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Association of risk exposure, organizational identification, and empowerment, with safety participation, intention to quit, and absenteeism

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ABSTRACT

Occupational safety is an important topic within organizational psychology research, with exposure to a variety of risks likely to influence a number of psychosocial and physical outcomes. Research has addressed the relationship that organizational safety has with the psychological constructs of organizational identification (OID), and empowerment. This study used work-related risks, OID, and empowerment, as predictors of organizational outcomes: safety participation, reported intention to quit, and absenteeism, on a sample of 205 managerial employees from an Australian transport and logistics organization. Ford and Tetrick's (2011) workplace safety model was extended to examine the moderating effects of perceived supervisor safety practices, and physical and psychosocial safety climates on the relationship between OID, empowerment, and organizational outcomes. While OID and supervisor safety practices (negatively) predicted intention to quit, risk exposure, OID, supervisor safety practices, and safety climate predicted safety participation. However, absenteeism was only predicted by empowerment (impact). The higher an employee's workplace empowerment, combined with the more positively they rated their supervisor's safety practices, predicted increased safety participation in the workplace, highlighting a moderating effect. A revised model described relationships between contextual, organizational safety, and psychological variables. Results provided a foundation for further research into relationships between workplace risks, psychological variables, safety factors, and organizational outcomes.

1. Introduction

Increasing regulatory and market pressure drives managers to invest greater resources for enhancing employee safety and organizational connections. Little research has investigated organizational identification (OID), empowerment, and safety climate concurrently (Ford and Tetrick, 2011). Yet, as a heavily researched organizational construct (Lee et al., 2015; Riketta, 2005), OID could help to account for variance in some safety-related variables. This study tested a model of organizational risks, OID, and psychological empowerment with three organizational outcomes. Empowerment and OID have been associated with enhanced well-being, and increased staff retention (Mael and Ashforth, 1992; Spreitzer, 1995). High levels of intention to quit and absenteeism have been outcomes both for high hazard organizations, and for organizations reporting low employee OID and empowerment (Harrison and Martocchio, 1998; Riketta, 2005; Seibert et al., 2011). Also important to organizations is safety climate, generally represented as employee perceptions of safety procedures, and practices (Zohar, 2008). These psychological and safety variables can be important for organizational reputation, as well as employee behavior and customer perceptions.

Despite managers' overall responsibility for, and influence upon, many workplace safety and risk issues, most research exploring variables related to these issues has used shop floor rather than management samples. Seeking to understand more about a management perspective on broader aspects of organizational safety and risk, this study gathered data from a middle management sample in a large transport and logistics organization. As well as parts of its workforce encountering many traditional physical hazards, such as would be expected from exposure to heavy machinery, frequent vehicle movements, and a range of typical workplace hazards, this tightly-coupled organization was exposed to a number of other potential risks (Gao et al., 2017). Possibly resulting from initially minor system errors, these included transport delays, a degraded network, as well as associated potential legal and financial consequences. These features, which made for a frequently stressful working environment, meant that the organization had to display many high-reliability characteristics. Some of the complexities of managing risk within such an organization have been described by Ding et al. (2017).

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1.1. Hypothesized model

This study extended Ford and Tetrick's (2011) workplace safety model, in which the influence of occupational hazards on safety participation was fully mediated by OID and empowerment. While a number of workplace safety models exist (Beus et al., 2016), this model was selected because of its unique combination of organizational, contextual, and safety-specific variables hypothesized to be associated with both safety and individual-level outcomes. Potentially many factors relate to safety outcomes. The study sought to clarify the relationship between two additional outcomes and OID/empowerment due to the volume of research highlighting them as important to organizational effectiveness. Employee absences and stress or dissatisfaction – as potential precursors to quitting or "presenteeism" – might inter alia, impact safety through additional workload on other employees or result in missed safety-critical functions, which could degrade systems that potentially impact safety. In organizations that must continually run to tight schedules, like the one surveyed in this study, these factors could adversely affect reliability as well as safety.

To further clarify how risk exposure, OID, and empowerment can predict safety participation, reported intention to quit, and absenteeism, the current study incorporated physical and psychosocial safety climate as moderators, due to their found influence on employee attitudes and behaviors (Clarke, 2006a; Mark et al., 2007). Exploring these variables within a transport and logistics sample is important, as the effectiveness of organizations in this sector is predicated on positive safety climates and employee safety behaviors (Glendon and Evans, 2007). Findings on the relationship between risks, attitudes, and safety could enhance management effectiveness by reducing turnover and absenteeism, and improving safety behaviors.

1.2. Risk exposure

Despite increasing focus on safety, annually in Australia some 118,000 people are seriously injured at work (Safe Work Australia, 2015), and around 260 die from work-related injuries (Safe Work Australia, 2016). As well as increasing injury likelihood, risk exposure influences employee attitudes about safety in their organization (Ford and Wiggins, 2012; Henning et al., 2009; Itoh et al., 2004). Conflicting associations between risks and absenteeism have been either positive (Harrison and Martocchio, 1998), or negative (Ose, 2005), or show null effect (Roelen et al., 2006). A study of Netherlands' transportation workers found the hazard–absence relationship to be moderated by supervisor support (Biron and Bamberger, 2012), which is tested in the current study. The study sought to clarify some associations between risk exposure, OID, psychological empowerment, safety participation, reported intention to quit, and absenteeism (Abrams et al., 1998; Alge et al., 2006; Ford and Tetrick, 2011; Harris and Cameron, 2005; Mael and Ashforth, 1992, 1995; Riketta, 2005; van Knippenberg and van Schie, 2000).

H1. Risk exposure will be associated positively with: (a) safety participation, and negatively with: (b) reported intention to quit, and (c) absenteeism.

1.3. Organizational identification

Organizational identification (OID) describes the degree to which individuals define themselves, and seek personal identity, through their employment (Ashforth et al., 2008; Ashforth and Mael, 1989; Boros, 2008; Tyler and Blader, 2003). Detrimental effects that both low and high OID can have on employees and organizations have been investigated (Avanziet al., 2012; Smith et al., 2012). Ford and Tetrick (2011) found that employees who identified highly with their organization, and who felt that they had high levels of influence over their work, were more likely to perform safety enhancing behaviors, including safety participation. Ford and Tetrick highlighted OID as important in creating a positive safety climate. A more generalized effect of OID on both work attitudes and workplace behaviors has also been found (Lee et al., 2015).

OID has been associated with turnover intent, absenteeism, and organizational support (Mael and Ashforth, 1992, 1995; van Knippenberg and van Schie, 2000). A negative relationship has been found between OID and intention to quit (Abrams et al., 1998; Harris and Cameron, 2005; Riketta, 2005; Scott and Stephens, 2009). Randsley de Moura et al. (2009) found that OID was an important antecedent of turnover intentions, impacting organizations' turnover costs (Shaw, 2011). Absenteeism effects may be felt through reduced productivity as well as increased workloads and stress for other employees. While some studies have found higher OID to be associated with lower absenteeism (van Dick and Wagner, 2002; van Dick et al., 2005), in a meta-analysis Riketta (2005) found no association between OID and absenteeism.

H2. Organizational identification will be associated: (a) positively with safety participation, and negatively with: (b) reported intention to quit, and (c) absenteeism.

1.4. Psychological empowerment

Developed from Hackman and Oldham's (1980) motivational theories and Bandura's (1977) self-efficacy theory, subsequent conceptualizations (Maynard et al., 2012) have resulted in a 4-dimensional construct of psychological empowerment (Spreitzer, 1995). Within a workplace context, empowerment has been defined as an intrinsic work role orientation in which individuals feel that they have the capacity to shape their work role and context (Spreitzer, 1995). Four cognitive features shaped by the work environment are: meaning, competence, self-determination, and impact (Ashforth, 1989; Deci et al., 1989; Gist, 1987; Spreitzer, 1995; Thomas and Velthouse, 1990). As impact describes the extent to which an individual can influence work outcomes (Ashforth, 1989), in the current study, which was concerned with work outcomes, this feature was operationalized. It suggests that if employees feel a sense of control, then they are more committed and intrinsically motivated, resulting in higher empowerment and safety performance (Alge et al., 2006; Ford and Tetrick, 2011; Hechanova-Alampay and Beehr, 2001; Roseman et al., 2017). Employees with low job control have a poor perception of management's safety commitment (Pinion et al., 2017). Important implications include lower work performance, and damage to organizational reputation (Spreitzer, 1995; Staw and Epstein, 2000).

The relationship between empowerment and commitment is strengthened when employees perceive that the organization values their contribution and well-being (Butts et al., 2009; Hechanova-Alampay and Beehr, 2001; Liden et al., 2000). Finding a negative association between empowerment and intention to quit, Seibert et al. (2011) suggested that employees saw empowering work as motivating organizational commitment, thereby increasing loyalty and reducing turnover. Hochwälder and Brucefors (2005) found that employees with higher empowerment reported fewer sick days. Empowerment has also been associated negatively with unsafe behavior and workplace injuries (Hechanova-Alampay and Beehr, 2001). Ford and Tetrick (2011) found empowerment to be associated positively with safety participation and safety performance.

H3. Psychological empowerment (impact) will be associated: (a) positively with safety participation, and negatively with: (b) reported intention to quit, and (c) absenteeism.

1.5. Supervisor safety practices

Managerial and supervisor support is important for an organization's safety climate (Clarke, 2006a; Ford and Tetrick, 2011). As well as

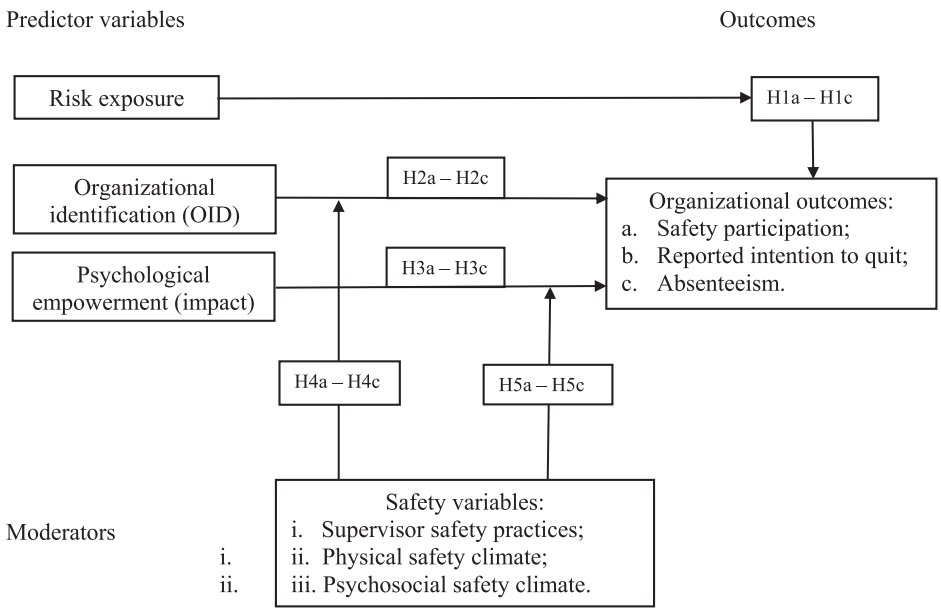

Fig. 1. Conceptual model of psychological and safety relationships.

being responsible for communicating safety policies and practices, managers and supervisors are a critical social influence on employees' safety behaviors (Credo et al., 2010; Leroy et al., 2012; Lofquist et al., 2011; Zohar, 2000; Zohar and Luria, 2005). Studying team members' engagement in safety-related helping, Hofmann et al. (2003) found that the more committed to safety employees perceived their supervisors to be, the more likely was it that employees would engage in positive safety behaviors. Hofmann et al. (2003) concluded that leaders were key to developing positive safety climates, inter alia, emphasizing safety performance and participation. Clarke (2013) identified different leadership styles as important to employee safety participation, with safety climate mediating the relationship between safety leadership and safety participation. Examining the potential moderating effect of supervisor practices on the relationship between OID and safety performance, Ford and Tetrick (2011) found a moderator effect for PPE use but not for safety participation.

1.6. Physical and psychosocial safety climate

Safety climate has been found to influence organizational behaviors and outcomes, including safety performance, and safety participation (Clarke, 2006a; Ford and Tetrick, 2011; Griffin and Neal, 2000; Zohar, 2000). Physical safety climate refers to employees' perceptions and attitudes in relation to workplace hazards, for example, equipment use, and work space (Zohar, 2000). Psychosocial safety climate refers to shared perceptions regarding policies and procedures for protecting workers' psychological health, including co-worker relationships and stress (Idris et al., 2012). When employees perceive high management commitment to safety, both forms of safety climate will be rated positively.

Poor safety climate and greater perceived safety risks have been associated with more unsafe behaviors, increased injury-related absenteeism, and low organizational commitment (Clarke, 2010; Johnson, 2007; Morrow and Crum, 1998; Seo, 2005; Tharaldsen et al., 2008). Improved safety participation is evident when employees perceive more favorable safety practices (Hofmann and Stetzer, 1996). Others have found no direct relationship between safety climate and safety behaviors (Glendon and Litherland, 2001). Clarke (2006b) found that while safety climate did not directly predict unsafe workplace behavior or injuries, employee perceptions of the work environment were strong predictors of safety outcomes, suggesting that individual-level factors influence safety behavior more than they do safety climate.

Clarke's (2006a) meta-analysis suggested a moderator role, such that safety climate had the greatest effect on safety participation when employees perceived themselves to be more autonomous and empowered. Mark et al. (2007) found that greater employee engagement and autonomy, combined with more positive safety climate, predicted fewer injuries. Direct and moderator effects have also been found for psychosocial safety climate, which can have long-term effects on psychological health (Dollard et al., 2012a). Clarke (2010) found poor psychosocial climate to be associated with low safety participation and injuries. Dollard and Bakker (2010) found that psychosocial safety climate moderated the relationship between emotional work demands and psychological health, with this relationship weakening as psychosocial safety climate increased. Other research has argued that psychosocial safety climate ameliorates the effect of work demands and psychological stressors on safety and psychological health (Dollard et al., 2012b).

To contribute to the literature on moderator effects of perceived supervisor safety practices and other safety variables (Ford and Tetrick, 2011), the study examined the potential moderating role played by safety variables in associations between OID, psychological empowerment, and organizational outcomes.

H4. (i) perceived supervisor safety practices, (ii) physical safety climate, and (iii) psychosocial safety climate, will moderate the relationships between OID, and: (a) safety participation – stronger when moderators are higher, (b) reported intention to quit, and (c) absenteeism – both weaker when moderators are lower.

H5. (i) Perceived supervisor safety practices, (ii) physical safety climate, and (iii) psychosocial safety climate, will moderate the relationships between psychological empowerment, and: (a) safety participation – stronger when moderators are higher, (b) reported intention to quit, and (c) absenteeism – weaker when moderators are lower.

The hypotheses are summarized in Fig. 1.

2. Methods

2.1. Participants

Participants were employed at the same middle management level

Table 1
Operationalization of variables.

Concept	Level	Illustrative questions	Comments
Risk exposure	Department/Team	• Complete a risk matrix for five areas within your sphere of responsibility	These differed for each respondent, depending upon their area of responsibility and the attendant risks (e.g., physical, health, business, legal). The rationale was that each respondent would identify those area of greatest importance to their particular managerial role
Organizational identification	Individual	• When someone criticises my organization, it feels like a personal insult • My organization's successes are my successes	In the questionnaire, the actual name of the organization is substituted for "my organization" so that the items become directly relevant to the respondent
Employee empowerment	Individual	• My job activities are personally meaningful to me • I have a lot of control in determining how I do my job • I am confident about my ability to perform my work activities • I have significant voice over what happens in my department	These generic questions can be applied to almost any employee in any large or medium-sized organization
Supervisor safety practices	Department/Team	• My manager recognises employees when they see a job done according to the safety rules • My manager approaches employees during work to discuss safety issues • Whenever pressure builds up, my manager wants us to work faster, rather than by the rules (reversed item)	As these items reflect the way in which respondents perceive how their particular direct report manages key aspects of safety, they could represent different managerial styles, strategies, or priorities within the organization. The aim with these questions is to tap into how each respondent perceives how their own manager manages key aspects of safety
Physical safety climate	Organization/ Department/Team	• Plant and equipment are maintained to a safe standard • Managers demonstrate a high level of safety behavior • Management looks for underlying factors that contribute to safety incidents rather than blaming people involved • Training is received at regular intervals to refresh and update knowledge • Safety rules and procedures are easy to use during normal operations	These questions are likely to reflect respondents' perceptions of: 1) their immediate managerial report, and 2) at the highest managerial level within the organization. Therefore, they are likely to access a range of managerial safety priorities
Psychosocial safety climate	Organization/ Department/Team	• In my workplace senior management act quickly to correct problems/issues that affect employees' psychological health • Senior management consider employee psychological health to be as important as productivity • Employees are encouraged to become involved in psychological safety and health matters	As for physical safety climate, these items are likely to reflect respondents' views of their immediate managerial report, and also of the highest managerial level within the organization. Therefore, they are likely to access a range of managerial priorities on psychosocial aspects of safety
Safety participation	Individual	• I assist others to make sure they perform their work safely • I get involved in safety activities to help other staff members work more safely • I express opinions on safety matters even if others disagree	These questions are designed to reflect each individual respondents' actions and perspectives on safety. In self-report instruments, individualized outcomes are likely to be more reliably measured than those at other levels
Intention to quit	Individual	• In the next few years I intend to leave this organization • I would like to work for this organization until I retire (reversed item)	In the questionnaire, the actual name of the organization is substituted for "my organization" so that the items become directly relevant to the respondent. As with the safety participation items, in self-report instruments, individualized outcomes are likely to be more reliably measured than those at other levels
Absenteeism	Department/Team	• A 12-months mean hours' unplanned absence per full-time employee in each team/department was created as a normally distributed variable	As the only one to be measured independently of the survey, this variable was presumed to reflect a respondent's ability to manage employee absence within their own team/department

in a large Australian transport and logistics organization, with whom the first author was completing work experience at the time of the study. Of 524 distributed to all middle managers, 205 completed surveys were returned (response rate 39%). Respondents worked in eight functions (Business Sustainability 22.9%, Operations 18.5%, Network 17.1%, Human Resources 16.6%, Enterprise Services 10.7%, Finance 6.3%, Commercial and Marketing 5.4%, Strategy and Business Development 2.4%). The relevance of sampling respondents at this level across different functional areas was their general and specific responsibility for managing a wide range of risks across the organization.

2.2. Measures

In seeking scales to adequately assess respondents' perceptions of various organizational issues, prime selection criteria were: prior evidence of good validity and reliability, and brevity – with the aim of maximizing response rate for a particularly time-scarce employee demographic. The survey included 77 questions within nine scales. Table 1 summarizes how the concepts were measured, the implicit level at which responses were obtained, some illustrative items, and comments on the nature of each variable.

2.2.1. Predictors

Risk exposure. Risk exposure was measured by respondents completing risk matrices for up to five key risks that were relevant to their particular supervisory area. All respondents were familiar with these risk matrices from existing organizational safety practices. Each matrix provided a rating for the identified risk of between 1 and 36, which were summed to give a total potential score of between 1 and 180. The

Table 2
Means, standard deviations and correlations between variables (N = 205).

	Mean	*SD*	α	1	2	3	4	5	6	7	8
Criterion Variables											
1. Safety participation	5.45	1.17	*.96*								
2. Intention to quit	4.11	1.56	*.78*	−.12							
3. Absenteeism	4.07	1.92	–	.28**	−.06						
Explanatory Variables											
4. Risk exposure	71.79	32.60	–	.29**	.08	.11					
5. Organizational identification	5.22	0.98	*.85*	.34**	−.39**	.06	.03				
6. Empowerment (impact)	4.93	1.41	*.91*	.13	−.32**	.14*	−.07	.31**			
7. Supervisor safety practices	5.51	1.02	*.87*	.33**	−.38**	.02	.02	.34**	.31**		
8. Physical safety climate	5.77	0.97	*.89*	−.04	−.39**	−.07	−.16*	.41**	.34**	.51**	
9. Psychosocial safety climate	4.01	1.56	*.95*	.13	−.36**	.02	−.10	.31**	.35**	.46**	.48**

* $p < .05$.
** $p < .01$.

higher a risk exposure score, the greater the overall risk within the work environment a respondent perceived themselves and their subordinates to be exposed to. The variable was normally distributed. This measure's mean and standard deviation (see Table 2) reflected the diversity of risks encountered and managed by this respondent sample.

Organizational identification (OID) was measured using a version of Mael and Ashforth's (1992) 6-item scale, modified for an organizational environment. It has good internal consistency (α range .81–.89; Boros, 2008; Ford and Tetrick, 2011; Mael and Ashforth, 1995). Means were derived by aggregating item scores and dividing by number of items.

Psychological empowerment, operationalized as impact, was measured using a 4-item unidimensional version of Spreitzer's (1995) scale, which Spreitzer reported had good reliability (α .93), and which has been validated with other samples (Alge et al., 2006). Mean scores were derived as for OID.

2.2.2. Moderators

Perceived supervisor safety practices were measured using a 5-item version of Zohar's (2000) group safety climate scale. A 6-item scale was reported by Ford and Tetrick (2011) to have excellent internal consistency (α .90). Respondents reported on their own manager's safety practices. Mean scores were derived as for OID.

Physical safety climate was measured using a 5-item version of Glendon and Evans' (2007) rail safety climate scale measuring two dimensions: management and maintenance, and training and rules/procedures, which these authors found had high internal consistency (αs .93, .91, respectively). The scale has been validated in samples very similar to those in the current study (e.g., Darling et al., 2004). Mean scores were derived as for OID.

Psychosocial safety climate was measured using a 4-item scale derived from Hall et al. (2010), which these authors reported as having good internal consistency (α .94). In the current study, items reflected senior management commitment to employees' psychological health. Mean scores were derived as for OID.

2.2.3. Outcomes

Safety participation was measured using a 4-item version of Ford and Tetrick's (2011) 6-item modified version of Hofmann et al.'s (2003) measure of safety citizenship. Ford and Tetrick reported high reliability (α .94) and good validity for the modified scale. Mean scores were derived as for OID.

Intention to quit was measured with Abrams et al.'s (1998) 4-item scale (α. 88), which has been well-validated (Randsley de Moura et al., 2009). Mean scores were derived as for OID. Scale means, standard deviations, and Cronbach alphas for the current sample are in Table 2.*Absenteeism*. The organization provided details of 12 months' unplanned absenteeism data, measured as total number of hours' absence, for all employees in each respondent's work unit. A normally distributed variable was created by grouping average hours' absence.

2.3. Procedure

Approval was obtained from the authors' University Human Research Ethics Committee. Ten employees from the same level as those comprising the main sample piloted an online version of the questionnaire to assess face validity issues and item clarity, with feedback resulting in minor changes. The final online questionnaire was distributed by email from the first author.

2.4. Data analyses

After being de-identified, the data were entered into SPSS v21.0 for analysis. While distributions for the scaled variables had mild negative skew and positive kurtosis (Tabachnick and Fidell, 2013), as transformations did not materially alter the results from the respective analyses the original data were used for all subsequent analyses.

As initial Baron and Kenny (1986) derived analyses (results available from the authors on request) showed no mediating effects for either OID or empowerment, multivariate analyses focused on direct and moderated effects. Interaction terms were created by multiplying the paired centred predictor and moderator variables to examine the potential moderating effects of supervisor safety practices, physical safety climate, and psychosocial safety climate on the relationship between the predictors (OID, empowerment), and criterion variables (safety participation, reported intention to quit, absenteeism).

3. Results

3.1. Correlations and multiple regression analyses

Bivariate correlations (Table 2) and multiple regression analyses examined H1-H3, with alpha set at .05 for all analyses. Risk exposure was positively associated with safety participation (H1a), but was not associated with either reported intention to quit (H1b), or with absenteeism (H1c). OID was associated with safety participation (H2a), and associated negatively with reported intention to quit (H2b). However, contrary to H2c, OID was not associated with absenteeism. While it was not associated with safety participation (H3a), as predicted, empowerment (impact) was negatively associated with intention to quit (H3b). Contrary to H3c, empowerment was positively, albeit weakly, associated with absenteeism. Three standard multiple regression analyses investigated the influence of risk exposure, OID, and empowerment on safety participation, intention to quit, and absenteeism (Table 3).

The first model accounted for 18.4% (adj. R^2) of variance in safety participation, $F(3, 201) = 16.36$, $p < .001$. Supporting H1a, risk

Table 3
Regression of safety participation, reported intention to quit, and absenteeism on risk exposure, organizational identification, and empowerment.

Variables	*B*	*SE(B)*	β	*p*	*Adj* R^2
Safety participation					
Risk exposure	0.010	0.002	.29	–***	
Organizational identification	0.372	0.079	.31	–***	
Empowerment (impact)	0.043	0.055	.05	.44	.18***
Reported intention to quit					
Risk exposure	0.004	0.003	.08	.23	
Organizational identification	−0.523	0.105	−.33	–***	
Empowerment (impact)	−0.232	0.073	−.21	.002	.19***
Absenteeism					
Risk exposure	0.007	0.004	.12	.10	
Organizational identification	0.013	0.143	.01	.93	
Empowerment (impact)	0.204	0.099	.15	.04	.02

*** $p < .001$.

exposure explained 8.3% of variance in safety participation. Supporting H2a, OID explained 8.5% of variance in safety participation. Contrary to H3a, empowerment did not explain unique variance in safety participation.

The second model accounted for 18.9% (adj. R^2) of the variance in reported intention to quit, $F(3, 201) = 16.90$, $p < .001$. H1b was not supported, as risk exposure was not associated with reported intention to quit. H2b and H3b were supported, with OID explaining 9.9% of unique variance, and empowerment explaining 3.9% of unique variance, in reported intention to quit. Higher OID and empowerment were both associated with lower intention to quit.

In the third model, despite a slight association with empowerment, none of the hypothesized predictors were significantly associated with absenteeism, so that H1c, H2c, and H3c were not supported by this analysis.

3.2. Moderated hierarchical regression analyses

In the hierarchical regression analyses, the centred predictor and moderator variables were entered at step 1, and the interaction terms at step 2. Simple slopes analyses were conducted for significant interactions (Aiken and West, 1991).

To examine the potential moderating effect of the safety variables, of three hierarchical regressions, there was only one significant moderator effect (Table 4). Overall, 32.3% (adj. R^2) of the variance in safety participation was accounted for by the predictor variables, $F(7, 197) = 14.91$, $p < .001$. At step 1, the predictor variables accounted for 30.0% (adj. R^2) of the variance, $F(6, 198) = 15.54$, $p < .001$. Including the interaction term at step 2 accounted for additional variance, $F_{chg}(1, 197) = 7.85$, $p = .006$, indicating a moderator effect for the empowerment × perceived supervisor safety practices interaction (H4ia, H5ia). Simple slopes analyses revealed that the line representing negative perceived supervisor safety practices did not differ significantly from zero ($b = -.09$, $t = -1.18$, $p = .241$), but that the line representing positive perceived supervisor safety practices did differ significantly from zero ($b = .30$, $t = 2.89$, $p = .004$). This indicated that, as predicted, empowerment was positively associated with safety participation, but only under conditions of perceived positive supervisor safety practices (H5ia, Fig. 2).

Overall, 24.6% (adj. R^2) of the variance in reported intention to quit was accounted for by the predictor variables, $F(7, 197) = 10.53$, $p < .001$. At step 1, the predictor variables accounted for 24.9% (adj. R^2) of the variance, $F(6, 198) = 12.27$, $p < .001$. Including the interaction term at step 2 accounted for no additional variance, $F_{chg}(1, 197) = 0.34$, $p = .56$, indicating no moderator effect (H4b, H5b).

Overall, 1.5% (adj. R^2) of the variance in absenteeism was accounted for by the predictor variables, $F(7, 197) = 1.45$, $p = .19$. At step 1, the predictor variables accounted for 1.5% (adj. R^2) of the variance, $F(6, 198) = 1.52$, $p = .18$. Including the interaction term at step 2 accounted for no additional variance, $F_{chg}(1, 197) = 1.05$, $p = .31$, indicating no moderator effect (H4c, H5c).

4. Discussion

This study aimed to investigate how broadly-based risk exposure was associated with the psychological factors of OID and empowerment (impact), as well as the outcomes of safety participation, reported intention to quit, and absenteeism, within a transport and logistics organization. It examined potential moderating influences of some safety variables. Results partially supported Ford and Tetrick's (2011) workplace safety model.

4.1. OID, psychological empowerment, and organizational outcomes

As predicted, OID was associated positively with safety participation (H2a), and negatively with reported intention to quit (H2b). As found previously, respondents were more likely to participate in safety activities and encourage others to work safely, as well as be less likely to report intending to quit, when they identified more with the organization (Ford and Tetrick, 2011; Randsley de Moura et al., 2009; Tyler and Blader, 2003). However, OID was not associated with absenteeism

Table 4
Hierarchical regressions for outcome and predictor variables.

Variables in equation	Safety participation				Reported intention to quit				Absenteeism			
	B	*SE(B)*	β	*p*	*B*	*SE(B)*	β	*p*	*B*	*SE(B)*	β	*p*
Step 1: Risk exposure	0.008	0.002	.23	–***	0.003	0.003	.05	.40	0.005	0.004	.09	.20
Organizational identification	0.388	0.079	.33	–***	−0.355	0.109	−.22	.001	0.104	0.154	.05	.50
Empowerment (impact)	0.039	0.052	.05	.46	−0.124	0.072	−.12	.09	0.209	0.102	.16	.04
Supervisor safety practices	0.412	0.083	.36	–***	−0.232	0.115	−.15	.05	0.014	0.162	.01	.93
Physical safety climate	−0.429	0.092	−.36	–***	−0.184	0.126	−.12	.m15	−0.286	0.178	−.15	.11
Psychosocial safety climate	0.033	0.054	.05	.53	−0.117	0.074	−.12	.12	0.033	0.104	.03	.75
Step 2: Risk exposure	0.007	0.002	.21	.001	0.003	0.003	.06	.36	0.005	0.004	.08	.25
Organizational identification	0.374	0.078	.31	–***	−0.351	0.110	−.22	.002	0.094	0.155	.05	.54
Empowerment (impact)	0.075	0.053	.09	.16	−0.134	0.076	−.13	.07	0.236	0.105	.18	.03
Supervisor safety practices	0.447	0.083	.39	–***	−0.243	0.117	−.16	.04	0.040	0.164	.02	.81
Physical safety climate	−0.428	0.090	−.36	–***	−0.184	0.127	−.12	.15	−0.285	0.178	−.14	.11
Psychosocial safety climate	0.029	0.053	.04	.59	−0.115	0.074	−.12	.12	0.029	0.104	.02	.78
Empowerment × Supervisor safety practices	0.117	0.042	.17	.01	−0.034	0.059	−.04	.56	0.084	0.082	.08	.31
Step 1 *Adj* R^2 (F, R^2); Step 2 *Adj* R^2 (F_{chg}, R^2_{chg}); *** $p < .001$	.30 (15.54***, .32); .32 (7.85, .03) $p = .006$				.25 (12.27***, .27); .25 (0.34, .001) $p < .001$				.02 (1.52, .04); .02 (1.05, .01) $p = .187$			

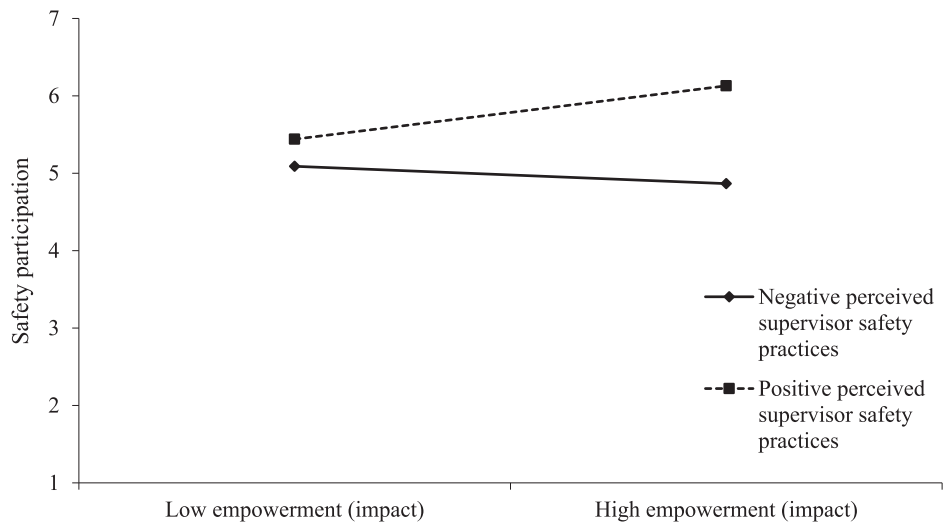

Fig. 2. Perceived supervisor safety practices as a moderator of the relationship between empowerment (impact) and safety participation.

(H2c), a result consistent with Riketta (2005), though contradictory to van Dick and Wagner (2002), and van Dick et al. (2005). As empowerment did not explain unique variance in safety participation (H3a), our results were counter to those of Ford and Tetrick (2011), and of Hechanova-Alampay and Beehr (2001). Empowerment was associated negatively with reported intention to quit, as found by Seibert et al. (2011). Contrary to Hochwälder and Brucefors (2005), in the current study a relatively weak association was found between empowerment and absenteeism (H3c).

4.2. Moderator effects

While support was found for a moderating effect of perceived supervisor safety practices on the relationship between empowerment and safety participation (H5a), contrary to Ford and Tetrick's (2011) finding on PPE use, no support was found for moderator effects of any of the three safety variables upon OID for any of the criterion variables (H4a–H4c). As neither form of safety climate moderated the effect of empowerment on any of the outcome variables, no support was found for either H5b or H5c. Other outcomes may pertain with samples from various organizational levels when considering evidence that safety climate operates differently at group and organizational levels (Glendon, 2008; Zohar and Luria, 2005).

As predicted, the relationship between empowerment and safety participation was stronger when supervisor safety practices were perceived to be more positive (H5a, Fig. 2 and Table 4). This finding extended Ford and Tetrick (2011), who found a moderator effect of perceived supervisor safety practices on PPE use, although not for safety participation. The association between empowerment and safety participation did not persist when respondents perceived more negative supervisor safety practices. This finding suggested that empowerment did not improve safety participation if employees perceived management to be uncommitted to safety. However, empowerment is more likely to encourage employees to achieve safety goals if senior management is perceived to prioritize safety (Ford and Tetrick, 2011; Zohar, 2000). Despite evidence indicating that absenteeism is influenced by management treatment of employees (Biron and Bamberger, 2012), none of the hypothesized moderator variables influenced the relationship between empowerment and absenteeism (H5c).

4.3. Revised model

The results for the current sample led to a revised simplified model (Fig. 3) to describe relationships between the variables more

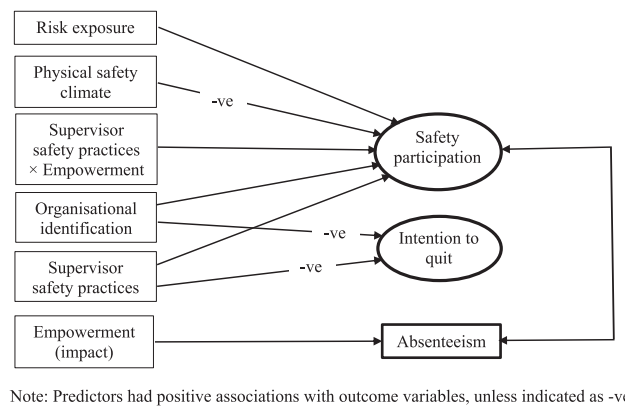

Fig. 3. Revised simplified model showing predictors and organizational outcomes. Note: Predictors had positive associations with outcome variables, unless indicated as −ve.

parsimoniously than the hypothesized model did. The model shows that risk exposure, OID, perceived supervisor safety practices, and physical safety climate (negatively), as well as the interaction between empowerment and supervisor safety practices, explained unique variance in safety participation. A direct effect of high OID on safety-enhancing behaviors is shown, including influencing others to behave safely, and actively managing safety (Ford and Tetrick, 2011). Consistent with Hofmann et al. (2003), the more respondents perceived their manager to be committed to safety, the more likely would they report engaging in positive safety behaviors. Although inconsistent with the null effect found by Ford and Tetrick (2011), the positive association between risk exposure and safety participation suggested that the higher the risk in the work environment, the more likely respondents were to report engaging in positive safety behaviors. This inconsistency may be due to sample differences, where Ford and Tetrick (2011) used a sample comprising mostly frontline employees, the current study sampled supervisory employees, who therefore had greater overall responsibility for risk control and safety management.

While some evidence suggests that, for shopfloor employee samples, negative safety climate may be associated with relatively higher injury and accident rates (Clarke, 2006a, 2010; Seo, 2005), a perceived negative organization-level safety climate might motivate managerial employees to enhance safety within their area of responsibility. Thus, for this sample, the organization's safety context, and employee attitudes towards its safety policies and practices, may have been associated with managerial employees independently engaging in positive safety behaviors.

The revised model also showed that OID and supervisor safety practices explained unique variance in intention to quit, with both being negatively associated. As suggested by previous research, the greater the connection employees feel with an organization, the less likely are they to quit their job (Randsley de Moura et al., 2009; Seibert et al., 2011). However, unlike these studies, despite empowerment showing a correlation with reported intention to quit, the regression analyses indicated that empowerment was not a unique predictor, perhaps due to one or more suppressor effects among the predictor variables. It may be relevant that the study was conducted immediately prior to a major organizational restructure, which affected many respondents so that their intentions to quit might already have been relatively high, generating a potential ceiling effect for this variable, and possibly attenuating the likelihood of identifying any association that the predictor variables might otherwise have manifested. This highlights the potential importance of local and temporal context upon the expression of key variables in organizational research.

The revised model also revealed a weak association between empowerment and absenteeism, which suggested that absenteeism was influenced by a number of other factors. The finding is consistent with contradictory evidence for the relationship between OID, empowerment, and absenteeism (Hochwälder and Brucefors, 2005; Riketta, 2005; van Dick et al., 2005).

4.4. Limitations, strengths, and implications for future research and practice

Study limitations included those traditionally associated with survey research, namely cross-sectional design, self-report data, sample specificity, and common method variance (Podsakoff et al., 2003). However, self-report data measure perceptual constructs that are unavailable through other methods, and are the most common method for assessing safety performance (Christian et al., 2009). To counter this limitation, independently-derived absenteeism records were matched with the self-report data. In the second author's experience of surveying across many organizations in different countries, our response rate was not untypical of organizational response rates, which may be as low as 20%, or even lower (and seldom reported when such studies are published). It is notoriously difficult to persuade busy managers, or other employees to devote time to completing a survey in whose outcome they have no personal stake or direct interest – and indeed, given the inherent conflict within all or most organizations, that they might even see as potentially detrimental to their interests. The response rate in this survey may have influenced study outcomes as those responding may have been in more administrative roles with a greater opportunity to respond and therefore may have had less exposure to the operational functions of the organization.

However, by operationalizing variables that effectively accessed different levels – organizational (physical and psychosocial safety climates), departmental/team (risk exposure, supervisor safety practices, physical and psychosocial safety climates), and individual (OID, employee empowerment, safety participation, intention to quit), as well as independent absenteeism data (at departmental/team level), the research captured a broader set of measures than may be available in many organizational studies. The study was also atypical in gathering data from managerial/supervisory level respondents.

The way in which absenteeism was measured is a likely reason for the null effects found for this variable. As absenteeism was the only variable to be measured independently, it is likely that the present study's attempt to reduce common method variance restricted the likelihood of obtaining significant effects for this variable (Tabachnick and Fidell, 2013), probably due to a "floor effect" that reflected the low mean figure from the sample obtained compared with that for the whole organization. The effects of OID and empowerment on employee absenteeism has differed extensively in previous studies, warranting further research with more homogenous samples.

The study extended previous research by adding further antecedent safety variables (physical and psychosocial safety climate, supervisor safety practices), and organizational outcomes (intention to quit, absenteeism) to Ford and Tetrick's (2011) workplace safety model, accounting for further variance in organizational outcomes. The transport and logistics industry had not previously been explored in relation to a combined model of safety, OID, and empowerment, thereby allowing for testing a contrasting sample. Studies involving managerial employees are uncommon in safety research, although managers in the transport sector may misperceive workplace risk and safety issues (Gao et al., 2017).

The study provided further support for associations between occupational risks, employee attitudes, and safety perceptions and behaviors (Ford and Tetrick, 2011). While much of the OID and empowerment literature has focused on absenteeism as an important outcome (Hochwälder and Brucefors, 2005; Riketta, 2005; van Dick et al., 2005), the present study suggested a need for more robust measures of organizational and individual performance, for example combining such factors as absenteeism, presenteeism, and work quality (Prater and Smith, 2011; van Dick et al., 2006). The study revealed the contrast between finding relationships between scaled measures developed by organizational researchers, and the more problematic search for associations between these variables and independent organizational measures, in this case absenteeism. Also highlighted were difficulties in finding moderator effects (McClelland and Judd, 1993).

Future research would ideally design empirically robust methodologies that can contribute further to developing sound theoretical underpinnings for organizational safety, OID, and empowerment, exploring revised models with samples from different organizations and industry sectors. Research could also examine safety models using hierarchical and longitudinal data that capture employee attitudes and behaviors across chains of command and spans of control, to assist in explaining further variance in key organizational constructs.

In terms of practical applications, since the research described in this paper was completed, the organization from which the sample was drawn have implemented a number of programs focusing on leadership and culture, which sought to arm leaders with tools to understand safety, and to encourage a culture of felt leadership. These programs stressed the importance of organizations focusing on empowering their managers with tools and knowledge to embed or foster a positive safety culture. Since taking on a customer service role within the organization, the first author has observed that customers often speak to her about the reasons why they choose an organization – in particular safety and the organization's culture, noting that, "Often when a customer notices an employee behaving in an unsafe manner, they question our culture as a whole … Same goes for recruitment, employees want to work for a company that has a strong safety culture in our industry and want to be led".

Safety and culture become increasingly important, not only in employer choice for potential recruits, but also in terms of choice of service provider for transport and supply chain industry consumers. Thus, organizations need to find ways of setting themselves apart from their market competitors – that is, to become more distinctive, which is one aspect of OID. The research may also contribute to further practical applications within leadership training and education, particularly for senior management, as they embed a culture of commitment to corporate values, such as safety, which further spread through organizational chains of command.

The research highlighted associations between employee attitudes and management commitment to safety. When employees are engaged in high quality relationships with management, and perceive a leader to be committed to safety, they are likely to engage in positive safety behaviors (Credo et al., 2010; Zohar, 2000). As managers internalize the organization's safety policies, employees are likely to perceive greater management commitment to safety, and to develop more positive attitudes towards behavior change (Lofquist et al., 2011). As well as reinforcing the importance of general organizational policies to

implement practices that foster increasing OID and employee empowerment, the findings indicated that for this organization, increased attention to physical safety climate, and supervisor safety practices would be among the ways in which greater employee participation in safety might be achieved. Enhancing organizational identification as well as improving supervisory safety practices might be expected to lead to reduced intention to leave the organization for the sampled employee demographic.

Conflict of interest

While declaring no conflict of interest in respect of the contents or publication of this article, the first author took up full-time employment with the organization subsequent to the research described being completed, and at the time of writing this article was employed at a different location with the organization. This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Appendix A. Supplementary material

Supplementary data associated with this article can be found, in the online version, at http://dx.doi.org/10.1016/j.ssci.2018.02.012.

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