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Safety-Related Behavior as a Social Exchange: The Role of Perceived Organizational Support and Leader–Member Exchange

David A. Hofmann and Frederick P. Morgeson
Texas A&M University

Researchers have been giving increased attention to the role larger organizational variables play in safety and accidents. Although generally neglected by this research, the nature of the exchange relationships between individuals, leaders, and the organization appears to have safety-related implications. The present research linked leader–member exchange (LMX) and perceived organizational support (POS) to safety communication, safety commitment, and accidents. Data were collected from 49 supervisor–group-leader dyads in a manufacturing facility. The results indicated that POS was significantly related to safety communication and that LMX was significantly related to safety communication, safety commitment, and accidents. Support was also found for a structural model linking POS and LMX to safety communication, safety commitment, and accidents. Implications of these findings for safety and social exchange research are outlined.

In 1996, workplace accidents caused 4,800 deaths and 3,900,000 disabling injuries, with a combined cost to organizations of $121 billion (National Safety Council, 1997). Although safety has historically been viewed as an engineering problem, researchers are increasingly acknowledging that organizational factors play an important role in workplace safety (see Hofmann, Jacobs, & Landy, 1995; Hurst, Bellamy, Geyer, & Astley, 1991; Kletz, 1985). This has led to research investigating such factors as safety climate (Dedobbeleer & BeLand, 1991; Donald & Canter, 1994; Neal & Griffin, 1997; Niskanen, 1994; Zohar, 1980), group processes (Embrey, 1992; Hofmann & Stetzer, 1996), communication (Dawson, 1991; Hofmann & Stetzer, 1998; Wright, 1986), organizational structure (Perrow, 1984), decision making (Wagenaar & Groeneweg, 1987), organizational politics (Gephart, 1984; Turner & Pidgeon, 1997), leadership (Simard & Marchand, 1994, 1997), and the degree to which management values employees (e.g., Erickson, 1997; Millar, 1993; Sarkus, 1996).

One area that has received little attention, however, is the influence that organizationally based social exchanges may have on safety. Social exchange theory (Blau, 1964) suggests that as one party acts in ways that benefit another party, an implicit obligation for future reciprocity is created (Gouldner, 1960). Over time, this implicit obligation results in certain behaviors designed to benefit the initiating party. In looking over the constructs investigated in the safety arena, one can envision how social exchange might help to explain some of the observed relationships. For example, if one considers the foundational arguments for safety climate, the social exchange perspective seems relevant. For example, Zohar (1980, p. 10) noted that management's commitment to safety "is a major factor affecting the success of safety programs in industry," and that this commitment can manifest itself through such things as job training programs, participation of management in safety committees, and taking safety into consideration in job design. Zohar argued that these management actions influence employee perceptions regarding the safety climate of the organization. Interestingly, these safety-related actions could be viewed from a social exchange perspective as well, in that they signal an implied obligation for workers to act in a safe manner. In fact, Hofmann and Stetzer (1996) found that positive safety climates were related to safety-related behavior.

This conceptualization of social exchanges arising between and among organizational members has been used as the foundation for a number of different areas of investigation within the organizational sciences. For example, Konovsky and Pugh (1994) and Moorman (1991) suggested that implied obligations arising through social exchanges

David A. Hofmann and Frederick P. Morgeson, Department of Management, Lowry Mays College and Graduate School of Business, Texas A&M University.

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Correspondence concerning this article should be addressed to David A. Hofmann, Department of Management, Lowry Mays College and Graduate School of Business, Texas A&M University, College Station, Texas 77843-4221. Electronic mail may be sent to dhofmann@tamu.edu.

could be reciprocated through employee citizenship behaviors. More recently, Tsui, Pearce, Porter, and Tripoli (1997) suggested that investment-oriented human resource practices would result in an unspecified perception of obligation by the employees. They argued that this perceived obligation would manifest itself in increased citizenship behaviors, increased performance of core tasks, and lower absenteeism. Similarly, social exchange has been used to describe the relationships that develop between individuals and their leader (e.g., Liden, Wayne, & Stilwell, 1993; Settoon, Bennett, & Liden, 1996) as well as with the larger organization (e.g., Eisenberger, Fasolo, & Davis-LaMastro, 1990; Eisenberger, Huntington, Hutchison, & Sowa, 1986; Settoon et al., 1996).

Although social exchange theory has increasingly been used as a conceptual foundation within the organizational sciences, researchers have not yet linked it to safety-related outcomes. To address this deficit, we investigated the relationships between two forms of social exchange—perceived organizational support (POS) and leader–member exchange (LMX)—and the degree to which employees feel free and are willing to raise safety concerns, their commitment to following accepted safety procedures and practices, and the occurrence of accidents. In the following section, we propose relationships between POS and LMX, safety communication, and safety commitment. We then discuss the relationship between these two safety-related constructs and accidents occurring within organizations. Finally, after proposing a number of bivariate relationships, we propose a more fully integrated structural model relating POS and LMX to the raising of safety concerns, safety commitment, and accidents.

POS, LMX, Safety Communication, and Safety Commitment

POS and Safety Communication

Eisenberger and colleagues (Eisenberger et al., 1986, 1990) proposed that when employees perceive their organization values and is committed to them (i.e., high POS), an implied obligation develops for future reciprocity aimed at benefiting the organization. These beneficial actions have been shown to include engaging in organizational citizenship behaviors, making suggestions to improve the organization, and performing better (Eisenberger et al., 1990; Wayne, Shore, & Liden, 1997). The mechanisms that underlie these effects appear to have implications for safety communication for several reasons. First, because POS is related to an increased willingness to make suggestions to improve the organization, it seems likely that it also would be associated with safety-related communication because the raising of these concerns is ultimately beneficial to the organization.

Second, Tsui et al. (1997) found that human resource policies that signaled an investment in employees—policies that should also foster higher POS—were more likely to engender employee citizenship behaviors. If one reviews the citizenship measure used by Tsui et al., a number of the items involve communicating concerns and problems observed within the organization (e.g., "calls management attention to dysfunctional activities," "informs management of potentially unproductive policies and practices," and "suggests revisions in work to achieve organizational or departmental objectives"). From this, it seems likely that one potential reciprocating action resulting from high POS would be the raising of safety concerns, because these concerns reflect a more specific manifestation of the raising of general problems and concerns assessed by Tsui et al.

Finally, if the organization actively attempts to demonstrate that it values and cares for its workers, then employees should perceive that management would be open to the raising of safety concerns. In other words, the raising of these concerns would be consistent with the organization valuing its employees, because the raising of these concerns is designed to improve the physical well-being of the workforce. Taking these reasons in combination, we hypothesized that individuals who have high perceptions of organizational support would be more likely to raise safety concerns.

> *Hypothesis 1:* Perceptions of organizational support will be positively related to safety communication.

LMX and Safety Communication

As previously highlighted, social exchange also has been used as the conceptual foundation for a large body of LMX research. One aspect of this relationship that has received attention is how high-quality LMXs foster more open and constructive communication. For example, Fairhurst (1993; see also Fairhurst & Chandler, 1989; Fairhurst, Rogers, & Sarr, 1987) found that high-quality LMXs involved more open discourse surrounding nonroutine problems, strong value congruence, more joint decision making, and minimal power distance between the leader and subordinate (see also Fairhurst, Rogers, & Sarr, 1987; Schiemann, 1977; cited in Liden, Sparrowe, & Wayne, 1997). If high-quality leader–member relations are associated with generally more open and egalitarian communication, increased value congruence, and more open communication surrounding nonroutine problems (Fairhurst, 1993; Liden et al., 1997), then these same relationships should apply to the more specific situation of raising of safety concerns within the leader–member dyad (see Simard & Marchand, 1997). Thus, we hypothesized that high-quality leader–member exchanges will be typified by an openness to the raising of safety concerns.

Hypothesis 2: Higher quality LMXs will be positively related to safety communication.

POS, LMX, and Safety Commitment

The quality of LMX and POS should also be related to safety commitment for at least two reasons. First, POS and LMX have been shown to be related to the internalization of the organization's values (i.e., organizational commitment; Eisenberger et al., 1990). In contexts where employee actions have direct safety implications, these values will include safe behavior, and their internalization will be related to increased safety commitment. Second, previous social exchange research suggests that employees direct their behaviors to particular targets given the nature of the exchange relationship. In other words, pro-organizational actions result from POS, and pro-leader actions result from LMX (e.g., McNeely & Meglino, 1994; Settoon et al., 1996; Wayne et al., 1997). A strong commitment to safety benefits the organization by increasing safety compliance behavior (i.e., following accepted safety practices), reducing the number of accidents, and reducing the costs associated with accidents (e.g., workers' compensation insurance). Commitment to safety can also benefit the leader by indirectly influencing perceptions of their performance by senior management. Specifically, in many organizations where jobs have direct safety implications, part of the performance evaluation of leaders is based on the safety record of their subordinates. Thus, an employee who is committed to safety can indirectly benefit their leader by helping to establish an outstanding safety record, which will be viewed positively by the leader's immediate supervisor. Given this, we hypothesized that employees who had stronger POSs and higher quality LMXs would be more committed to safety.

Hypothesis 3: POS will be positively related to safety commitment.

Hypothesis 4: LMX will be positively related to safety commitment.

Safety Communication, Safety Commitment, and Accidents

Although the preceding discussion proposed relationships between social exchange and both safety communication and commitment, it leaves unanswered how these different safety variables relate to each other as well as accidents. Looking first at their interrelationship, we hypothesized that safety communication would be positively related to leader ratings of safety commitment. When a work group member frequently raises safety concerns to his or her leader (i.e., engages in safety communication), these actions should signal to the leader that the worker is committed to safety. Thus, from the leaders perspective, those work group members who engage in more safety communication should be perceived as being more strongly committed to safety.

Hypothesis 5: Safety communication will be positively related to safety commitment.

In addition to increasing perceptions of safety commitment, employees who engage in more safety-related communication with their leader should better understand proper safety procedures, policies, and the consequences of unsafe behavior. In addition, when minor incidents occur (i.e., those which do not lead to accidents), the leader–member dyads with better exchange relationships will be more likely to talk about it, allowing the individual to learn from the incident (see Edmondson, 1996). The increased knowledge and learning that results from greater communication is likely to lead to reduced accidents.

Hypothesis 6: Safety communication will be negatively related to accidents.

Clearly, however, communication is not enough. Individuals must also be committed to performing safely. Such commitment will manifest itself through increased adherence to established safety practices and procedures (e.g., the wearing of personal protection equipment, not taking unsafe shortcuts). This commitment (and the behaviors it implies) will, over time, lead to fewer accidents.

Hypothesis 7: Safety commitment will be negatively related to accidents.

Putting It All Together: An Integrated Model of POS, LMX, and Safety

Thus far, a number of bivariate relationships have been hypothesized between and among POS–LMX and safety communication, safety commitment, and accidents. These constructs, however, can be depicted in terms of a more integrated structural model (see Figure 1).

We hypothesized that POS and LMX would be related to leader ratings of safety commitment. These leader perceptions of safety commitment would be based on the safety-related behaviors of work group members. One such behavior that we felt would likely influence leader perceptions of safety commitment was whether the employee brought safety concerns to the attention of the leader. Thus, we hypothesized that the relationship between POS–LMX and leader perceptions of safety commitment would be mediated by safety communication. Put more simply, this mediation suggests that perceptions of organizational support and high-quality exchanges with one's leader would provide the foundation for more open and free flowing communication—particularly about concerns and problems (Fairhurst, 1993; Liden et al., 1997). With this foundation in place, work group members with stronger POSs and higher quality

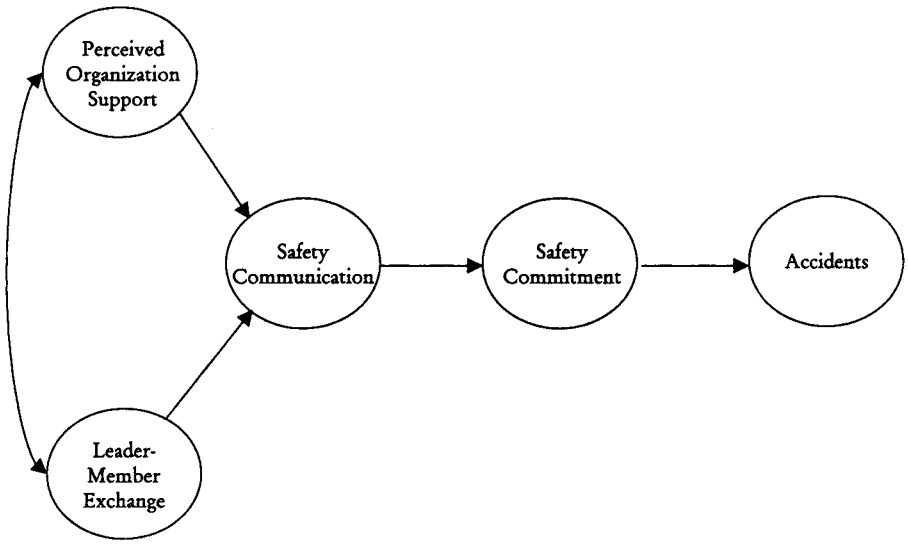

Figure 1. Hypothesized integrated structural model.

LMXs would be more likely to raise safety-related concerns. The raising of these safety concerns would, in turn, signal to the leader that these work group members were highly committed to safety (i.e., be rated as being more committed to safety).

Although the raising of safety concerns is one behavior that will demonstrate to the leader that the worker is committed to safety, there will likely be others (e.g., following accepted policies and procedures). Thus, work group members who are perceived as being more highly committed to safety will likely exhibit a number of behaviors that reflect this safety commitment (e.g., raising of concerns, following accepted safety practices). Because these perceptions of safety commitment would be based upon these behaviors, we expected that work group members who were rated as being more committed to safety should, over time, experience fewer accidents.

Method

Research Setting

The research context for this study was a manufacturing facility that produces commercial heating and air conditioning systems. The organization employs approximately 1,200 unionized production employees organized into 64 work groups. Each work group is led by a "group leader" who is charged with facilitating all aspects of the group's functioning (e.g., ensuring supply of raw materials, facilitating coordination of group members, providing feedback to work group members, and ensuring the attainment of production goals). In addition to these duties, group leaders frequently become involved in the production cycle to facilitate goal attainment. Group leaders are members of the union and are paid an hourly premium for performing these additional functions.

In this organization, it is primarily through the relationship between the nonunion supervisor and the unionized group leader that the values, goals, and objectives of management are communicated to the production employees. In this sense, the group leaders are charged with ensuring that production and quality goals are met, as well as handling any problems that occur within the group. These group leaders, however, are also union members. Thus, this relationship reflected a critical boundary between management-level and production-level employees and, as a consequence, was the focus of the current study.

Participants

The participants were 64 group leaders of a manufacturing plant. They had an average age of 50.8 years (SD = 7.4), an organizational tenure of 26.2 years (SD = 9.5), and a group-leader tenure of 4.0 years (SD = 2.6). A total of 88% of the group leaders were male, 15% reported having some high school education, 67% had high school diplomas, and 18% reported some college-level education. As is discussed later, group leader responses were linked to supervisory ratings of commitment as well as accidents in the year following the survey. Of the 64 group leaders, 49 provided information that allowed linkage to both supervisor responses and accidents.

Measures

POS. We measured POS with nine items from the short version of the Survey of Perceived Organizational Support (Eisenberger et al., 1986). A 5-point Likert-type scale was used, ranging from 1 (*not at all*) to 5 (*to a very large extent*), such that higher scores reflected stronger perceptions of organizational support.

Scale scores were created by computing the mean across the nine items. The items asked the extent to which the organization values employees (e.g., values your contribution, considers your goals and values, provides help when you have a problem, cares about your well-being, and cares about your opinions). Internal consistency reliability was .96.

LMX. We measured LMX with the seven-item LMX measure provided in Graen and Uhl-Bien (1995). A 5-point Likert-type scale ranging from 1 (*not at all*) to 5 (*to a very large extent*) was used such that higher scores reflected higher quality exchanges. Scale scores were created by computing the mean across the seven items. The items asked group leaders the extent to which they had high-quality exchanges with their supervisor (e.g., know where you stand with your supervisor, your supervisor understand(s) your job problems and needs, your supervisor recognizes your potential, and would you defend and justify your supervisor's decision if he/she were not present). Internal consistency reliability was .87.

Safety communication. Safety communication was measured by seven items based on the defensive communication literature (e.g., Gibb, 1961; see also Hofmann & Stetzer, 1998). A 5-point Likert-type scale ranging from 1 (*not at all*) to 5 (*to a very large extent*) was used so that higher numbers reflected more open upward communication about safety. Scale scores were created by computing the mean across the seven items. These items asked group leaders the extent to which they (a) feel comfortable discussing safety issues with their supervisor, (b) feel free to discuss safety related issues with their supervisor, (c) try to avoid talking about safety issues with their supervisor (reversed coded), (d) feel that their supervisor openly accepts ideas for improving safety, (e) are reluctant to discuss safety-related problems with their supervisor (reverse coded), (f) feel their supervisor encourages open communication about safety, and (g) generally try to avoid talking about safety-related issues with their supervisor (reverse coded). Internal consistency reliability was .85.

Safety commitment. Group leader supervisors (n = 21) provided a rating of safety commitment using items that were developed for the current study. The rating consisted of three items asking the extent to which the group leader (a) takes responsibility for the organization's safety record, (b) is concerned with the safety of their work group's performance, and (c) tries to get their work group to meet or exceed safety standards. A 5-point scale was used, with the scale score computed by taking the mean across the three items. The measure was coded so that higher scores reflected a stronger safety commitment. Internal consistency reliability was .89.

Accidents. The participating organization's archival records were used to gather accident data 1 year after the administration of the survey. In this organization, every time an individual is injured he or she is required to report to the company nurse, who completes a report. This accident database is maintained by the company nurse. Feedback regarding the number of accidents is only provided as the overall number of accidents for the organization. In other words, none of the supervisors receive systematic feedback regarding the accident rates of their group leaders. Our accident measure consisted of the number of accidents experienced by group leaders for the year following the administration of the survey measures discussed above.[1]

Results

Bivariate Results

Table 1 presents the means, standard deviations, and intercorrelations of the variables included in the study. As can be seen, the demographic variables were, on the whole, not significantly related to the variables of interest. Two exceptions are that group leaders who had higher job tenure reported lower POS ($r = -.28$), and group leaders that had worked for the organization for a longer period of time were less likely to have had an accident in the following year ($r = -.29$).

In Hypotheses 1 and 2, we predicted that POS and LMX would be positively related to safety communication. Inspection of Table 1 reveals a significant relationship between safety communication and POS ($r = .54$) and LMX ($r = .47$) offering support for Hypotheses 1 and 2. The direction of these relationships suggest that individuals who had higher POSs and higher quality LMXs were more likely to engage in safety-related communication.

In Hypotheses 3 and 4, we predicted that POS and LMX would be related to leader ratings of safety commitment. Table 1 shows a nonsignificant relationship between safety

[1] Inspection of the distribution of accidents indicated a positively skewed, nonnormal distribution. To assess the degree to which linear models were appropriate, we investigated the relationship between accidents and each of the other variables using a negative binomial regression analysis. The results obtained in these analyses and the same regressions performed in LISREL were virtually identical. Specifically, the results for each of the other variables and accidents were as follows: organizational support (LISREL = $-.17$, $t = -.67$, *ns;* Negative Binomial = $-.19$, $z = -.72$, *ns*), LMX (LISREL = $-.69$, $t = -2.40$, $p < .05$; Negative Binomial = $-.59$, $z = -2.46$, $p < .05$), safety communication (LISREL = $-.73$, $t = -2.13$, $p < .05$; Negative Binomial = $-.65$, $z = -2.22$, $p < .05$), and safety commitment (LISREL = $-.57$, $t = -1.96$, $p < .05$; Negative Binomial = $-.50$, $z = -1.96$, $p < .05$). Given these results, we concluded that the linear models were adequately capturing the relationships between each of the predictors and accidents. In addition to these analysis, we also tested each of the hypotheses and each of the structural models using a square-root transformed accident measure (in keeping with recommendations regarding positively skewed frequency data; see Afifi & Clark, 1984; see also Hofmann & Stetzer, 1996; Watson, Driver, & Watson, 1985). Once again, the results were virtually identical to the findings using the raw accident measure. Given these findings and in order to simplify the presentation of the results, only the raw accident measure is reported.

Table 1
Means, Standard Deviations, and Intercorrelations Among Variables

Variable	1	2	3	4	5	6	7	8	*M*	*SD*
1. POS	(.96)								2.50	0.86
2. LMX	.48**	(.87)							3.00	0.78
3. Safety communication	.54**	.47**	(.85)						3.93	0.67
4. Safety commitment	.11	.29*	.35**	(.89)					3.74	0.78
5. Accidents	−.09	−.32*	−.28*	−.26*	—				0.92	1.46
6. Age	.03	.08	−.08	.01	−.11	—			50.76	7.44
7. Organizational tenure	.04	.21	.02	.13	−.29*	.82**	—		26.23	9.50
8. Job tenure	−.28*	−.11	−.15	.02	.04	.32	.37**	—	3.95	2.60

Note. $n = 49$ for variables 1–5. Sample sizes for age, organizational tenure, and job tenure were 49, 47, and 44, respectively. Where appropriate, internal consistency reliability coefficients are included in parentheses on the diagonal of the correlation matrix. POS = perceived organizational support. LMX = leader–member exchange.
* $p \leq .05$, one-tailed. ** $p < .01$, one-tailed.

commitment and POS ($r = .11$) but a significant relationship with LMX ($r = .29$). Thus, Hypothesis 4 was supported. The direction of the significant relationship suggests that individuals who had higher quality exchanges with their leader were more likely to be committed to safety (as rated by their supervisor).

In Hypotheses 5, 6, and 7, we predicted that safety communication would be positively related to safety commitment and that both safety communication and safety commitment would be negatively related to accidents in the year following the survey. Table 1 reveals that safety communication was positively related to safety commitment ($r = .35$) and that both safety communication and safety commitment were significantly related to accidents ($rs = -.28$ and $-.26$, respectively). Thus, Hypotheses 5, 6, and 7 were all supported. The direction of these relationships suggest that work group members who engaged in more safety-related communication were more likely to be perceived as being committed to safety. In addition, work group members who engaged in more safety-related communication and who were perceived as being more committed to safety were involved in fewer accidents in the following year.

Structural Model

The integrated model was tested with structural equation modeling (LISREL 8). Given the small sample size, we opted to fix the measurement model in order to keep the sample size to estimated parameter ratio to recommended levels (e.g., 10 to 1; Bentler & Chou, 1988). We accomplished this by specifying the factor loadings for the latent variables equal to the square root of the reliability, and the measurement error in the observed variable fixed to (1-reliability) multiplied by the variance of the observed measure, that is, (1 − reliability) × variance. The internal consistency reliability estimates noted above were used to estimate the reliability of the measures. A reliability of .90 was assumed for the accident measure (see Anderson & Gerbing, 1988, p. 415).

Table 2 presents the results for the hypothesized model. In sum, the estimation of the hypothesized model in Figure 2 indicated that all of the structural paths were significant ($p < .05$) and, overall, that the model fit the data well, $\chi^2(5, N = 49) = 7.44$, *ns,* goodness-of-fit index (GFI) = .95, comparative fit index (CFI) = .94, incremental fit index (IFI) = .95, root-mean-square error of approximation (RMSEA) = .10. In keeping with accepted procedures for testing structural models, we developed a series of nested alternative models with which to compare the hypothesized model. The results of these models can also be found in Table 2. These alternative models essentially tested whether model fit was significantly improved by adding each deleted structural path individually, adding several of these paths in combination, or reconfiguring the relationship among safety outcomes (see Table 2 for details). The results indicated that the hypothesized model fit the data significantly better than the null model and that none of the alternative models fit the data significantly better than the hypothesized model. Even though the overall results indicate that several alternative models fit the data slightly better, the incremental improvement over the hypothesized model was not significant given the loss in degrees of freedom.

Additional Analyses

In addition to the tests of the hypotheses and the structural model, two additional analyses were conducted. The first analysis involved assessing the final structural model while controlling for organizational tenure. As discussed earlier, organizational tenure was significantly related to accidents. Thus, the first additional analysis added organi-

Table 2
Comparison of Hypothesized Structural Model With Five Alternative Models

Model	χ^2	*df*	$\chi^{2\text{diff}}$	df_{diff}[a]	GFI	AGFI	CFI	IFI	RSEA
Hypothesized	7.44	5			.95	.84	.94	.95	.10
Model 1	50.58	10	43.14	5	.67	.51	.00	.00	.29
Model 2	6.72	4	0.72	1	.95	.82	.93	.94	.12
Model 3	4.08	4	3.36	1	.97	.88	1.00	1.00	.02
Model 4	6.24	4	1.20	1	.96	.83	.94	.95	.11
Model 5	7.27	4	0.17	1	.95	.81	.92	.93	.13
Model 6	4.75	3	2.69	2	.96	.82	.96	.96	.11
Model 7	3.50	3	3.94	2	.97	.86	.99	.99	.06
Model 8	5.34	4	2.10	1	.96	.85	.97	.97	.08
Model 9	5.99	3	1.45	2	.95	.75	.93	.94	.14

Note. Model 1 was a null model specifying no covariance among any of the measures. Model 2 added a direct path from leader–member exchange (LMX) to safety commitment. Model 3 added a direct path from LMX to accidents. Model 4 added a direct path from perceived organizational support (POS) to safety commitment. Model 5 added a direct path from POS to accidents. Model 6 added a direct path from both POS and LMX to safety commitment. Model 7 added a direct path from both POS and LMX to accidents. Model 8 added a direct path from safety communication to accidents. Model 9 specified direct paths from both POS and LMX to safety communication, safety commitment, and accidents, with no paths specified among the three safety-related measures (i.e., the safety-related measures were treated as three independent outcomes, each predicted by POS and LMX). GFI = goodness-of-fit index; AGFI = adjusted goodness-of-fit index; CFI = comparative fit index; IFI = incremental fit index; RMSEA = root-mean-square error of approximation.
[a] $p_{\text{diff}} < .01$ for Model 1 and *ns* for all other models.

zational tenure into the structural model as a direct effect on accidents. The results indicated that the relationship between safety commitment and accidents was not appreciably altered. Specifically, the parameter estimate was reduced from −.30 to −.26 and was still significant ($p < .05$, one-tailed).

The second additional analysis attempted to investigate the degree to which accidents were disproportionately related to certain aspects of the manufacturing process. Although the technology that the group leaders dealt with was mostly similar (i.e., manual assembly line work), there could have been systematic differences across technologies influenced our results. For those group leaders who had experienced an accident, we were able to identify the department or production line to which they were assigned. A one-way analysis of variance indicated than any minor variations in technology across group leaders was not significantly related to accidents, $F(6, 18) = 0.356$, *ns*.

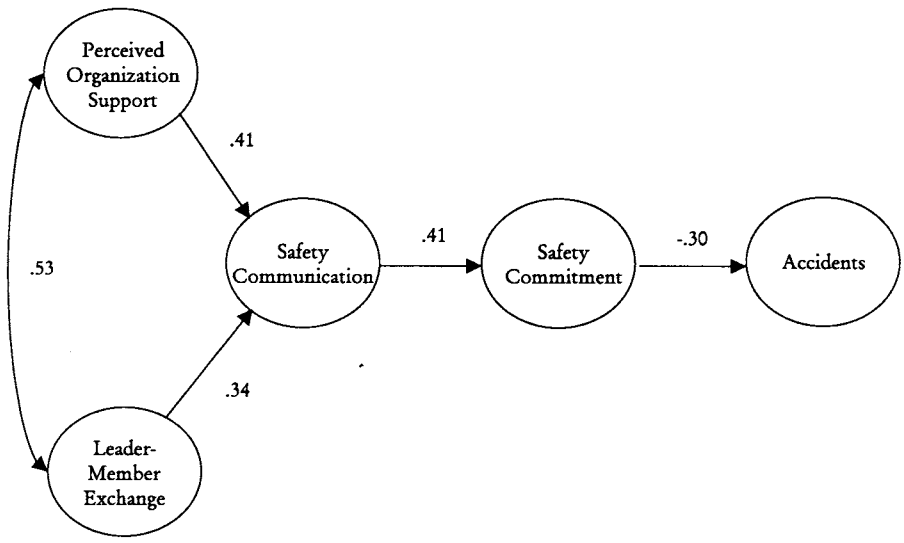

Figure 2. Hypothesized model with path coefficients. All structural paths are significant ($p < .05$, one-tailed; $N = 49$). Standardized structural parameters are reported.

Discussion

To integrate the safety and organizational literatures, the present study adopted a social exchange perspective linking POS and LMX to safety-related behaviors and accidents. The findings revealed that POS was significantly related to safety communication, and that LMX was significantly related to safety communication, safety commitment, and accidents. In addition to these bivariate relationships, the results provided evidence suggesting that safety communication and safety commitment mediated the relationship between POS and LMX and accidents. These findings have implications for safety as well as for POS and LMX research.

Implications for Safety

Both engineers and social scientists have become increasingly interested in the role that larger organizational factors play in the safety arena (e.g., Donald & Canter, 1994; Embrey, 1992; Hofmann et al., 1995; Hofmann & Stetzer, 1996, 1998; Hurst et al., 1991; Wright, 1986). In the current study, we identified POS and LMX as two constructs that capture the quality of the relationships that employees have with their organization and leader, respectively. The present findings suggest that employees who perceive the organization as supportive and those that have high-quality relationships with their leader are more likely to feel free to raise safety concerns. Such safety-related communication, in turn, is related to safety commitment and, ultimately, the frequency of accidents.

This suggests that it is important for organizations to engage in actions that convey their support for their employees. Because an employee's direct supervisor is often the individual who conveys these messages (see Levinson, 1965), it is critical for senior management to convey this support to managers who, in turn, can act as a conduit for support at the employee level. In addition, the results suggest that organizations should encourage the development of effective exchange relationships between supervisors and subordinates. Positive exchange relationships are more likely to engender a context within which members will raise safety concerns, which, in the long run, can lead to the identification and implementation of safety programs.

The results regarding safety-related communication can also be viewed in light of recent research investigating the relationship between safety communication and accident attributions. Hofmann and Stetzer (1998) found that employees working in climates that did not encourage or reinforce safety-related communication were less likely to attribute the cause of an accident to a fellow worker—even though there was clear evidence suggesting that the worker was at fault. Integrating the current results with those of Hofmann and Stetzer (1998) suggested that actions aimed at altering perceptions of POS and facilitating high-quality LMXs might not only lead to increased safety-related communication but also encourage more realistic assessments of accident causes.

Implications for POS and LMX

Recent research has begun investigating POS and LMX simultaneously (Settoon et al., 1996; Wayne et al., 1997), because of their common foundation of social exchange. Our findings indicate that both POS and LMX jointly predict safety-related communication. This finding is in keeping with research suggesting that employees direct their reciprocating actions toward the target from which benefits accrue (e.g., Settoon et al., 1996; Wayne et al., 1997). In particular, engaging in safety-related communication should be beneficial to both the organization and the employee's leader. It benefits the organization by helping management identify problems and develop effective countermeasures, thereby reducing accident-related costs. This type of communication can also benefit the employee's leader. Specifically, in many organizations where jobs have direct safety implications, part of the performance evaluation of leaders is the safety record of their subordinates. Thus, raising these concerns not only helps the leader better manage safety problems and improve the safety record of the work group, but also improves the perceptions of the leader's performance.

The findings of the current study also have implications for LMX theory. In particular, one of the findings in recent reviews of the LMX literature (e.g., Gerstner & Day, 1997; Liden et al., 1997) is that high-quality exchange relationships are more predictive of subjective outcomes than of more objective outcomes (e.g., objective performance). Effective exchange relationships in the current study, however, were linked to both subjective (i.e., safety communication and commitment) as well as more objective outcomes (i.e., actual accidents). Given these findings, future LMX research should further investigate the relationship between effective exchange relationships and nontraditional objective performance indicators, such as safety and quality.

Strengths and Limitations of the Current Study

The current study has two main strengths. First, three different data sources were used (i.e., supervisor, group leader, and archival) thereby eliminating the possibility that common method effects were responsible for the findings. In particular, group leaders provided the measures of POS, LMX, and safety communication; their supervisors provided the measure of safety commitment; and accidents were obtained from archival records. Second, the study

related POS and LMX to an outcome variable (i.e., accidents) that heretofore has not been investigated.

These strengths notwithstanding, the current study does have three potential weaknesses. First, the model only included five core variables, and all of the survey measures were collected at one point in time. Given that we only had a single administration of the survey, we were unable to investigate how these forms of social exchange emerge and develop over time (Bauer & Green, 1996), which limits the extent to which we can make definitive claims about causal processes. In addition, because the model included a relatively small set of core variables, future research should include a wider variety of variables to assess how the current constructs fit into a larger nomological network.

The second weakness was that our measure of accidents was obtained from organizational records and may be subject to a reporting bias. In other words, it may be the case that certain group leaders chose not to report minor accidents to the organization. However, it seems that the group leaders who are most reluctant to report minor injuries to the organization are also those who do not believe that the organization supports and values them, who have less positive relationships with their supervisor, and who feel the organization (or their supervisor) is not receptive to the raising of safety concerns (see, e.g., Edmondson, 1996). If this type of reporting bias existed, it should work to attenuate the relationships of POS and LMX with safety-related communication with accidents. The rationale is that those individuals with high POS, LMX, and safety-related communication actually have fewer accidents, and those with low POS, LMX, and safety-related communication underreport accidents, resulting in range restriction on the archival accidents, thereby attenuating the correlations. Given the significant negative relationships between POS–LMX and safety communication with accidents, it does not appear as though this type of bias significantly influenced the results.

The third potential weakness of the current study is the relatively small sample size. It should be recalled, however, that these group leaders are the primary linking pin between management and workers in an organization employing 1,200 production employees. As such, the nature of their relationship with the supervisors and the organization are particularly critical. Thus, although the sample is small, the practical implications of the results for this organization are significant. This notwithstanding, the small sample size raises two data-analytic questions.

The first question centers around the maximum-likelihood estimates and whether the significance tests associated with these parameter estimates are appropriate for small sample sizes. Anderson and Gerbing (1988) explicitly addressed this when they noted that

> although the bias in parameter estimates is of no practical significance for sample sizes as low as 50, for a given sample, the deviations of the parameter estimates from their respective population values can be quite large . . . [which] does not present a problem in statistical inference, because the standard errors computed by the LISREL program are adjusted accordingly. (p. 415)

This suggests that the estimates for the current model are accurate and do allow us to make the kinds of inferences made earlier.

The second question regards the overall assessment of model fit. There is much research that demonstrates some overall fit indexes are biased by sample size (e.g., Bentler, 1990; La Du & Tanaka, 1989; Marsh, Balla, & McDonald, 1988). In general, this research suggests overall fit indexes are positively correlated with sample size. For example, La Du and Tanaka (1989) found that values of GFI increased with sample size (see their Study 1; see also Marsh et al., 1988), and, more recently, Bentler (1990) concluded that the CFI and IFI perform well even with sample sizes as small as 50. Our hypothesized model produced GFI, CFI, and IFI values of .95, .94 and .95, respectively. This provides further evidence that the hypothesized model fit the data well. Although a larger sample size would have provided greater power to detect small differences between competing models, the weight of the empirical evidence, coupled with the theoretical foundation, suggests that the hypothesized model provided the best fit to the data and theory.

Conclusion

In sum, the results of the current study have important implications for both organizational researchers and safety researchers and practitioners. It appears that the support organizations show for their employees and the quality of exchange relationships with supervisors are associated with safety-related communication. This safety-related communication is significantly related to safety commitment, which ultimately is predictive of accidents. These findings suggest that the nature of social exchanges in organizations plays an important role in understanding safety-related behaviors and accidents. With respect to safety management systems in organizations, our findings suggest that the messages organizations send to their employees and the nature of leader–member relations play an important role in ensuring employee safety.

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