for each construct used in the study can be found in Appendix A.

2.3.1. Group upward safety communication

To measure upward safety communication, three items from a scale reported by Hofmann and Morgeson (1999) were utilized. An example item included in this scale was "My department manager openly accepts ideas for improving safety." Validity information concerning this scale can be found in Hofmann and Stetzer (1998). The items were checked for within-group agreement and between-group variance, to determine whether aggregation was appropriate. The r_{wg}, a measure of within-group agreement (James et al., 1993), was calculated for each group. The median r_{wg} was 0.90, which was well above the recommended 0.70, supporting the notion that workgroups generally agreed on their perceptions of upward safety communication. We also examined the intra-class correlation (ICC) to test the amount of between-group variance relative to total variance. The ICC value was 0.16, and the associated F-test was significant ($F(96, 598) = 1.89$, $p < .001$). Because the r_{wg} and ICC values supported aggregation, items were aggregated to the workgrouplevel by simply averaging individual group members' responses.

2.3.2. Group management attitudes toward safety

Management attitudes toward safety were assessed using three items taken from a scale reported in Neal and Griffin (2006). An example item was "My department manager gives safety a high priority." The three-item scale was found to be both reliable and valid in Neal and Griffin's two-phase longitudinal study. As before, r_{wg} and ICC values were calculated. The median r_{wg} value for group management attitudes toward safety was 0.89, again well above 0.70. The ICC value was 0.10 ($F(96, 598) = 1.70$, $p < .001$), supporting the aggregation of this measure to the workgroup level by averaging individual group members' responses.

2.3.3. Organizational trust

Organizational trust was assessed using a three-item scale reported in Robinson (1996). An example item in this scale was "I believe (grocer) has high integrity." These items were taken from a previously validated scale developed by Gabarro and Athos (1976), and proved to be reliable in Robinson's three-phase longitudinal study.

2.3.4. Safety motivation

Safety motivation was assessed using a three-item scale from Neal and Griffin (2006). An example item is "I feel that it is important to maintain safety at all times." The measure demonstrated good alpha reliability in both waves of Neal and Griffin's longitudinal data collection. Because this measure was also included in group-level analyses with group injury rates, we examined relevant aggregation statistics. The median r_{wg} value is 0.93, indicating excellent group agreement for safety motivation. The ICC value was only 0.03 ($F(96, 598) = 1.20$, *n.s.*). Although such low between-group variance does limit the possibility of finding the hypothesized effect, we continued with our group-level analyses because the unusually high r_{wg} strongly suggests that group consensus exists on this measure and because we believe that the skewed nature of the safety motivation data (most participants indicated they

Table 2
Scale descriptive statistics, correlations and alpha reliabilities among study variables.

		# of items	M	*SD*	1	2	3	4	5	6	7
1	Management attitudes toward safety	3	4.07	.67	**.82**						
2	Upward safety communication	3	3.92	.77	.83	**.92**					
3	Job safety relevance	3	3.81	.80	.24	.22	**.84**				
4	Organizational trust	3	3.88	.73	.50	.45	.27	**.76**			
5	Safety motivation	3	4.20	.58	.54	.46	.32	.45	**.78**		
6	Job satisfaction	3	3.97	.77	.49	.45	.23	.70	.45	**.85**	
7	Turnover intentions	4	2.46	.99	−.39	−.34	−.21	−.59	−.33	−.71	**.86**

Note: $N = 599$. M = mean. SD = standard deviation. Individual-level scale reliabilities in bold along diagonal.

had high levels of safety motivation) is driving the limited variability.

2.3.5. Job satisfaction

Job satisfaction was measured using a three-item variation of a scale developed by Cammann et al. (1983). An example item included in this scale was "In general, I like working for (grocer)." Camman and colleagues used a multidimensional scaling technique and a principal-axis factor analysis to assess the validity of the items selected for the scale.

2.3.6. Intent to turnover

Employee's turnover intentions were assessed using three items drawn from measures reported by Cammann et al. (1983) and a fourth item developed specifically for this study. An example item included in this scale was "I think about quitting my job at (grocer)." As before, Camman and colleagues used a multidimensional scaling technique and a principal-axis factor analysis to assess the validity of the items selected for the scale.

2.3.7. Job safety relevance

Job safety relevance was assessed using a four-item measure of perceived effect of required job pace on safety that was based on Zohar (1980) as reported by Mueller et al. (1999). This construct measures the tension between productivity and safety inherent in the job (example item: "Job duties in my department often prevent employees from acting as safely as they would like"). This tension can indicate jobs for which safety is particularly relevant. Mueller and colleagues collected data from a large sample of undergraduate students and conducted confirmatory factor analyses to examine the measurement properties of this scale. Factor loadings were not reported, but the fit of the four-factor model they examined was adequate.

Because members in the same workgroup (i.e., grocery department) shared the same job type, we sought to aggregate this to the workgroup level. As with the safety climate measures reported above (upward safety communication and management attitudes toward safety), the r_{wg} and ICC values were calculated to examine the appropriateness of aggregating this measure to represent workgroup climate. The median r_{wg} value for group job safety relevance was 0.86, again well above 0.70. The ICC value was 0.08 ($F(96, 598) = 1.53$, $p < .01$), supporting the aggregation of this measure to the workgroup level by averaging individual group members' responses.

2.3.8. Injuries

Organizational data were collected on reported injuries for the 20 months preceding the survey start date and 20 months following the survey close date. These injuries included but are not limited to musculoskeletal complaints, cuts, and loss of consciousness. Because recent meta-analysis results indicate that the strongest relationships between safety climate and injuries were found for prospective studies where group safety climate predicts group injuries (Clarke, 2006), these accident data were aggregated to the grouplevel by summing the number of reported injuries for each workgroup. To maximize variance, injuries were included whether or not the injured individual was invited or responded to the survey.

3. Results

Cross-level mediation was tested using the method recommended by Zhang et al. (2009). Our mediation model is what is commonly called a 2-1-1, which means that the predictor resides at Level 2 (department), and the mediator and outcome reside at Level 1 (individual). The recommended analyses follow the same procedure as the classic Baron and Kenny (1986) approach, with one difference at the last step that will be explained later. Thus, our first step was to test the cross-level, intercepts-as-outcomes model where the safety climate measure (upward safety communication or management attitudes toward safety) predicts the organizational outcome of interest (safety motivation, job satisfaction, or turnover intentions). The next step was to test the cross-level, intercepts-as-outcomes model (Hofmann, 1997) where safety climate predicts the mediator (organizational trust). Finally, a model was tested where both the Level 2 predictor (safety climate) and the Level 1 mediator (trust) predict the outcomes of interest. However, to ensure that the model appropriately tests between-group mediation and not spurious within-group effects, group-mean centering was used and the aggregate value of the Level 1 mediator (trust) was included in the Level 2 intercept equation, as follows:

$$\text{Level 1}: \quad Y_{ij} = \beta_{0j} + \beta_{1j}(\text{trust}) + r_{ij}$$

$$\text{Level 2}: \quad \beta_{0j} = \gamma_{00} + \gamma_{01}(\text{safety climate}) + \gamma_{02}(\text{aggregate trust}) + u_{0j}$$

$$\beta_{1j} = \gamma_{10}$$

As in standard regression testing, a Sobel test can be conducted using regression coefficients and their standard errors. Key regression coefficients for each mediation analysis can be found in Table 3. A full list of regression coefficients for each step can be obtained by contacting the first author.

3.1. Mediation results for upward safety communication

In the first step, safety motivation was regressed onto upward safety communication. The γ_{01} for upward safety communication was significant (Step 1 $\gamma_{01} = 0.315$, $p < .001$), supporting Hypothesis 1. In the second step, trust was regressed onto upward safety communication. The γ_{01} for upward safety communication was significant (Step 2 $\gamma_{01} = 0.331$, $p < .001$), supporting Hypothesis 5. For the final step, safety motivation was regressed onto upward safety communication and trust, as in the equations above. The γ_{01} for upward safety communication was still significant ($\gamma_{01} = 0.216$, $p < .01$), but lower than the γ_{01} from Step 1. A Sobel test was conducted, and results indicated that the reduction in the regression coefficient was significant ($z = 3.08$, $p < .01$). Thus, the results suggest that trust partially mediates the relationship between upward safety communication and safety motivation, providing partial support for Hypothesis 9.

When job satisfaction was the outcome variable, the initial γ_{01} for upward safety communication predicting job satisfaction was significant (see Table 3), supporting Hypothesis 3. When the mediator was added into the model, the γ_{01} for upward safety communication was reduced (see Table 3) but still significant. Results from a Sobel test indicated that the reduction in the regression coefficient was significant ($z = 3.95$, $p < .001$). Thus, the results suggest that trust partially mediates the relationship between upward

Table 3
Key hierarchical linear regression coefficients for mediation tests.

Construct name	γ_{01} X → Y	γ_{01} X → Y with M	Sobel z
Predictor: upward safety communication			
Outcome: safety motivation	0.315^{***}	0.216^{**}	3.08^{**}
Outcome: job satisfaction	0.425^{***}	0.197^{**}	3.95^{***}
Outcome: turnover intentions	-0.369^{***}	-0.115^{ns}	-3.72^{***}
Predictor: management attitudes toward safety			
Outcome: safety motivation	0.461^{***}	0.351^{***}	2.88^{**}
Outcome: job satisfaction	0.540^{***}	0.242^{**}	4.32^{***}
Outcome: turnover intentions	-0.456^{***}	-0.116^{ns}	-4.03^{***}

$^{*}p < .05$.
$^{**}p < .01$.
$^{***}p < .001$.

safety communication and job satisfaction, providing partial support for Hypothesis 7.

Similar results were found when the outcome was turnover intentions (see Table 3). Upward safety communication predicted turnover intentions, supporting Hypothesis 4. When the mediator was included in the model, the γ_{01} for upward safety communication was not significant ($\gamma_{01} = -0.115$, $p > .05$). A Sobel test confirmed that the reduction in the regression coefficient was significant ($z = -3.72$, $p < .001$), suggesting that trust fully mediates the relationship between upward safety communication and turnover intentions, supporting Hypothesis 8.

3.2. Mediation results for management attitudes toward safety

For the mediation where management attitudes toward safety predict safety motivation, safety motivation was regressed onto management attitudes toward safety in the first step. The γ_{01} for management attitudes toward safety was significant (Step 1 $\gamma_{01} = 0.461$, $p < .001$), also supporting Hypothesis 1. In the second step, trust was regressed onto management attitudes toward safety. The γ_{01} for management attitudes toward safety was significant (Step 2 $\gamma_{01} = 0.446$, $p < .001$), supporting Hypothesis 6. For the final step, safety motivation was regressed onto management attitudes toward safety and trust, as in the equations above. The γ_{01} for management attitudes toward safety was still significant ($\gamma_{01} = 0.351$, $p < .001$), but lower than the γ_{01} from Step 1. A Sobel test was conducted to indicate that the reduction in the regression coefficient was significant ($z = 2.88$, $p < .01$). Thus, the results suggest that trust partially mediates the relationship between management attitudes toward safety and safety motivation, providing partial support for Hypothesis 9.

When job satisfaction was the outcome variable, the initial γ_{01} for management attitudes toward safety was significant (see Table 3), supporting Hypothesis 3. When the mediator was added into the model, the γ_{01} for management attitudes toward safety was reduced (see Table 3) but still significant. Results from a Sobel test indicated that the reduction in the regression coefficient was significant ($z = 4.32$, $p < .01$). Thus, the results suggest that trust partially mediates the relationship between management attitudes toward safety and job satisfaction, providing partial support for Hypothesis 7.

The pattern of results for turnover intentions was the same for management attitudes toward safety as they were for upward safety communication (see Table 3). Management attitudes toward safety predicted turnover intentions, supporting Hypothesis 4. In the final step of the mediation test, the γ_{01} for management attitudes toward safety was no longer significant ($\gamma_{01} = -0.116$, $p > .05$) when the mediator was included in the model. A Sobel test confirmed that the reduction in the regression coefficient was significant ($z = -4.03$, $p < .001$), suggesting that trust fully mediates the relationship between management attitudes toward safety and turnover intentions, supporting Hypothesis 8.

3.3. Results for job safety relevance as a moderator

Hypothesis 10 proposed Level 2 job safety relevance would moderate the relationship between Level 2 safety climate (upward safety communication and management attitudes toward safety) and Level 1 organizational trust. To test this, hierarchical linear modeling was used to test a slopes-as-outcomes model (Hofmann, 1997). The general model used for testing is as follows:

$$\text{Level 1}: Y_{ij} = \beta_0 + r_{ij}$$

$$\text{Level 2}: \beta_{0j} = \gamma_{00} + \gamma_{01}(\text{safety climate}) + \gamma_{02}(\text{job safety relevance}) + \gamma_{03}(\text{safety climate} \times \text{job safety relevance}) + u_{0j}.$$

Fig. 2. Job safety relevance as a moderator of the relationship between upward safety communication and organizational trust.

Significant cross-level moderation is indicated by a significant γ_{03} value. As recommended by Hofmann and Gavin (1998), variables were grand-mean centered for all analyses, but graphs were based on models with uncentered variables. A full list of all regression coefficients can be obtained by contacting the first author.

For upward safety communication as the predictor of organizational trust, the γ_{03} value was significant ($\gamma_{03} = 0.274$, $p < .01$). Similarly, when management attitudes toward safety were the predictor of organizational trust, the γ_{03} value was significant ($\gamma_{03} = 0.277$, $p < .05$). To better understand these results, the regression equations for each was graphed, using the minimum and maximum observed values for the predictor (upward safety communication or management attitudes toward safety) and one standard deviation above and below the mean for the moderator (job safety relevance). As shown in Fig. 2, the relationship between upward safety communication and trust is stronger for jobs with high job safety relevance, supporting Hypothesis 10. Likewise, in Fig. 3, the graph shows that the relationship between management attitudes toward safety and trust is stronger for jobs with high job safety relevance, also supporting Hypothesis 10.

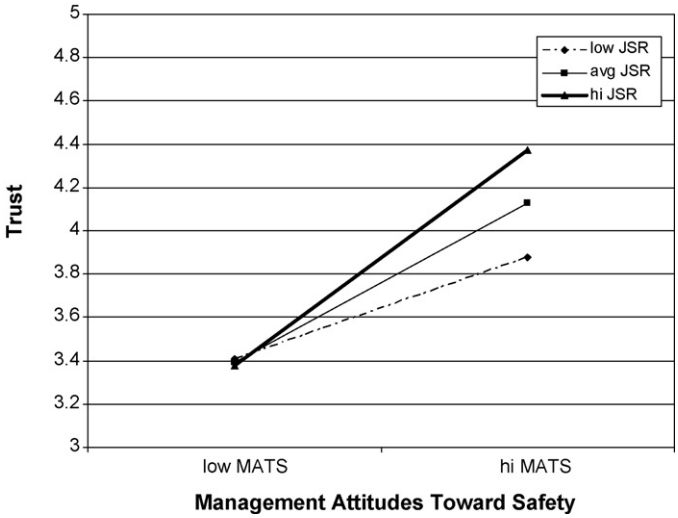

Fig. 3. Job safety relevance as a moderator of the relationship between upward safety communication and organizational trust.

3.4. Results for safety motivation and post-survey injuries

Analyses were conducted to test whether increased safety motivation would be associated with fewer post-survey injuries. Because of the low base-rate of injuries, these analyses were conducted at the department level, such that a department's average safety motivation was used to predict number of injuries in the department. A Poisson regression was run with pre-survey injuries and group size as control variables (Neal and Griffin, 2006). Results indicated that departments' average safety motivation did not predict department injuries for the 20 months following the survey ($B = 0.692$, $p < .10$). Thus, results do not support Hypothesis 2.

4. Discussion

The intention of this research study was to answer the call for further research into other variables that could help solidify the link between safety climate and organizational outcomes of interest. The results indicate that organizational trust played a central role in the proposed model. More specifically, for the first organizational outcome that was tested, trust partially mediated the relationship between safety climate and safety motivation. That trust was a partial mediator points to the need for researchers to consider other factors that may help explain the relationship. Because both predictor and outcome are about safety, it is not surprising that a non-safety-related construct (i.e., organizational trust) does not fully mediate this relationship. Perhaps something like perception of risk at work or even awareness of consequences for non-compliance with safety procedures would be useful to study in the future, to account for safety-related variance in these relationships.

The second organizational outcome tested was job satisfaction. As with safety motivation, trust was only a partial mediator, meaning there are likely to be other explanatory factors omitted that would help explain the relationship between safety climate and job satisfaction. We speculate that those other factors might include perceived organizational support (i.e., perceptions about the extent to which an organization values its employees; Eisenberger et al., 1986), leader-member exchange (i.e., strength of the supervisor–subordinate overall working relationship; Graen and Scandura, 1987) or job control (i.e., autonomy; Karasek, 1979). For instance, organizational trust captures one aspect of the social exchange, but it does not perfectly overlap with perceived organizational support or leader-member exchange, which are other constructs commonly studied in association with social exchange theory in organizations. If either of these is more closely related to job satisfaction than organizational trust, they may serve as more complete mediators of the relationship.

The third organizational outcome that was tested was turnover intentions. The relationship between safety climate and turnover intentions was fully mediated by trust. It is not completely surprising that the climate—turnover intentions relationship was fully mediated, whereas the climate—job satisfaction relationship was not. Job satisfaction includes cognitive and affective evaluations about one's job (Weiss, 2002), and although this includes some evaluation of the organization as a whole, it is inherently focused on the evaluation of the job itself. Turnover intentions, in contrast, are related strongly to perceptions about both one's job and one's organization, because when an employee quits, s/he leaves the job and the organization at the same time. Turnover intentions have also been shown to be affected by social exchange (Johns, 2002), lending additional support to the expectation that safety climate would affect turnover intentions through organizational trust perceptions.

Additionally, relationships between safety climate and trust were shown to be moderated by the job safety relevance for each department. As predicted, the positive relationships between safety climate and organizational trust were stronger when job safety relevance is high. In departments where safety is highly relevant and competes with productivity goals for attention, safety climate can be expected to be more salient and important a source of information from which employees establish or maintain beliefs about their trust in the organization.

Finally, analyses testing the relationship between group-level safety motivation and group-level injuries were conducted using Poisson regression to account for the low base-rate of injuries in each department, and covariates were included to remove potential suppressor effects (see Neal and Griffin, 2006, for a full explanation of this phenomenon). Results indicated that there was no relationship between departments' average safety motivation and department injuries for the 20 months after the survey closed. These results suggest that safety motivation is not enough to assure employee safety in this organization. For example, the most motivated workers may still experience injuries if there exist organizational constraints on safe behavior. Future research could examine the effectiveness of organizational interventions designed to identify and improve organizational influences on safety. However, there are also methodological considerations for this non-significant result. One is the assumption that there is isomorphism between the constructs of individual-level and group-level safety motivation. It could be that group-level safety motivation represents a slightly different construct than individual-level motivation (for more detail on this concept, see Bliese, 2000). Another is the non-significant *F*-test for the ICC value for group-level safety motivation. Future research could also test the relationship in a sample with higher variance in safety motivation and/or examine relationships between group-level safety climate, individual-level safety motivation, and individual-level injuries.

4.1. Limitations and future research

The survey portion of the study was cross-sectional in nature, disallowing the evaluation of these relationships over time. It has been noted that mediation processes are inherently causal (for a review of mediation, see MacKinnon et al., 2007), and our data do not allow for causal inferences. Future research should assess the validity of this model in a longitudinal study designed to more carefully assess the assumed underlying causal relationships among the constructs. Cross-sectional methodology certainly has its weaknesses; however, it can still provide a picture of how people feel about their jobs and workplaces, and insight into the interrelationships at play within an organization (Spector, 1994).

Additionally, because the sample was not perfectly representative of the overall grocery store employee population with respect to either gender or age (the only demographic characteristics available from the organization for comparison), we must note that these results may not generalize to either the entire body of employees at this specific grocery store chain nor to the population of workers worldwide. In particular, young workers (ages 15–17) were specifically excluded by our sampling method, and it has been noted that young workers experience more injuries than older workers do (for a review, see Loughlin and Frone, 2004). Special caution must be taken when considering results from the current study for applications to younger workers. We also note that the response rate of 47% is modest, and as such, the results may not represent non-respondents appropriately. Employees with very low organizational trust and/or job satisfaction may have elected not to participate in the survey at all. Future research should examine the proposed model within other occupational/organizational environments to assess whether the relationships hold.

One final limitation of the present research is its reliance on data from a single organization in a single industry. Although conducting the study in this way allowed us to examine important local (i.e., department-level) influences on individual employees' beliefs, attitudes, and behavioral intentions, it is possible that the results reported may not generalize to other organizations or industries. However, we note that the injuries reported in this organization are likely to be common ones: slips/falls, strains/sprains, and cuts/contusions. Given our finding regarding job safety relevance, we would expect that our results would hold for other organizations and industries that are as risky or riskier than the one in the current study, but whether they would replicate in a sample where workplace safety is less salient or relevant remains to be seen.

4.2. Implications

Results from the current study continue to support the important role of social exchange when considering the antecedents and consequences of safety climate. If employees were all androids, then safety climate would be important for workplace safety merely through the consistent application of policies and procedures in each workgroup. However, akin to the shift from classical organizational theorizing (e.g., Weber, 1922) to a human resources-based approach to organizational theory (e.g., McGregor, 1960), we note that because employees are human, it is instructive for researchers and managers to understand the social subtext that is likely to be inherent in messages about safety disseminated by managers. Safety climate communicates not just "how we do things around here," but also implies a potential concern for employee health and safety that could establish or maintain the trust an employee has in the organization. Our results indicated that the likelihood that safety climate communicates something that would predict trust is increased when safety is a particularly relevant concern for that job type. This is not especially surprising: in jobs where task productivity and safety demands are not in conflict very often, employees are less likely to attach strong social meaning to safety climate.

It is important for managers and supervisors to realize that trust is central in leading to a more satisfied and dedicated workforce. If trust-based safety climate is developed within organizations, the resulting organizational trust could pave the way to other desired outcomes such as improved teamwork, leadership, goal setting, and cooperative behaviors (Shockley-Zalabak et al., 2000). This model may offer supervisors an escape from the traditional compensation-based rewards systems that are common among organizations today. Rather than giving out prizes or gift packs in an attempt to earn trust and build satisfaction/dedication, employers may want to consider developing a trusting environment by communicating concern about employees through management attitudes about safety and encouraging two-way communication about safety issues.

In addition to expected effects on safety motivation, safety climate can also influence the evaluations employees make about their jobs (job satisfaction) and whether they will want to continue their employment (turnover intentions). Again, researchers and managers alike should continue to recognize that attending to (or worse, neglecting!) safety climate can have effects outside the sphere of safety outcomes. Safety climate appears to be able to contribute directly to a trusting work environment. Working in a trusting environment is likely to subsequently lead to increased job satisfaction and decreased turnover intentions, because the antecedents in the proposed model, namely upward safety communication and management attitudes toward safety, may foster sentiments of trust while attenuating feelings of distrust in employees (Lewicki et al., 1998). Again, emphasizing the central role of trust in these relationships could lead to a more satisfied and dedicated workforce.

5. Conclusion

Trust has been called the missing piece in the safety puzzle (Conchie et al., 2006), and was the cornerstone of the current proposed model involving upward safety communication, management attitudes towards safety, and three organizational outcomes—job satisfaction, turnover intentions, and safety motivation. Trust partially or fully mediated the safety climate—outcome relationship across all six possible sets of analyses. Additionally, job safety relevance was crucial in the extent to which trust was increased by the two facets of safety climate. We hope that these present results might pave the way for future research into the impact of trust on the health and safety within organizations.

Author note

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Appendix A.

Construct	Items
Management attitudes toward safety	My department manager gives safety a high priority My department manager places a strong emphasis on workplace health and safety My department manager considers safety to be important
Upward safety communication	My department manager openly accepts ideas for improving safety My department manager encourages open communication about safety My department manager is easy to talk to about safety issues
Job safety relevance	Job duties in my department often prevent employees from acting as safety as they would like Job duties in my department often interfere with employees' abilities to comply with (grocer) safety practices Job duties in my department often interfere with employees' abilities to ensure adequate levels of workplace safety
Organizational trust	I believe (grocer) has high integrity I am not sure I fully trust (grocer) (reverse scored) In general, I believe (grocer's) motives and intentions are good
Safety motivation	I feel that it is worthwhile to put in effort to maintain or improve my personal safety I feel that it is important to maintain safety at all times I believe that it is important to reduce the risk of accidents and incidents in the workplace
Job satisfaction	In general, I like working for (grocer) All in all I am satisfied with my job at (grocer) In general, I don't like my job at (grocer) (reverse scored)
Intent to turnover	I think about quitting my job at (grocer) I see myself staying with (grocer) for a long time (reverse scored) I plan to look for a new job during the next year I have considered leaving (grocer) for advancement opportunities not available here

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