

Perceived Organizational Support for Safety and Employee Safety Voice: The Mediating Role of Coworker Support for Safety

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In the present study, we modeled 2 sources of safety support (perceived organizational support for safety and perceived coworker support for safety) as predictors of employee safety voice, that is, speaking out in an attempt to change unsafe working conditions. Drawing on social exchange and social impact theories, we hypothesized and tested a mediated model predicting employee safety voice using a cross-sectional survey of urban bus drivers ($n = 213$) in the United Kingdom. Hierarchical regression analysis showed that perceived coworker support for safety fully mediated the relationship between perceived organizational support for safety and employee safety voice. This study adds to the employee voice literature by evaluating the important role that coworkers can play in encouraging others to speak out about safety issues. Implications for research and practice related to change-oriented safety communication are discussed.

Keywords: bus drivers, coworkers, proactivity, safety, voice

Attempts made by frontline workers to change unsafe working conditions can have implications for their own physical safety, the safety of their coworkers, and organizational safety performance. Although speaking out about safety concerns is important to

injury prevention (e.g., Hofmann & Morgeson, 1999), research on the correlates of employee safety voice, which we define as any individual communication directed at improving safety conditions, is sparse. This paper examines the nature of employee safety voice by considering two conceptually relevant predictors, namely perceived organizational support for safety and perceived coworker support for safety.

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We presented earlier versions of this study at the Industrial Accident and Prevention Association's 2006 Conference and Trade Show, Toronto, Ontario, Canada, and the 7th European Academy of Occupational Health Psychology, Dublin, Ireland. Funding from the Social Sciences and Humanities Research Council of Canada, the United Kingdom Health and Safety Executive, and the Toller Family Research Fellowship helped to make this collaboration possible. All authors contributed equally to this article. We thank the anonymous organization and its employees for their participation, and Maggie Holmes, Krits Sarma, and Ruth Stacey for assistance in the conduct of this study. We thank Julian Barling, Alyson Byrne, Tony Carroll, Amy Christie, Heather Dezan, Colette Hopton, Catherine Shea, Christine Silva, Ralph Stratton, and three anonymous reviewers for constructive feedback on earlier drafts of this paper.

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Although job-related safety communication has been studied in the past decade (e.g., Hofmann & Stetzer, 1998; Zohar & Luria, 2003), the primary focus has been on top-down communication to the relative exclusion of other targets and sources. For instance, attempts by frontline workers to improve safety may involve appeals not only to targets such as managers, but also coworkers. With prior research showing that peers have a strong influence on some safety behaviors (e.g., Andriessen, 1978; Cree & Kelloway, 1997; Westaby & Lowe, 2005), we believe that investigating coworkers as sources of social influence on employee safety voice merits attention. Drawing on conceptual ideas from the social influence literatures, we describe and test a model of employee safety voice in which the relationship between perceived organizational support for safety and employee safety voice is mediated by perceived coworker support (see Figure 1).

The paper is organized as follows. First, we introduce and define the domain of employee safety voice.

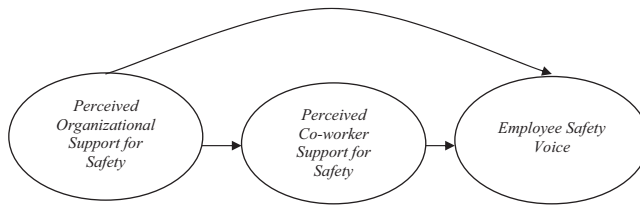


Figure 1. Proposed mediation model: Perceived organizational support for safety, perceived coworker support for safety, and employee safety voice.

Second, we develop a conceptual model of social influences on employee safety voice. Third, using a sample of urban bus drivers in the United Kingdom, we test our model while controlling for relevant individual differences. Finally, we discuss implications for theory and practice on employee-driven change-orientated safety communication.

Employee Safety Voice

In his seminal work *Exit, Voice, and Loyalty*, Hirschman (1970) defined *voice* as any effort to “change, rather than escape from, an objectionable state of affairs” (p. 30). Later, LePine and Van Dyne (2001) more precisely defined *employee voice* as “constructive change-oriented communication intended to improve the situation” (p. 326). An extensive body of research on voice in organizations has accumulated in recent years (Dundon, Wilkinson, Marchington & Ackers, 2004; Morrison & Milliken, 2003); however, despite calls for facet-specific operationalizations of the construct (Van Dyne, Ang, & Botero, 2003; Withey & Cooper, 1989), most of this research continues to focus on generic employee voice. In the domain of occupational safety, we argue that potential workplace hazards are a salient objectionable state that can prompt workers to voice.

Hirschman (1970) proposed that, unlike other responses to decline (e.g., exit), voice has an “attention-focusing effect” (p. 45) on the target because it offers both specific feedback on failings and suggestions for improvement. Consistent with this idea, voice in the context of safety would ideally motivate action to make work-related situations, procedures, and processes safer. Employee safety voice can include actions such as raising safety concerns with a manager or union steward (e.g., Baugher & Roberts, 2004; Mullen, 2005), speaking before a safety committee (e.g., Eaton & Nocerino, 2000), reporting dangerous working conditions to government officials

(e.g., Gray, 2002), or offering to teach coworkers safer work techniques (e.g., Andriessen, 1978). Taken together, these examples illustrate that employee safety voice (a) is communication motivated toward changing perceived unsafe working conditions that have implications for individual and organizational health (Fuller, Marler, & Hester, 2006), (b) can flow through formal and informal channels, and (c) can be directed toward numerous targets (e.g., supervisors/managers, coworkers, union officials, government officials).

Although employee safety voice shares similarities with general employee voice (e.g., LePine & Van Dyne, 2001), proactive problem-solving (e.g., Parker, Williams, & Turner, 2006), as well as safety-specific concepts such as safety participation (e.g., Neal, Griffin, & Hart, 2000), its normative and behavioral characteristics differ in two ways from these related concepts. First, many actions associated with employee safety voice are afforded legal protection (Robinson, 1991). For example, both union and nonunion workers in many North American and European countries have the legal right to refuse work that poses an imminent danger to life (Harcourt & Harcourt, 2000), to report hazardous working conditions to a government agency, and, depending on the size of the employer, to pursue improvements in safety through legally mandated health and safety committees (Eaton & Nocerino, 2000). In contrast, forms of general employee voice and other extra role behaviors are neither prescribed nor protected under employment laws. Second, proactive problem-solving and other initiative-taking behaviors are usually defined in terms of improving managerially sanctioned goals (e.g., improving performance, furthering organizational priorities). In contrast, employee safety voice may be viewed as dissent when it is perceived to be highly critical of management actions (Detert & Burris, 2007), particularly because workplace safety is ostensibly a managerial priority. Here we concur

with Budd's (2004) assertion that voice "emphasizes an element of self-determination in the employment relationship—even if it doesn't enhance [organizational] efficiency" (p. 23).

Predicting Employee Safety Voice

Despite difficulties predicting general employee voice (Van Dyne et al., 2003; Van Dyne & LePine, 1998; Withey & Cooper, 1989), several individual and contextual correlates of the construct have been identified. These factors have variously included procedural justice (e.g., Bies & Shapiro, 1988), personality traits (e.g., LePine & Van Dyne, 2001), and leadership behavior (e.g., Detert & Burris, 2007). A small subset of voice research has examined workplace hazards (Cree & Kelloway, 1997) and injuries (Barling, Kelloway, & Iverson, 2003) as correlates of voice activity (e.g., perceptions of union instrumentality).

Absent from the wider voice literature are investigations of the roles that both management and coworkers have in influencing general employee voice (Bemmel, 1997), and employee safety voice specifically. Embedded in Hirschman's (1970) original theorizing about voice was a proposition that "the propensity to resort to the voice option . . . [depends on] . . . the general readiness of a population to complain" (p. 43). Building on the idea that the social setting can influence the prevalence of voice, O'Donnell (1986) and Hirschman (1992) suggested that horizontal (i.e., peer-to-peer) voice may play a key role in mobilizing upward voice. This is consistent with work that suggests that group behavior and norms determine whether voicing is more or less likely (Bowen & Blackmon, 2003; Greenberger, Miceli, & Cohen, 1987). In the following sections, we elaborate on how employee perceptions of organizational support and coworker support for safety might influence employee safety voice.

The Influence of Managers and Supervisors on Employee Safety Voice

Organizational support theory (Eisenberger, Huntington, Hutchison, & Sowa, 1986) proposes that employees develop global beliefs about the degree to which their organization supports their needs and values their contributions based on the quality of interactions with organizational agents, such as managers and supervisors (Rhoades & Eisenberger, 2002). These beliefs can be either general or specific,

and here we focus on perceived organizational support for safety (POSS).

Social exchange theory (Blau, 1964) has been used to explain how management behavior informs employee perceptions of organizational support and, in turn, effects employee behavior (Rhoades & Eisenberger, 2002). According to social exchange theory, voluntary behavior is motivated by the norm of reciprocity (Gouldner, 1960). That is, social goodwill is gained (or lost) by individuals to the extent that behavior is perceived to meet (or fails to meet) informal exchange obligations. When behavior is perceived as meeting social obligations, the exchange process is generative and the cycle continues. In terms of safety, when supervisors and managers convey concern for employee safety by valuing suggestions for improving safety, workers develop beliefs that their organization has a positive orientation toward safety, which in turn increases the probability that workers will instigate or participate in safety-related exchanges (Hofmann & Morgeson, 1999; Michael, Evans, Jansen, & Haight, 2005) and participation in other safety-related activities (Griffin & Neal, 2000; Neal et al., 2000). Conversely, when safety-related exchanges do not occur or are inconsistent, employees may be less willing to share ideas or be proactive about safety. From this perspective, employee safety voice is an important currency in safety-related social exchange.

Existing research supports our assertion that POSS will be positively related to employee safety voice. Studies have shown that management openness is positively related to general employee voice (e.g., Detert & Burris, 2007; Saunders, Sheppard, Knight, & Roth, 1992). In terms of safety, Clarke (1998) found that employees' intentions not to report safety incidents were related to their perception that management would take no notice, and Mullen (2005) found that employees were more likely to invest time and effort into raising a safety issue when they thought managers were open to suggestions.

We propose that management openness to safety suggestions alone is only a moderate signal of organizational support for safety; managers and supervisors must also demonstrate their support for safety by acting on problems that are brought to their attention (Harlos, 2001). Although employees may be reluctant to speak up about safety concerns because it challenges managerial authority, managers' actions may help employees more accurately assess the risk of voicing concerns about safety. This feeling of support may generate a sense of approval and the

possibility of positive personal consequences (Nembhard & Edmondson, 2006).

Research on leaders' influence tactics (e.g., Yukl & Tracey, 1992) suggests that downward-directed inspirational appeals (e.g., arousing enthusiasm about tasks) and consultation (e.g., sincere demonstrations of openness to participation and suggestions) can generate strong commitment to work-related tasks. In the domain of safety, these same influence tactics were positively associated with employee safety participation (Clarke & Ward, 2006). Similarly, research on leadership and safety has found that leaders who "walk the talk" foster higher levels of safety communication (e.g., Hofmann & Morgeson, 1999). In sum, when management invites suggestions for improving safety and appears to take action on ideas, employees are more likely to use safety voice.

Hypothesis 1: POSS will be positively related to employee safety voice.

The Influence of Coworkers on Employee Safety Voice

Although the influence of managers and supervisors on employee voice behavior has been documented, less is known about horizontal sources of support for employee safety voice. We argue that coworkers are another important yet often overlooked social influence on safety-related communication. In support of this view, recent research has shown that coworkers are important conduits of safety information and new safety rules (e.g., Laurence, 2005), and that they have an important influence on worker risk-taking behavior (Westaby & Lowe, 2005).

An understanding of how coworkers mutually support safety voice may also be gained through social exchange theory. Specifically, when safety-related exchanges among coworkers involve information about hazards and concern for the safety of others, the norm of reciprocity suggests that the probability of future safety-related exchanges and employee safety voice increases. Conversely, when safety-related exchanges are minimal or inconsistent, coworkers may be less willing to intervene in the face of potential hazards. The effects on employee safety voice of felt obligations to coworkers may be quite general, encouraging horizontal voice through a desire to influence safety directly, and upward voice to influence safety indirectly through appropriate management activities.

Some empirical evidence supports this perspective. For example, Andriessen (1978) found that the anticipated responses of work colleagues were positively correlated with safety-related initiatives. More generally, Zhou and George (2001) found that the amount of perceived support from coworkers was significantly related to making suggestions to improve internal policies and practices. Consistent with this evidence of the generative nature of social exchange, we predict that the more coworkers support safety, then the more likely that employees will speak out about safety concerns.

Hypothesis 2: Perceived coworker support for safety (PCSS) will be positively related to employee safety voice.

A Mediated Model

Thus far, we have argued that when managers and supervisors behave in a way that signifies a sincere concern for the safety of the workforce, employees are more likely to feel supported in raising concerns about safety. Perceiving that coworkers support concerns about workplace safety, we argue, also encourages employee safety voice. Taking these arguments together, we propose that the relationship between POSS and employee safety voice is mediated by PCSS.

Latané (1981) argued that *social impact*—which he broadly defined as the changes in the behavior of a target that occur "as a result of the real, implied, or imagined presence or actions of other individuals" (p. 343)—is a function of *strength* (i.e., power or importance), *intimacy* (i.e., proximity), and *number* of people. More specifically, the greater the importance, greater the proximity, and greater the number of people present, the more likely individual behavior is influenced by a social setting. Research has generally supported these basic tenets of social impact theory (Kiesler & Cummings, 2002).

Although managers and supervisors have more formal power (i.e., strength) in hierarchical organizations (French & Raven, 1959) and are charged with legal and moral responsibility for safety, experienced work colleagues may be perceived as sources of referent and expert power (i.e., strength); further, the organization of work commonly places front-line employees in closer proximity to one another (i.e., intimacy) and in relatively larger numbers than managers. Therefore, in such settings, peer-to-peer safety communication may be more salient than management safety communication, especially when management and supervisors are unavailable to guide and

monitor employees (Westaby & Lowe, 2005). In addition, issues such as safety are more likely to be raised and discussed among front-line employees because of their close proximity to actual safety problems (Carroll, 1998). Based on this reasoning, we argue that coworkers are likely to influence employee safety voice directly.

In the safety domain, research on safety climate (e.g., Zohar, 2002) would suggest that management can have an indirect effect on employee safety voice via group processes. Although often physically removed from the day-to-day safety experiences of frontline workers, managers are more likely to influence group safety norms that can relate to coworker safety support through inspirational appeals and demonstrations of action on safety issues to groups of workers (Clarke & Ward, 2006). Safety-related leadership behaviors have been shown to shape perceived group safety norms, which in turn influence safety outcomes (Hofmann, Morgeson, & Gerras, 2003). Based on this reasoning, we argue that managers and coworkers are likely to influence employee safety voice with coworkers having the most direct influence. Given that contextual factors (e.g., levels of hierarchy, number of front-line employees) that are beyond the focus of this study influence the degree of impact that management may have on voice, we treat the issue of whether management's influence is fully or partially mediated by PCSS as an empirical question.

Hypothesis 3: PCSS mediates the relationship between POSS and employee safety voice.

Method

Study Context

We collected data for the current study in a large unionized urban transport company in a mid-sized city in northern England. The company itself had nine garages across the region. Drivers drove public transport buses on a shift system through a series of multiple-stop routes. Urban bus driving exposes operators to high levels of stress "caused by demands for punctuality; expectations of professional, courteous service; and above all, safe and responsible bus operation" (Evans & Johansson, 1998, p. 101).

Although urban bus drivers experience higher levels of stress and social isolation compared to other jobs (Tse, Flin, & Mearns, 2006), they also have opportunities for meaningful interaction with co-

workers. Peer-to-peer communication may occur at bus garages, during scheduled breaks and shift changes at passenger bus exchanges, and during staff, union, or safety meetings.

Procedure and Participants

Study data were collected through paper-and-pencil questionnaires completed by drivers based in the two largest garages. The questionnaire was piloted and finalized with an advisory group of bus drivers to ensure that the survey items were comprehensible and appropriate to the context (i.e., ecologically valid), and was distributed to drivers with the help of union steward. Participants were assured of confidentiality, permitted to complete the questionnaire on work time, and deposited their completed survey in a locked box on-site that only the researchers could access.

Sample Characteristics

In total, 800 questionnaires were distributed, with 213 drivers completing them (27% response rate). Many of the drivers were on summer leave when the survey was distributed, which may explain the moderate response rate. Of the participants, all but two were male and had a median age category of 40 to 44 years, consistent with the demographic profile of the bus drivers in the study company. The sample was split almost equally (48.2% and 51.8%) between the two study garages with drivers based in the first garage, on average, younger than in the second garage, Mann-Whitney $U = 3458.00, p < .05$.

Measures

Employee safety voice. Drivers responded to five survey items that were developed to measure the degree to which they spoke up about safety concerns to their coworkers, management, and their union. The items for this measure appear in Table 1. Drivers responded using a 5-point response scale that ranged from 1 (*strongly disagree*) to 5 (*strongly agree*), and the scale showed strong internal consistency (coefficient $\alpha = .78$).

Perceived organizational support for safety. Three items were used to measure the degree to which the company encouraged workers to express concerns about safety and responded to workers safety concerns. The wording of the measurement items, which appear in Table 1, is consistent with

Table 1
Standardized Parameter Estimates for the Three-Factor Oblique Model

Item	ESV	PCSS	POSS	R ²
1. I make suggestions about how safety can be improved.	.75			.56
2. I tell my colleague who is doing something unsafe to stop.	.70			.45
3. I discuss new ways to improve safe driving with my colleagues or boss.	.67			.49
4. I inform the union/boss when I notice a potential driving hazard.	.55			.35
5. I report to my boss if my colleagues break any safety rules.	.59			.31
6. My coworkers are ready to talk to fellow employees who fail to use safety equipment/procedures.		.94		.88
7. My coworkers are prepared to stop others from working dangerously.		.89		.79
8. My colleagues encourage each other to work safely.		.78		.61
9. The company takes the safety ideas of employees seriously.			.87	.76
10. The company is quick to respond to the safety concerns of their employees.			.85	.72
11. The company encourages employees to voice their concerns about safety.			.49	.24

Note. ESV = employee safety voice; PCSS = perceived coworker support for safety; POSS = perceived organizational support for safety.

the language of effective influence tactics (Yukl & Tracey, 1992) and measures of perceived organizational support (e.g., Eisenberger et al., 1986). Drivers responded using a 5-point scale that ranged from 1 (*strongly disagree*) to 5 (*strongly agree*), with scale reliability again strong (coefficient $\alpha = .78$).

Perceived coworker safety support. Three items were used to measure perceived coworker support for safety behavior; item wording appears in Table 1. Drivers responded using a 5-point scale that ranged from 1 (*strongly disagree*) to 5 (*strongly agree*). The internal consistency reliability was high (coefficient $\alpha = .90$).

Control variables. We controlled for personality and age to minimize rival explanations. LePine and Van Dyne's (2001) study of the Big Five personality characteristics and voice found that, with the exception of openness, each characteristic was significantly correlated with actual voice behavior. We used Benet-Martínez and John's (1998) 44-item scale that measures the Big Five personality characteristics: agreeableness, conscientiousness, extraversion, openness, and neuroticism. Internal consistency reliabilities for these personality subscales were at least adequate, ranging from .69 (Agreeableness) to .83 (Neuroticism). Previous research has found no consistent relationship between age and general voice, however Mullen (2005) found that age was positively related to being willing to raise a safety issue at work. We measured age as a single item with a range of 10 equally spaced response categories of 5-years (e.g., "40 to 44 years").

Results

Evidence of Discriminant Validity

To establish the discriminant validity of the measures developed for this study (i.e., POSS, PCSS, and employee safety voice), we conducted a series of confirmatory factor analyses. The hypothesized three-factor oblique model proved superior to an alternative three-factor orthogonal model, indicated by the significant model fit improvement, $\Delta\chi^2(3) = 82.98, p < .01$ ($n = 213$), and its stronger fit indexes (CFI = .99 and RMSEA = .03 for the oblique model compared to CFI = .91 and RMSEA = .10 for the orthogonal model). Two other potential models, specifically two oblique factors (i.e., POSS and PCSS were collapsed into one factor, and Employee Safety Voice as the other factor) and a one-factor model, both provided substantially poorer fit to the data. In the three-factor oblique model, all factor loadings were significantly greater than zero ($p < .01$), the factors explained a substantial proportion of item variance (mean $R^2 = .56$), and the three factors were modestly correlated ($.18 < r < .44$). Parameter estimates and R^2 statistics for each item are given in Table 1, with the fit statistics of the competing models detailed in Table 2.

Table 3 presents the descriptive statistics and zero-order correlations of the study variables. In terms of background variables, age, extraversion, agreeableness, conscientiousness, and openness exhibited weak to moderate relationships ($.16 < r < .21, ps < .05$) with employee safety voice, and were included in the regression analyses. PCSS was strongly

Table 2
Confirmatory Factor Analysis Results for the Study Variables

Model	χ^2	<i>df</i>	GFI	AGFI	RMSEA	NFI	CFI	PNFI	PGFI
3-factor oblique	49.30	41	.96	.93	.03	.95	.99	.71	.60
3-factor orthogonal	132.28	44	.90	.85	.10	.87	.91	.70	.60
2-factor oblique ^a	218.75	43	.84	.76	.14	.79	.82	.62	.55
1-factor	454.80	44	.72	.58	.21	.62	.65	.50	.48

Note. GFI = goodness-of-fit index, AGFI = adjusted goodness-of-fit index, RMSEA = root mean squared error of approximation, NFI = normed fit index, CFI = comparative fit index, PNFI = parsimonious normed fit index, PGFI = parsimonious goodness-of-fit index.

^a We collapsed Perceived Organizational Support for Safety and Perceived Coworker Support for Safety into one factor; Employee Safety Voice was the other factor.

positively related to both POSS and employee safety voice ($.37 < r < .44$, $ps < .001$), and POSS was moderately correlated with employee safety voice ($r = .18$, $p < .01$).

Table 4 presents the regression models that examined the direct relationships (Hypotheses 1 and 2), and tested for evidence of mediation (Hypothesis 3; Baron & Kenny, 1986). Controlling for age, $\Delta R^2 = .05$, $\Delta F(1, 200) = 9.80$, $p < .01$, in Step 1 and the personality characteristics, $\Delta R^2 = .08$, $\Delta F(4, 196) = 4.66$, $p < .01$, in Step 2, Step 3 of Model 1 indicated that POSS was positively related to employee safety voice ($\beta = .14$, $p < .05$), supporting Hypothesis 1 and passing the first test in the mediation procedure. Controlling for age, $\Delta R^2 = .01$, $\Delta F(1, 200) = 2.12$, $p > .05$, in Step 1 and the personality characteristics, $\Delta R^2 = .04$, $\Delta F(4, 196) = 1.85$, $p > .05$, in Step 2, Step 3 of Model 2 indicated that POSS was positively related to PCSS ($\beta = .33$, $p < .001$), supporting Hypothesis 2 and fulfilling this requirement for mediation. The results of Model 3 show PCSS mediating the relationship between POSS and employee safety voice ($\beta = .39$, $p < .001$). This provides full support for mediation hypothesis (Hypothesis 3).¹

Finally, we conducted a Sobel test (Sobel, 1982). The results supported a significant mediated relationship between POSS and employee safety voice ($z = 3.73$, $p < .001$), after controlling for PCSS and the relevant individual differences.

Discussion

The purpose of this study was to examine how employee perceptions of organizational and coworker support for safety influence employee safety voice. Controlling for age and personality traits, bus drivers reported that they spoke out more about

safety issues when they perceived that their organization supported safety (i.e., encouraged, listened to, and took action on safety suggestions). Furthermore, this association was fully mediated by the extent to which coworkers supported workplace safety. These results are also consistent with recent studies of the concurrent influence of management and coworkers on employee behavior (Parker et al., 2006; Westaby & Lowe, 2005), and support Parker et al.'s assertion that focusing on managers' behaviors alone is insufficient for developing a more proactive workforce.

The magnitude of the effect of PCSS on employee safety voice was significantly larger than the influence of POSS when both PCSS and POSS were entered in the same model. In organizations where work is geographically dispersed, as in the case of the current sample, managers and supervisors may have limited direct contact with frontline employees' day-to-day safety experiences. This finding is interesting, as it suggests a sizable effect of PCSS that originates from sources other than POSS. One such factor may be the presence of a union. For example, working along side fellow union members may increase the sense of concern and shared responsibility for safety and thus lead to more voicing. Another such factor may be the extent to which front-line employees feel they are working in a dangerous situation. Given that front line employees are most likely to be affected by danger, they are more likely to voice if they feel threatened, or if they feel coworkers are putting them in danger. A final factor that may contribute to PCSS is the extent to which em-

¹ We conducted the tests for the hypotheses without age and personality traits, and the pattern of results remained the same.

Table 3
Means, Standard Deviations, and Zero-Order Correlations (N = 201–213)

	M	SD	1	2	3	4	5	6	7	8	9
1. Age	6.19	2.10	—								
2. Extraversion	3.36	.55	-.22	—							
3. Agreeableness	3.80	.43	-.03	.20	—						
4. Conscientiousness	3.83	.44	-.03	.34	.51	—					
5. Neuroticism	2.52	.65	.06	-.33	-.50	-.43	—				
6. Openness	3.32	.45	-.08	.35	.18	.30	-.05	—			
7. POSS	2.72	.90	-.02	.07	.24	.17	-.12	-.03	—		
8. PCSS	2.94	.90	.09	.05	.19	.14	-.08	.04	.37	—	
9. Employee Safety Voice	2.45	.79	.21	.16	.18	.16	-.07	.21	.18	.44	—

Note. POSS = Perceived Organizational Support for Safety. PCSS = Perceived Coworker Support for Safety. Correlations higher than .15 are $p < .05$; correlations higher than .18 are $p < .01$.

ployees work closely and interdependently, and therefore affect the safety of each other. Employees who work closely and who depend on each other to create a safer work environment are more likely to hold each other accountable for safe work.

Although coworkers may be perceived as more accessible and credible sources of safety support in these environments, we argue that managers maintain an important role in supporting both upward and

lateral change-oriented safety communication. Coworkers' willingness to speak out on safety issues may be taken as a reflection of management's more distal support of safety. Taken together, the foregoing may explain why we found a fully mediated effect for POSS on employee safety voice. Future research should examine how the spatial organization of work, unionization, and other structural factors affect patterns of social influence on employee safety voice.

Table 4
Hierarchical Regression Analyses Constituting the Four Tests in Baron and Kenny's (1986) Recommendations for Determining Whether Perceived Coworker Support for Safety Mediates the Relationship Between Perceived Organizational Support for Safety and Employee Safety Voice

Model	Dependent variable	Test	Step	Predictor variables	β	R^2	ΔR^2
1	Employee Safety Voice	1	1	Age	.26***	.05	
			2	Extraversion	.13	.13	.08**
				Agreeableness	.10		
				Conscientiousness	-.01		
				Openness	.17*		
2	PCSS	2	3	POSS	.14**	.15	.02*
			1	Age	.13	.01	
			2	Extraversion	.02	.05	.04
				Agreeableness	.09		
				Conscientiousness	.04		
3	Employee Safety Voice	3 + 4	3	Openness	.03		
				POSS	.33***	.15	.10***
			1	Age	.21**	.04	
			2	Extraversion	.12	.12	.08**
				Agreeableness	.06		
	Conscientiousness	-.02					
	Openness	.16*					
	PCSS	.39***	.26	.14***			
	POSS	.07	.26	.00			

Note. N = 201. All parameter estimates listed originate from the final step in the model. POSS = Perceived Organizational Support for Safety. PCSS = Perceived Coworker Support for Safety.
* $p < .05$, ** $p < .01$, *** $p < .001$.

Another interesting result is that younger bus drivers reported less employee safety voice even when controlling for personality and social influences. It may be that younger workers seek to build an impression that they are hardworking and able to carry out work assignments, and this may lead them to speak out less about safety issues (Loughlin & Frone, 2004). In support of this explanation, Breslin, Polzer, MacEachen, Morrongiello, and Shannon (2007) found that in certain occupations (e.g., construction), young male workers said they rarely voiced safety complaints to supervisors. Another explanation is that accumulated safety knowledge and safety experience may inform older workers' levels of employee safety voice.

In addition, the current results contradict earlier correlation evidence of significant relationships between most of the Big Five personality characteristics and employee voice (e.g., LePine & Van Dyne, 2001). In our multivariate model, the Big Five characteristics collectively had a small effect ($R^2 = .08$), which suggests that contextual factors may be stronger predictors of employee voice than personality.

Strengths and Limitations

The current study has several strengths. To our knowledge, this is the first study to investigate the relative roles of management and coworkers in influencing safety-specific voice. Second, the hypothesized mediated effect was supported when controlling for theoretically relevant variables (e.g., personality, age) associated with employee voice. Related to this, past studies have noted difficulties predicting voice, and in particular the low level of variance explained by individual and situational correlates of voice (e.g., Van Dyne et al., 2003). Our final (mediated) model explained a moderate level of variance ($R^2 = .26$), which represents an improvement over previous studies of general employee voice. Our use of an ecologically valid measure of employee safety voice, which included both management and coworker targets, may partially account for this result.

Despite these strengths, the current results should be interpreted cautiously. First, self-reported employee safety voice may have accurately captured intentions to speak out and not actual voice behavior. In addition, using all self-report data could artificially inflate the relationships among the study variables. We do not think mono-source bias was a plausible threat in this study for four reasons: (a) third-party

reports (coworker and supervisor) of voice have been shown to be moderately consistent with self-reported measure of employee voice (Van Dyne & LePine, 1998), (b) the distribution of self-reported safety voice was slightly positively skewed and close to the midpoint of the response range ($M = 2.45$), suggesting that bus drivers may not have inflated self-reports of safety voice behavior, (c) the correlations among study variables are not all significant (Lindell & Whitney, 2001), and (d) the confirmatory factor analysis showed that the one-factor measurement model was a poor fit to the data (Podsakoff & Organ, 1986).

Second, we predicted and found that POSS would influence employee safety voice via PCSS, however our cross-sectional design precludes causal inference. It is possible, for example, that workers who speak out about safety issues assume that their coworkers are supportive of safety-related change when in fact they may not be. Third, although our response rate (27%) was modest, it is still within the range for published studies that use samples of bus drivers (Tse, Flin, & Mearns, 2007). Fourth, the generalizability of our model may be limited by the characteristics of the current sample. In jobs that allow for continuous direct supervision, managers may have more influence on employee safety voice than coworkers, and thus in these environments a partially mediated model may provide a better fit than the fully mediated one. Conversely, in samples in which workers are more interdependent, coworkers may have an even stronger influence on employee safety voice. Fifth and finally, the current sample was nearly all male and this may limit the generalizability of the model to mixed-gender samples.

Implications for Future Research

Our study focused on managers and coworkers in a unionized company as sources of social influence in predicting employee safety voice. It would be interesting to compare the effectiveness of informal safety voice such as the kind studied here (e.g., attempting to change a coworker's unsafe work habits) to formal safety voice mechanisms (e.g., union-management grievance process) in terms of addressing work safety concerns. In a large sample in the United Kingdom, Bryson (2004) found that informal voice was more effective in gaining managerial responsiveness for general workplace concerns than having access to a grievance process.

In the current study, we evaluated one horizontal source (i.e., coworkers) and one vertical source (i.e., management) of support for employee safety voice.

Future research should examine other conceptually relevant social influences (e.g., spouses, union steward, customers, parents). For example, social impact theory would suggest that customers may influence employee safety voice in jobs which involve frequent face-to-face interaction with members of the public. Related to this, future studies might examine whether there are differential predictors for employee safety voice aimed at managers and coworkers. In the current study, the targets of worker safety voice were combined into an overall measure of employee safety voice.

Further, we argued that the direct influence of coworkers may be related to the organization of work. However, under conditions of tight supervision (i.e., close proximity), low task interdependence, and/or low span of control (i.e., low ratio of employees to supervisors), management may have a direct influence on employee safety voice. In their study of workplace aggression, Robinson and O'Leary-Kelly (1998) found that, although lower task interdependence buffered the effects of group antisocial behavior on individual antisocial behavior, close supervision had no effect. It is important that future research on employee safety voice and voice more generally specifies models that take into account how work design and other contextual factors affect patterns of social influence.

Finally, in terms of public policy, our results add to calls for an emphasis on safety support at all organizational levels (Vredenburg, 2002). More specifically, training related to effective safety communication (e.g., sharing critical opinions about safety) would be valuable not only for younger workers but also coworkers and supervisors. Young workers may lack the confidence to speak up about safety issues due to impression management concerns. Work peers and supervisors should be made aware of this and be offered practical instruction on ways of alleviating barriers to employee safety voice.

Conclusion

Speaking out about dangerous work is important for attempting to change hazardous work conditions. The current findings revealed that perceived organizational openness for safety is correlated with employee safety voice, and that this association occurs via perceptions of coworker support for safety. Although continued research attention on managerial action is needed given the legal responsibility employers have for workplace safety, researchers should strive for a more holistic understanding of the web of

social influences related to workplace safety communication and change, and turn greater attention to the important role that coworkers play in encouraging others to speak out about workplace safety issues.

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Received September 8, 2006

Revision received January 26, 2008

Accepted February 4, 2008 ■